

ATTACHMENT BOOKLET

ORDINARY COUNCIL MEETING
28 JUNE 2023

BOOK 2

CONTENTS

PAGE

**PLAN 02 PLANNING PROPOSAL REQUEST TO AMEND DEVELOPMENT
STANDARDS IN THE LIVERPOOL LOCAL ENVIRONMENTAL
PLAN 2008 AT 368-370 COWPASTURE ROAD, MIDDLETON
GRANGE**

<i>Attachment 1 Applicant Prepared Planning Proposal Report 368-370 Cowpasture.</i>	<i>199</i>
<i>Attachment 2 Traffic Report September 2022</i>	<i>276</i>
<i>Attachment 3 Economic Report.....</i>	<i>290</i>
<i>Attachment 4 Conceptual Plans</i>	<i>314</i>
<i>Attachment 5 Existing Site Plan</i>	<i>315</i>
<i>Attachment 6 Peer Reviewed Preliminary Site Investigation</i>	<i>316</i>
<i>Attachment 7 Local Planning Panel Report 368-370 Cowpasture Road.....</i>	<i>355</i>
<i>Attachment 8 Local Planning Panel Minutes</i>	<i>374</i>

OPER 02 INTEGRATED PEST MANAGEMENT POLICY AND STRATEGY

<i>Attachment 1 Integrated Pest Management Policy.....</i>	<i>377</i>
<i>Attachment 2 Integrated Pest Management Strategy</i>	<i>383</i>
<i>Attachment 3 Integrated Pest Management Strategy – Appendix D Matrix of Rationale for Pest Species Inclusion</i>	<i>544</i>
<i>Attachment 4 Feedback received on the Integrated Pest Management Policy and Strategy and Responses</i>	<i>554</i>

CTTE 01 LIVERPOOL LOCAL TRAFFIC MEETING HELD ON 17 MAY 2023

<i>Attachment 1 Liverpool Traffic Committee Minutes 17 May.....</i>	<i>556</i>
<i>Attachment 2 Local Traffic Committee Attachment Booklet.....</i>	<i>591</i>



Property and Infrastructure Specialists

PLANNING PROPOSAL APPLICATION TO AMEND LIVERPOOL LOCAL ENVIRONMENTAL PLAN 2008



368 – 370 Cowpasture Road, Middleton Grange

November 2021 (revised March 2023)



No reproduction of this document or any part thereof is permitted without prior written permission of APP Corporation Pty Limited.

This report has been prepared and reviewed in accordance with our quality control system. The report is a preliminary draft unless it is signed below.

This report has been prepared by: Jaime McNamara (Urban Planner)

This report has been reviewed by: Josh Owen (Principal Planner)

© Copyright APP Corporation
ABN: 29 003 764 770

All rights reserved. No material may be reproduced without prior permission.

While we have tried to ensure the accuracy of the information in this publication, the Publisher accepts no responsibility or liability for any errors, omissions or resultant consequences including any loss or damage arising from reliance in information in this publication.

Contents

PLANNING PROPOSAL	1
APPLICATION TO AMEND LIVERPOOL LOCAL ENVIRONMENTAL PLAN 2008	1
1. Introduction	6
1.1 Overview	6
1.2 Objective and Purpose	7
1.3 Proposed LEP Amendments	8
1.4 Supporting Documentation	9
2. Background	10
2.1 Pre-Lodgement Consultation Summary	10
2.2 Employment Generation	10
3. Site Analysis	12
3.1 Site Description and Location	12
3.2 Surrounding Development and Context	14
3.3 Access and Transport	17
3.4 Utility Infrastructure	19
3.5 Landscaping, Native Vegetation and Biodiversity	19
3.6 Bushfire and Flooding Conditions	19
3.7 Community Infrastructure	19
3.8 Surrounding B6 Zoned Sites	20
4. Planning Context	21
4.1 Strategic Planning Framework	21
4.2 Statutory Planning Considerations	34
5. Proposed Amendments	39
6. Planning Proposal	44
Part 1 - Statement of the objectives of intended outcomes of the proposed amendment	44
Part 2 - Explanation of the provisions that are to be included in the proposed amendment	45
Part 3 - Justification for those objectives, outcomes and the process for their implementation	45



Question 1 - Is the planning proposal a result of an endorsed local strategic planning statement, strategic study or report?	46
Question 2 - Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?	47
Section B - Relationship to strategic planning framework	47
Question 3 - Will the planning proposal give effect to the objectives and actions of the applicable regional, or district plan or strategy (including any exhibited draft plans or strategies)?	47
Question 5 - Is the planning proposal consistent with applicable State Environmental Planning Policies?	49
Question 6 - Is the planning proposal consistent with applicable Ministerial Directions (s.9.1 directions)?	53
Question 7 - Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?	56
Question 8 - Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?	56
Question 8 - Has the planning proposal adequately addressed any social and economic effects?	57
Question 9 - Is there adequate public infrastructure for the planning proposal?	57
Question 10 - What are the views of state and Commonwealth public authorities consulted in accordance with the Gateway determination?	58
Part 4 - Supporting maps which identify the aspects of the Planning Proposal	58
Part 5 - Details of community consultation that is to be undertaken for the Planning Proposal	58
Part 6 - Project Timeline	58
7. Conclusion	60

Contents

List of Appendices

- 1.1.1 Appendix A. Site Survey**
- 1.1.2 Appendix B. Preferred Concept Plan (Revised)**
- 1.1.3 Appendix C. Amended Zoning Map**
- 1.1.4 Appendix D. Amended Height of Buildings Map**
- 1.1.5 Appendix E. Amended FSR Map (Revised)**
- 1.1.6 Appendix F. Existing Site Plan (Updated)**
- 1.1.7 Appendix G. Economic Impact Assessment (Updated)**
- 1.1.8 Appendix H. Detailed Site Investigation**
- 1.1.9 Appendix I. Traffic Report (Updated)**
- 1.1.10 Appendix J. Preliminary Site Investigation**



1. Introduction

1.1 Overview

This Planning Proposal report has been prepared by APP Corporation Pty Ltd (APP) and is submitted to Liverpool City Council (Council) on behalf of Cowpasture Road (2005) Pty Ltd, the owner of the property at 368-370 Cowpasture Road, Middleton Grange (the site) (refer to Figure 1 overleaf). It seeks to initiate amendments to the *Liverpool Local Environment Plan 2008* (Liverpool LEP 2008) to enable the future orderly development and continued use of the site for a diverse range of commercial activities by:

- Rezoning the land to B6 Enterprise Corridor;
- Increase the maximum height of building standard from 8.5m to 15m; and
- Increase the maximum floor space ratio (FSR) standard from 0.65:1 to 0.75:1.

This Planning Proposal explores the site's future flexibility to shift and respond with market conditions, without posing competition to existing town centres and neighbourhood shops within the vicinity of the site. Despite its current zoning, the site is not suitable for residential development due to constraints, including its proximity to a classified road.

The site is currently zoned R1 General Residential pursuant to the Liverpool LEP 2008 and is subject to a maximum building height provision of 8.5m under Clause 4.3 and a maximum FSR of 0.65:1 under Clause 4.4. The site contains an existing BP service station, Pizza Hut and KFC restaurant which are inconsistent with the objectives and land use intent of the R1 zoning of the land under the LEP. The uses presently on site are permitted as additional permitted uses under Schedule 1 Clause 9 of the Liverpool LEP 2008. A rezoning of the site sought under this Planning Proposal will bring the zoning of the site into alignment with the current land use activities at the site, whilst accommodating the potential for new development to be achieved, being a specialised retail premises, generating local employment opportunity and service offerings.

The site has a large frontage to Cowpasture Road and is in proximity to the northern on-ramps and southbound exit ramps of the M7 Motorway. The site is positioned almost equal distance between the Carnes Hill Shopping Centre to the south and developed industrial Len Waters Estate to the north, although it is predominantly surrounded by residential neighbourhoods. It benefits from vehicular access via Cowpasture Road. This highlights the site's suitability for commercial uses linked to main road trading including service stations and highway service centres, food and drink premises, retail, commercial and other business premises. The site has a total area of 4,500m², making it one of the largest remnant holdings in the suburb of Middleton Grange, capable of supporting a range of business uses and main road trading activities consistent with the nature of existing operations.

The *Liverpool Local Strategic Planning Statement* (the Liverpool LSPS) and supporting economic land use studies have confirmed the need for 500-1,000 new jobs in the suburb of Middleton Grange to 2036 to support the continued population growth associated with residential land release and in-fill



development across the surrounding areas. The limited availability of suitable sites to accommodate employment generating activities in these areas highlights the sites suitability for rezoning. Modest increases to the permitted maximum height of buildings and floor space ratio standards outlined in this report will enable the orderly and viable redevelopment of the site to accommodate new retail, commercial and service-based jobs which will contribute towards local employment targets. Additionally, a maximum building height of 15m and maximum FSR of 0.75:1 is consistent with surrounding B6-zoned sites.



Figure 1 Site location (Source: Six Maps)

1.2 Objective and Purpose

The objective of this Planning Proposal is to facilitate additional employment generating uses and job diversity in addition to what is currently provided for on the site.

The current development standards and zoning parameters greatly constrain the sites' continued use and viability of future redevelopment and improvements. A rezoning of the site envisaged under this Planning Proposal aligns with several strategic objectives and planning priorities outlined in Council's



LSPS, employment strategies and higher order strategic plans including the Greater Sydney Region Plan and the Western City District Plan.

Modest uplift to the applicable maximum height of buildings and floor space ratio development standards under the Liverpool LEP 2008 will also facilitate an appropriate scale of building typologies to expand the sites commercial activity under the proposed rezoning.

This revised Planning Proposal is supported by an indicative concept plan prepared by Mosca Pserras Architects, included in Section 5 and Appendix B (Revised). The concept plan includes a 3,375m² two storey building with on-site parking at the ground floor.

1.3 Proposed LEP Amendments

This Planning Proposal has been prepared to initiate a change in land use permissibility to enable the provision of employment generating land uses on the site. The Planning Proposal seeks to amend the Liverpool LEP 2008 in the following ways:

- Rezone the site from R1 General Residential to B6 Enterprise Corridor. This will require an amendment to Liverpool LEP Zoning Map_008.
- Amend the Liverpool LEP 2008 Height of Buildings Map_008 to apply a maximum building height control of 15m in place of the existing 8.5m control. A 15m building height control would accommodate a 2-3 storey development.
- Amend the Liverpool LEP 2008 Floor Space Ratio Map_008 to apply a maximum floor space ratio control of 0.75:1 in place of the existing 0.65:1 control.

Figures 17 to Figure 19 of this report provide excerpts of the proposed changes to the relevant Liverpool LEP 2008 maps. The complete suite of amended Liverpool LEP 2008 maps is included at Appendix C, Appendix D and Appendix E (Revised).

As part of the current Department of Planning, Industry and Environment (DPIE) planning reforms, the B6 zone will be converted to a new E3 Productivity Support zone and will be implemented over the next twelve (12) months from December 1 2021. This zone seeks to better support state and local strategic planning, increase investment, and boost jobs growth and will be characterised by a mix of industrial, commercial creative, warehousing and emerging new industries that need larger floor space. The E3 zone is aligned to the aims and objectives of the B6 zone, as well as the purpose and objectives of this Planning Proposal.



1.4 Supporting Documentation

This Planning Proposal should be read in conjunction with technical material listed in Table 1 below.

Table 1 Supporting Consultant Inputs

Appendix	Technical Material	Prepared By
A	Survey Plan	Mosca Pserras Architects
B	Preferred Concept Plan (Revised)	Mosca Pserras Architects
C	Amended Zoning Map (LZN_008)	APP Corporation Pty Ltd
D	Amended Height of Buildings Map (HOB_008)	APP Corporation Pty Ltd
E	Amended Floor Space Ratio Map (FSR_008) (Revised)	APP Corporation Pty Ltd
F	Existing Site Plan (Updated)	Mosca Pserras Architects
G	Economic Impact Assessment	HillPDA
H	Detailed Site Investigation	Douglas Partners Pty Ltd
I	Traffic Report	CBRK
J	Preliminary Site Investigation	Aargus Pty Ltd, Peer Reviewed by Miguel Zavaleta- Romera cEnvP Certified No. 945

This Planning Proposal has been prepared pursuant to the provisions of Division 3.2 of the Act and in accordance with the Department of Planning's *A Guide to Preparing Planning Proposals 2018*. It considers the strategic and site-specific merits of the proposed LEP amendments in the context of the relevant State and local planning policies, includes relevant mapping changes and a timeline to completion of the application. This report concludes that the proposed changes to the zoning and development parameters are modest and in line with the existing and future use of the site and main road character. It will facilitate higher order employment generating uses on the site and contribute towards the achievement of local job targets outlined in Council's LSPS. Accordingly, the Planning Proposal is worthy of support from Liverpool City Council and the DPIE.



2. Background

2.1 Pre-Lodgement Consultation Summary

Initial consultation with Council was conducted in July 2020 as part of Council's Phase 1 LEP Review (Amendment 82). APP prepared a submission on behalf of the owner of the site, Cowpasture Road (2005) Pty Ltd, requesting inclusion of the proposed changes to zoning controls and development standards applied to the site in the Council-led Planning Proposal.

The submission prepared by APP to the Liverpool LEP Review recommended that the site be rezoned to B6 Enterprise Corridor to better classify the existing use and development. The submission also put forth moderate uplifts to height and FSR standards, in-line with nearby B6 zoned sites. Proposed changes to development controls included a minimum FSR of 0.75:1 and building height of 15m with the intent to attract businesses and encourage revitalisation of the site.

As part of Council's reporting to the Ordinary Meeting of Council in August 2020, the request to rezone the site from R1 General Residential to B6 Enterprise Corridor was acknowledged yet could not be facilitated in the required timeframes. As a result, Council recommended the preparation of a proponent-led Planning Proposal as a more appropriate means of seeking the requested changes to zoning controls and development standards.

2.2 Employment Generation

The Planning Proposal is supported by an Indicative Concept Plan, prepared by Mosca Pserras Architects. Under the Concept Plan, the existing uses at the site are to be replaced by a specialised retail premises. This use would have economic benefits during construction and post-construction, and effectively serve a different function in the retail and commercial hierarchy compared to the larger centres at Middleton Grange Village / Town Centre, Carnes Hill Town Centre, Austral Town Centre and Hoxton Park.

Based on current market research, it is estimated that the site currently provides a total of sixty (60) full-time and part-time jobs, including:

- Ten (10) full-time and part-time jobs associated with the service station and convenience store;
- Twenty (20) full-time and part-time jobs associated with the Pizza Hut restaurant; and
- Thirty (30) full-time and part-time jobs associated with the KFC restaurant.

This Planning Proposal is supported by an Economic Impact Assessment (EIA) prepared by HillPDA and included in Appendix G. The EIA assessed the proposed economic development of the Planning Proposal based on the preferred concept. The following employment generation assumptions are provided for the construction and post-construction phase:

- One hundred and six (106) direct and indirect jobs created and supported during the construction phase; and
- Fifty-two (52) jobs provided, post-construction.



The proposed development would have additional economic benefits discussed further in this report and is considered to constitute a more orderly and efficient use of the land, aligned with the existing uses on site and the State planning objectives to deliver additional employment generating uses and support growth.



3. Site Analysis

3.1 Site Description and Location

The site subject of this Planning Proposal is legally identified as Lot 4 in DP 1052704, 368-370 Cowpasture Road, Middleton Grange. The site contains an existing BP service station and Pizza Hut restaurant in the northern portion (see Figure 3) of the site and a separate KFC restaurant in the southern portion of the site (see Figure 4). It has a total approximate land area of 4,500m² and a 79m frontage to Cowpasture Road along its eastern boundary.

The site is located on the western side of Cowpasture Road, which is a State classified arterial road. It has two direct points of access for vehicles from Cowpasture Road and no direct access from the adjoining residential streets, including Mustang Close to the south or Parer Avenue to the north. The site is positioned 220m south of Qantas Boulevard (Sixteenth Avenue East), 500m south of the Westlink M7, 100m north of Fifteenth Avenue / Hoxton Park Road, 4.3km north-west of the M5 South Western Motorway and 1.4km north of the Carnes Hill Town Centre.

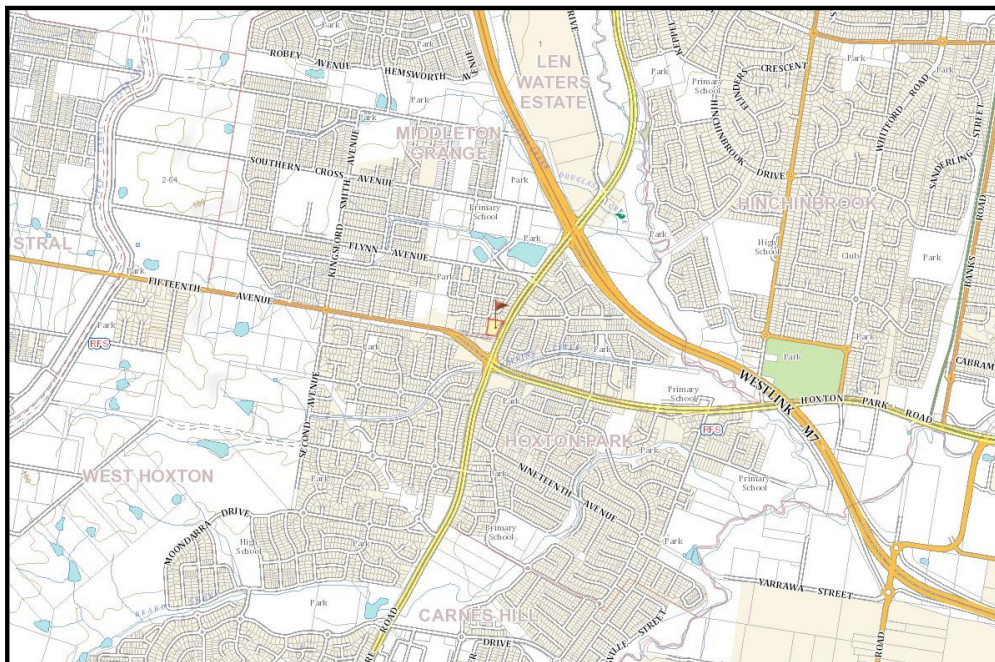


Figure 2 Site within surrounding context (Source: SIX Maps)

PLAN 02 Planning Proposal request to amend development standards in the Liverpool Local Environmental
Plan 2008 at 368-370 Cowpasture Road, Middleton Grange
Attachment 1 Applicant Prepared Planning Proposal Report 368-370 Cowpasture



The site survey is included in Appendix A. The existing site plan prepared by Mosca Pserras Architects is included in Figure 3 and Appendix F. Views of the site are included in Figure 4 to Figure 6. Key site features are also summarised in Table 2, below:

Table 2 Site Description

Feature	Description
Street Address	368-370 Cowpasture Road, Middleton Grange
Legal Description	Lot 4 in DP 1052704
Site Area	4,500m ²
Site Dimensions	79m street frontage to Cowpasture Road x 49m-71m depth
Topography	Parallel to Cowpasture Road, the site declines slightly from north to south (RL 45-47 to RL 41-44, generally) From the Cowpasture Road frontage to the rear of the site, the site inclines slightly from east to west (RL 41-45 to RL 44-47, generally)
Other Features	Separate entry (to the south) including left turn-in lane only and exit point (to the north) including merge right lane connecting to Cowpasture Road Pedestrian footpath lining Cowpasture Road frontage to the north and south of the site, connecting to surrounding residential areas including direct access to Mustang Close Minor landscaping of setback to the northern and western site boundaries interfacing residential neighbours Ornamental hedging lining KFC restaurant drive through and entry Existing parking including 10 spaces lining the front (south) of service station, convenience store and Pizza Hut, in addition to parking at fuel bowsers 5 spaces attached to the front (north) of the KFC Restaurant, in addition to drive-through area Approximately 27 spaces lining the west and north-west boundary interface at rear of site Delivery and waste collection area west of the Pizza Hut restaurant

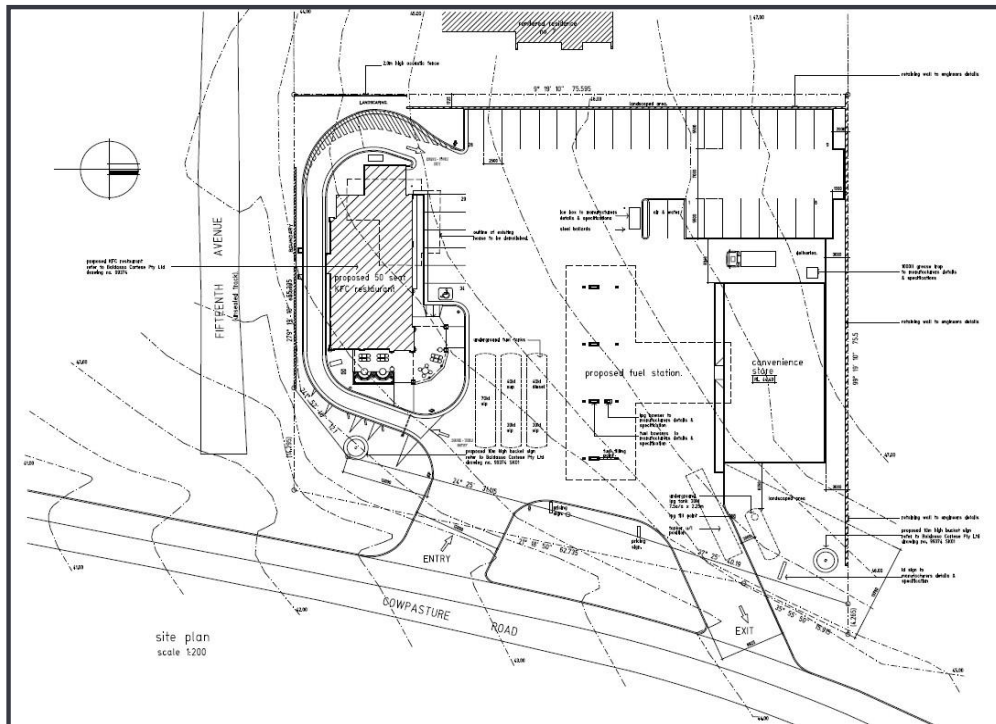


Figure 3 Existing Site Plan (Source: Mosca Pserras Architects)



Figure 4 View of the northern portion of the site containing the BP Service Station and Pizza Hut restaurant (Source: Google Maps)



Figure 5 View of the southern portion of the site containing KFC restaurant (Source: Google Maps)



Figure 6 View of service station, convenience store and Pizza Hut restaurant frontage (Source: Google Maps)

3.2 Surrounding Development and Context

The surrounding areas of Middleton Grange, Carnes Hill and Hoxton Park are characterised as predominantly low-density residential neighbourhoods with limited retail, commercial and industrial activities. The site is the only property along Cowpasture Road having direct frontage and access to the arterial road. Whilst residential zoned properties exist to the north and south along the road, they are separated typically by large acoustic barriers and landscape treatments. Most of the residential areas lie to the west of the site.



There are three detached dwellings adjoining the sites northern boundary located at 1-5 Fysh Avenue, as well as a 1 storey detached dwelling located parallel to the sites western boundary located on 47 Parer Avenue (refer to Figures 7 and 8).



Figure 7 Three residential dwellings adjoining the site at 1-5 Fysh Avenue (Source: Google Maps)



Figure 8 Residential dwelling adjoining the site at 47 Parer Avenue (Source: Google Maps)

Further to the east on the opposite side of Cowpasture Road is an established low density residential area also characterised by 1 to 2-storey detached dwellings and dual occupancies. No direct access to the road is available to these adjacent residential properties.

The Hinchinbrook Zone Substation is located directly to the south of the site and an Anytime Fitness Gym is located directly to the south-west on Mustang Close.

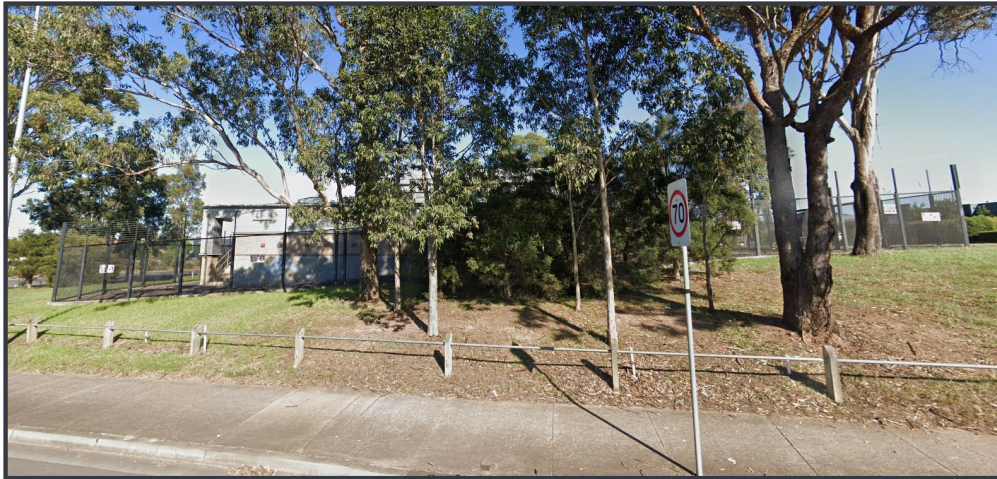


Figure 9 View of the Hinchinbrook Zone Substation from Cowpasture Road (Source: Google Maps)



Figure 10 View of the Anytime Fitness Gym from Mustang Close (Source: Google Maps)

The site is a prominent feature in the surrounding landscape, serving as a key pit stop for motorists and local convenience offering for local residents. It is located approximately 6.5km west of Liverpool Central Business District (CBD), 18.5km south-west of Parramatta CBD and 33.3km west of Sydney CBD. Cowpasture Road provides an important regional connection to the Westlink M7 and M5 South Western Motorway and as such, the site is well utilised by commuters and freight vehicles throughout the day.



3.3 Access and Transport

Vehicular and pedestrian access to the site is via Cowpasture Road which aligns the eastern boundary frontage. All vehicular traffic enters the site via the southern driveway and leaves in a forward direction on to Cowpasture Road from the exit-only northern driveway as shown on the Existing Site Plan in Figure 5 and included in Appendix F. The vehicular entrance and exit points to the road are clearly marked and wide enough to accommodate access and manoeuvring by large trucks.

The site is accessed at a district level via road infrastructure including:

- Qantas Boulevard (Sixteenth Avenue East) to the north;
- Westlink M7 to the north;
- M5 South Western Motorway to the south-east;
- Fifteenth Avenue and Hoxton Park Road to the south; and
- Camden Valley Way to the south.

Numerous bus routes service Cowpasture Road, including Route 853 Carnes Hill to Liverpool via Hoxton Park, providing local connections between the site and local and regional centres. Liverpool Train Station is located 7.2km east of the site, connecting to local and regional rail corridors. Planned transport infrastructure including trackless trams are proposed to operate along Hoxton Park Road nearby to the south of the site which will connect it to Liverpool and the emerging Western Sydney Airport and Aerotropolis.

Internal vehicular site access includes numerous driveways and hardstand turning and parking areas. The site layout was originally designed having regard to the traffic volumes anticipated along Cowpasture Road. It ensures that vehicular traffic can easily access and park close to the entrances of the take-away restaurants and within the service station (see Figure 11).



Figure 11 Internal site driveways and hardstand manoeuvring and parking areas (Source: Google Maps)



A footpath running along the frontage to Cowpasture Road provides access for pedestrians into the site (see Figure 12). Internally, demarked crossings and pedestrian priority zones which are shared with slow moving traffic ensures safe access for pedestrians into each of the convenience services.



Figure 12 Existing footpath along Cowpasture Road (Source: Google Maps)

A footpath along the northern side of Mustang Close to the south of the site also provides informal pedestrian access via the rear driveway of the KFC restaurant as shown in Figure 13.



Figure 13 Existing footpath along Cowpasture Road (Source: Google Maps)



3.4 Utility Infrastructure

The site is currently connected to and serviced by the following utility infrastructure:

- Mains water;
- Mains sewerage;
- Underground electricity network; and
- Telecommunications (NBN).

3.5 Landscaping, Native Vegetation and Biodiversity

Owing to the location of the site and existing uses existing on-site landscaping is limited to minimal landscaping, ornamental hedging around the northern and western boundaries interfacing to residential properties and small garden beds. Low hedging also exists along the southern edge at the interface to Mustang Close and the adjoining Anytime Fitness. Whilst limited in total area, existing on-site landscape features are well maintained.

The site does not comprise any protected or significant biodiversity or native flora and fauna. Small to medium sized trees are scattered along the boundaries of the site and provide no real opportunities for nesting or feeding for native birds.

More significant trees are located in the adjoining residential areas and some of the surrounding neighbourhood streets further to the west and north-west. The subject site comprises largely hardstand concrete areas.

The site does not contain, nor is it located near to any natural watercourse or body of water. The site is not mapped as Environmentally Significant Land.

3.6 Bushfire and Flooding Conditions

The site is not mapped as being Bushfire Prone Land or land impacted by stormwater or river flooding.

3.7 Community Infrastructure

The site is located within a 5km of several community facilities, civic and educational institutions, including:

Schools

- Thomas Hassall Anglican College Middleton Grange Public School
- Hinchinbrook Public School Hoxton Park High School
- Good Samaritan Catholic College
- Good Shepherd Catholic Primary School Malek Fahd Islamic School
- Hoxton Park Public School Clancy Catholic College



Universities and TAFE

- Western Sydney University – Liverpool University of Wollongong – Liverpool TAFE NSW Liverpool
- TAFE NSW Miller

Civic

- Liverpool City Library Liverpool Police Station Liverpool Court House

Health

- Liverpool Hospital

Other

- Hoxton Park Anglican Church Australian Christian Fellowship The Church in Liverpool

3.8 Surrounding B6 Zoned Sites

The subject site is located within close proximity to a number of B6 Enterprise Corridor sites featuring consistent maximum building height and FSR controls sought under this planning proposal. Surrounding B6 sites with a maximum building height of 15m and maximum FSR of 0.75:1, include:

- 402 Hoxton Park Road, Prestons
- 525 Cowpasture Road, Len Waters Estate
- 501 Cowpasture Road, Len Waters Estate
- 505 Cowpasture Road, Len Waters Estate
- 515 Cowpasture Road, Len Waters Estate
- 525 Cowpasture Road, Len Waters Estate
- 535 Cowpasture Road, Len Waters Estate
- 4-8 Lyn Parade, Prestons
- 274-276 Hoxton Park Road, Prestons
- 264-272 Hoxton Park Road, Prestons
- 246 Hoxton Park Road, Prestons



4. Planning Context

4.1 Strategic Planning Framework

4.1.1 Greater Sydney Region Plan

A Metropolis of Three Cities establishes the overarching strategic vision for the provision of infrastructure, liveability, productivity and sustainability in line with Greater Sydney's projected population and economic growth. The plan identifies three cities within the Metropolis- including the emerging Western Parkland City for which the subject site resides within.

Strongly driven by new city-shaping infrastructure investment, such as the Western Sydney Airport, the Western Economic Corridor within the Parkland City is earmarked to contribute to a strong trade, freight, logistics, advanced manufacturing, health, education and science economy. The Western City will include expansive industrial and urban services land, supported by new freight links and an expanded motorway network and the Western Sydney Airport.

The site is located within the urban area to the west of the Liverpool Metropolitan Cluster, home to the Liverpool Innovation Precinct consisting of hospitals, allied health, educational, civic facilities and a range of community services. It is positioned on the western side of an important north-south collector road which connects into the major arterial network and is on the eastern edge of the Western Economic Corridor.

The following productivity directions and objectives from the Greater Sydney Region Plan are relevant to the Planning Proposal:

- **Jobs and Skills for the City**
 - Greater diversity of job choice to enable required employment growth and number of new jobs across the Western Parkland City.
 - Supporting employment growth with access to freight rail and major road corridors to better improve connections, integration between industries and business innovation.
- **Integrated Land Use and Transport**
 - Drive opportunities for investment and business across the city and support a diverse economy.
 - Deliver the 30-minute city and strengthen the viability of existing and future planned economic corridors along main roads and rail lines.
 - Centre-serving corridors accommodating turn-up and go access to services.
- **Investment and business activity in Centres**
 - Jobs are closer to homes and optimising transport corridors to provide improved access to employment opportunities
 - Increased collaboration and productivity drive by business agglomerations
 - Significant demand for emerging retail and commercial lands – particularly in the Western Parkland City
 - Local centres play an important role in providing access to goods and services close to where people live

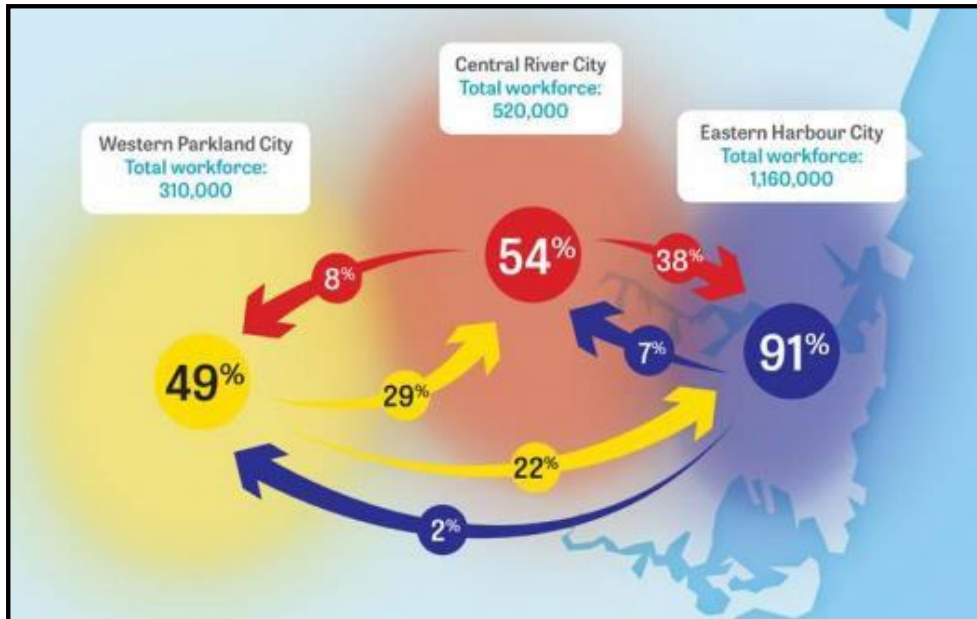


Figure 14 Distribution of resident workforce 2016 (Source: GSC)

The proposed changes to land use zoning, FSR and maximum building height will provide greater flexibility in existing and proposed site uses and employment opportunities. The proposed amendments to the Liverpool LEP 2008 will facilitate the retention of the existing on-site service station, convenience store and takeaway food outlets, whilst allowing future permissible development in the form of additional commercial space.

Changes to these controls align with Greater Sydney Region Plan objectives through improved provision of local business offerings and employment opportunities within the Western Parkland City. Locally, this Planning Proposal will contribute to the attainment of a 30-minute city by providing local employment opportunities for residents of Middleton Grange and surrounding areas. With reference to Figure 14, this will reduce the need for the Western Parkland City workforce to travel to the Central River City or Eastern Harbour City for employment opportunities.



4.1.1 Western City District Plan

The site is located within the Western City District of Greater Sydney. The Western City District Plan reflects the broader vision of Sydney as a three-city metropolis. The Western City District is earmarked to experience a once-in-a-generation economic boom, bringing together infrastructure, business and knowledge-intensive jobs. Liverpool is identified as a Metropolitan Cluster and will contribute between 36,000 to 39,000 jobs to the local community by 2036.

The District Plan identifies a number of planning priorities that support the provision of commercial and business zoned land to meet the everyday and employment needs of Liverpool residents. Relevant Planning Priorities include:

4.1.2 Liveability

Planning Priority W3: Providing services and social infrastructure to meet people's changing needs

- Residents need the right local mix of services to meet their needs
- Improving safety, accessibility and inclusion by co-locating activities
- Fine grain urban form and land use mix provides a greater diversity of uses

Planning Priority W5: Providing housing supply, choice and affordability, with access to jobs, services and public transport

- Liverpool is identified as a housing market demand area, including land release areas
- Housing supply must be coordinated with local infrastructure with direct and safe connections to shops, services and public transport

Planning Priority W6: Creating and renewing great places and local centres, and respecting the District's heritage

- Great places provide a mix of land uses including local services at the heart of the community
- Streets are important for movement of people and goods and also enhance social and economic participation
- Movement corridors, such as Cowpasture Road, provide safe, reliable and efficient movement between centres, neighbourhoods, whilst balancing the needs of places and the communities it passes through

4.1.3 Productivity

Planning Priority W7: Establishing the land use and transport structure to deliver a liveable, productive and sustainable Western Parkland City

- The vision for Greater Sydney is one where people can access jobs and services in their nearest metropolitan and strategic centre
- Integrated land use and transport planning will assist in creating 30-minute cities
- During the morning peak, 51 per cent of residents commute outside the District for work by car, reducing the District's residents choice about where to work



The above-mentioned Planning Priorities highlight the importance of developing local centres and services to support local residents. This is particularly relevant in expanding access to employment opportunities, in-line with local population growth and the attainment of a 30-minute city. The subject site currently provides limited services and employment capacity within an existing residential zone. Rezoning of the site to B6 Enterprise Corridor better reflects its current use and future capacity to expand its service and employment offerings.

With reference to Figure 15 included in support of Planning Priority W6, appropriate development adjacent to movement corridors provides safe reliable and efficient movement between centres and neighbourhoods, whilst balancing the needs of places and the communities it passes through. Development and retention of commercial and retail uses at the site aligns with the movement and place framework established by Future Transport 2056, as well as the GSC's Western City District Plan. Due to the sites position adjacent to Cowpasture Road, the site is not suitable for residential development and R1 General Residential zoning.

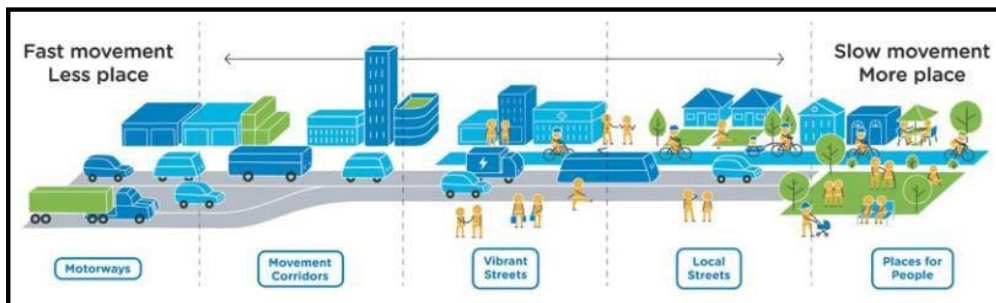


Figure 15 Movement and place framework (Source: Greater Sydney Commission)

4.1.2 Liverpool Local Strategic Planning Statement – Connected Liverpool 2040

The Liverpool LSPS seeks to provide a strategic vision for the future of the LGA, in-line with population growth and development. The LSPS identifies an expected population increase of 60% between 2019 and 2036 to 358,871 residents. Largely driven by the Western Sydney City Deal, an additional 200,000 jobs are required across the Western City District over the next 20 years, with Middleton Grange accounting for 500-1000 new jobs to 2036. It is estimated that this Planning Proposal will generate one hundred and six (106) direct and indirect jobs during the construction phase, and fifty-two (52) jobs on-site associated with the retail premises (Appendix G). The employment generation assumptions included in Appendix G are based on the revised concept plan which seeks 3,375m² two-storey retail space. The Liverpool LSPS in-part responds to the long-term structural imbalance of jobs across Greater Sydney and identifies the provision of local jobs for local people as a key priority.

The Liverpool LSPS identifies a number of connectivity and productivity related planning priorities relevant to this planning proposal, including:



4.1.4 Connectivity – Our Connections

- **Local Planning Priority 1: Active and public transport reflecting Liverpool’s strategic significance**
 - Vision to have fast and frequent connections within Liverpool and to other centres
 - Ensure all residents and workers can access the benefits of the 30-minute city
- **Local Planning Priority 2: A rapid smart transit link between Liverpool and Western Sydney International Airport/Aerotropolis**
 - Progress the FAST Corridor to deliver a rapid transit connection to Western Sydney International Airport
 - Create transit-oriented development along the route at appropriate locations and at an appropriate scale
- **Local Planning Priority 3: Accessible and connected suburbs**
 - Link suburbs and centres with each other and Liverpool City Centre by a network of pathways and cycleways
 - Advocate for improvements to public transport connections and timetabling for suburban areas and centres
 - Use placemaking principles to ensure that public transport infrastructure and accessibility to suburban centres is optimised
 - Improve local road access to suburbs and centres

4.1.4.1 Productivity – Our Jobs

- **Local Planning Priority 11: An attractive environment for local jobs, business, tourism and investment**
 - Reduce the proportion of people leaving the LGA for work
 - Support small businesses including start-ups
 - Continue advocacy for city shaping transport infrastructure to boost jobsgrowth
- **Local Planning Priority 12: Industrial and employment lands meet Liverpool’s future needs**
 - Monitor land development to ensure there is enough employment land to meet future need for a number of price points
 - Prepare flexible planning controls to ensure future businesses are not unduly restricted
 - Strengthen connectivity between Liverpool City Centre and neighbourhood and district centres

Liverpool Council’s Fifteenth Avenue Smart Transit (FAST) Corridor project will provide residents with rapid bus connection from Liverpool City Centre to Western Sydney Airport by 2026. The FAST Corridor will better connect residents of suburbs historically impacted by poor public transport amenity, including Middleton Grange, to employment opportunities. The FAST Corridor traverses the Fifteenth Avenue, Hoxton Park and Cowpasture Road intersection located approximately 100m south of the site.



As such, there is also opportunity to explore the sites capacity to deliver transit-oriented development by ensuring a long-term majority (50%+) of work-related travel movements can be achieved by sustainable modes, including walking, cycling and public transport. The sites proximity to the FAST Corridor provides opportunity to provide additional employment opportunities in a well-connected area.



Figure 16 FAST Corridor connecting Western Sydney Airport (west) to Liverpool CBD (east) via Middleton Grange (Source: Liverpool LSPS)

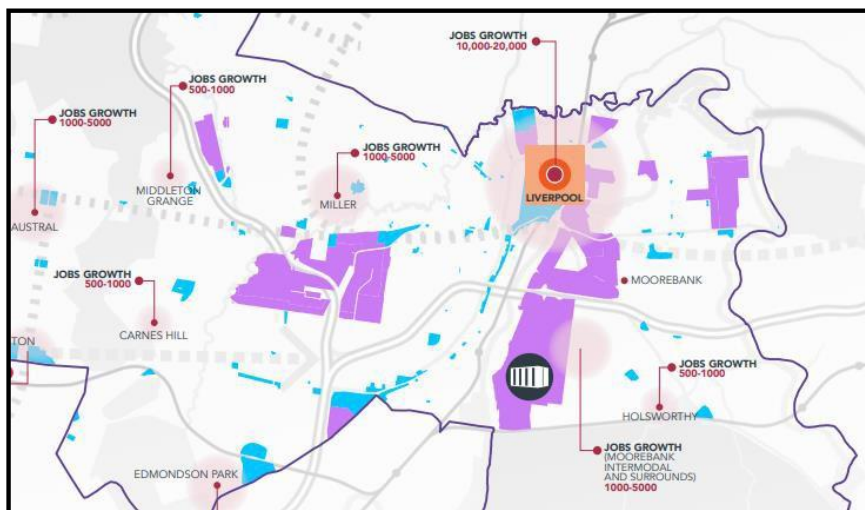


Figure 17 Major job growth areas 2016-2036 excerpt (Source: Liverpool LSPS)



4.1.3 Liverpool Industrial and Employment Lands Strategy 2020

The Liverpool Industrial and Employment Land Strategy 2020 identifies the need for more business and jobs across the LGA in response to investment and population growth. Improved provision of goods and services, as well as employment opportunities are required to support the local population. In the context of this Planning Proposal, the Strategy relates to the sites existing and proposed service and retail offerings and its capacity to provide employment opportunities in a strategically significant location. The Draft Study draws on data, insights and recommendations presented in the Knight Frank Industrial Land Study 2016, SGS Economics and Planning Industrial Lands Study 2018 and APP Industrial Development Lands Study 2019.

This Planning Proposal seeks to retain the sites existing service station, convenience store and fast-food outlets, whilst exploring additional commercial and retail uses in alignment with objectives of the B6 Enterprise Corridor zone. This will contribute to providing employment opportunities for Liverpool's rapidly increasing population. Whilst the proposed B6 Enterprise Corridor zoning is classified as employment land under the Strategy, no industrial development is intended for the site, limiting the applicability of some aspects of the Strategy. This Planning Proposal aligns with the following action:

- *Plan and manage employment lands within the western portion of the Liverpool LGA.*

The Strategy also provides a Guiding Criteria for Planning Proposals. Applicable sections of the Guiding Criteria and the Planning Proposal's alignment with these sections are included in the Table 3 below.



Table 3 Guiding Criteria for Planning Proposals (Source: Liverpool City Council)

	Guiding Criteria	Rationale	Compliance
1	Any rezoning application is to result in a sustainable increase in jobs.	Job density within the LGA is crucial in supporting the local and surrounding population of Western Sydney.	<p>This intent of the Planning Proposal to 'provide a more appropriate land use zoning to reflect the existing and future land uses', contributing to provision of local services and employment generating uses.</p> <p>This Planning Proposal is in-line with the aims and objectives of the B6 Enterprise Corridor zone, contributing to the provision of jobs service offerings within the zone. available within 30-minutes of the site.</p> <p>The proposed FAST Corridor will further support fulfillment of the 30-minute city concept by improving public transport connection to the site, in addition to existing public transport routes along Cowpasture Road.</p>
2	Rezoning proposals must be supported by an Economic Impact Study.	There is strong demand for urban services, and there is an ongoing demand for larger industrial uses broadly within the Western City District. Any rezoning proposal must sufficiently justify any transition to alternative land uses including commercial, retail or residential.	<p>It is estimated that the site currently provides sixty (60) full-time and part-time jobs across the existing service station, convenience store, Pizza Hut restaurant and KFC restaurant.</p> <p>Under this Planning Proposal, it is expected that one hundred and six (106) jobs will be provided created during the construction phase and fifty-two (52) during operation, resulting in significant employment and economic benefit that will support growth at the site (Appendix G).</p> <p>Rezoning of the site to B6 Enterprise Corridor will ensure the site is protected as key local employment land providing commercial and retail uses.</p> <p>The modest uplift to development controls proposed will ensure an improved economic use of the site and continued viability of commercial and retail uses.</p> <p>As such, this Planning Proposal is considered to be within the best economic interest of the community, particularly as it relates to employment opportunity. and economic benefit.</p> <p>This Planning Proposal is supported by an EIA prepared by HillPDA and included in Appendix G. The EIA includes justification for the economic contributions of the proposed development during construction and post- construction phases.</p>
3	Proposals must be designed to avoid land use conflict.	This applies to industrial, commercial, retail, recreational and residential uses. Measures must be employed to avoid	<p>The subject site is currently located within an R1 General Residential zone and includes a service station, convenience store and two fast food outlets.</p> <p>The site's direct access and frontage exposure to Cowpasture Road (unlike other residential properties to the north and south) makes it more suited to a zoning which encourages commercial uses, given its regional and local accessibility and highly trafficable frontage.</p>



Guiding Criteria	Rationale	Compliance
		<p>Given the orientation and access arrangements of this site to Cowpasture Road, it is not considered suitable to support residential development, particularly with regard to noise and traffic impacts.</p> <p>The sites existing use as a service station limits its potential for residential development due to the potential risk of contamination resultant from chemicals associated with this type of land use and likely costs associated with any transition under a redevelopment.</p> <p>Adjacent land uses to the north and west are largely residential and acoustic screens are provided to mitigate impacts to these sensitive neighbours.</p> <p>Future development will ensure inclusion of an adequate landscaped setback to adjoining properties, providing an Impacts to adjoining land uses will be further assessed in support of any future DA and appropriate operational procedures and mitigation measures adopted appropriate buffer along the north and west site boundaries.</p> <p>The concept scheme has been prepared with acknowledgment of potential overshadowing impacts and will seek to retain all additional shadow within the site boundary.</p> <p>The concept scheme presents an appropriate bulk and scale of development to protect the visual and acoustic amenity of adjoining residential uses.</p>
4	<p>Proposals are to demonstrate that new development will facilitate sustainable transport choices</p>	<p>Liverpool's employment lands are currently under serviced by public transport and have poor walking and cycling connections. Planning proposals must facilitate improved transport access within business hours for employees.</p>
		<p>The site is accessed via Cowpasture Road. Existing local bus services currently service the site, in addition to access by private vehicles.</p> <p>The proposed FAST Corridor is located 100m south of the site and will provide rapid public transport access following its completion by 2026.</p> <p>There is an existing footpath lining the sites Cowpasture Road frontage, providing direct connection for pedestrians and cyclists to residential areas to the west.</p>

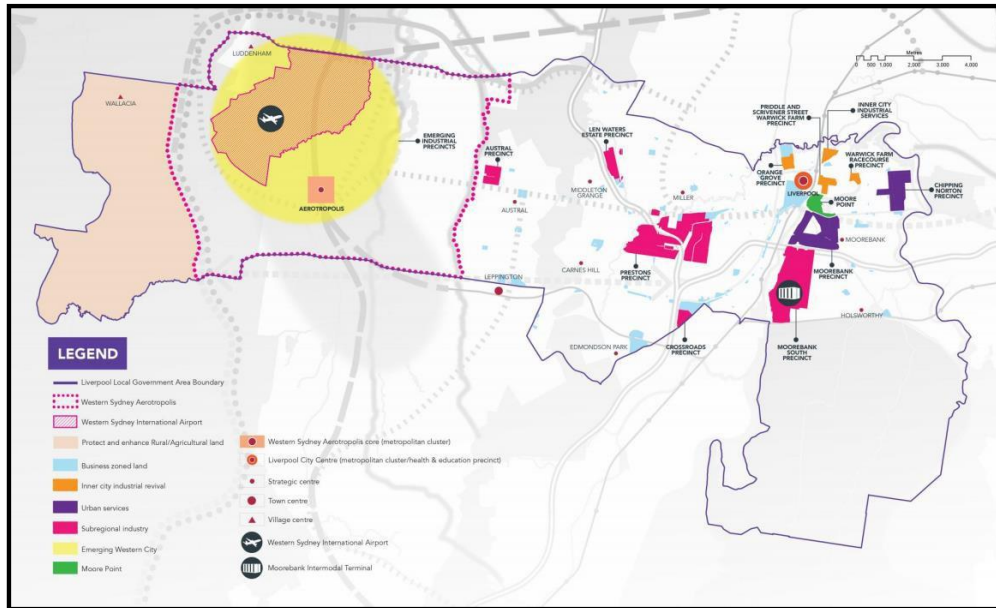


Figure 18 Industrial and Employment Lands Map (Source: Liverpool City Council)



4.1.4 Liverpool Centres and Corridors Strategy 2020

The Liverpool Centres and Corridors Strategy 2020 has been developed in response to Action 11.3 of the Liverpool LSPS. Liverpool is experiencing substantial growth and there is a need to ensure that our centres can respond to growth and emerging commercial and retail trends. It is estimated that 273,509m² of new retail supply is required to 2036 across the city centre and town centres. The Strategy includes a set of guiding criteria for Planning Proposals which are intended to ensure that centres remain viable and to ensure improved integration with the public domain and with nearby open space, social infrastructure and other services.

Table 4 identifies the Planning Proposals' alignment to the guideline:

Table 4 Liverpool Centres and Corridors Strategy 2020 – Guiding Criteria for Planning Proposals

Guiding Criteria	Rationale	Compliance
1 Proposals must not have a significant negative impact on the retail operation of the Liverpool City Centre, town centres and local centres (including planned future centres).	<p>Liverpool's centres are important focus points for the local community. They provide convenient access to retail for the local community.</p> <p>It is important that Council protects all larger local centres and ensures that they remain viable.</p> <p>New centres may be needed in the future to increase retail provision for the growing population in both greenfield and established areas, but the potential impacts of these developments on the economic viability of existing centres should be considered. An Economic Impact Assessment will be required to accompany a planning proposal.</p>	<p>The Strategy specifically identifies Middleton Grange as a proposed town centre, earmarked for future development and acknowledges that current residents have limited access to retail facilities.</p> <p>The Planning Proposal pursues a rezoning of the site to B6, in-line with existing land use and to facilitate a plethora of future B6-compatible development, as well as modest expansion of maximum height of building and FSR controls.</p> <p>The Planning Proposal includes a preliminary concept plan which provides for a 3,375m² two-storey retail building with on-site parking at the ground floor.</p> <p>The site will largely service northbound motorists on Cowpasture Road, local residents and visitors and is therefore effectively serving a different role to the larger centres at Carnes Hill, Green Valley and the proposed centres at Middleton Grange and Austral.</p> <p>The Planning Proposal will therefore not have a significant negative impact on the retail operation of the Liverpool City Centre or existing town centres and local centres.</p>



Guiding Criteria	Rationale	Compliance
		Refer to the EIA prepared by HillPDA and included in Appendix G for further justification of economic benefits.
2 The creation of new out of centre retail developments are not encouraged.	Out of centre developments cannot take a broader place- based role in addition to their retail functions.	<p>The subject site is located on the eastern boundary of Middleton Grange and will largely service northbound motorists on Cowpasture Road.</p> <p>As such, any future development will not detract from the retail function of surrounding centres including Carnes Hill, Green Valley, Austral or Middleton Grange.</p>
3 In all centres (except neighbourhood centres), proposals must retain the existing amount of retail and commercial floorspace as part of a mixed-use development.	<p>Overall floorspace demand for each kind of centre in the Liverpool LGA will likely remain stable or increase slightly. As such, retail planning should seek to retain retail premises distributed across the LGA to retain current levels of accessibility to retail facilities.</p> <p>Existing neighbourhood centres may have issues with vacancies and viability. In these circumstances, mixed use redevelopment with a reduced amount of retail may be appropriate.</p>	<p>Under this Planning Proposal, the existing site uses including the two takeaway food outlets and service station will be replaced with a specialised retail premises.</p> <p>The proposed 3,375m² two-storey commercial building is to be occupied by a specialised retailer and will constitute a more orderly and economically use of the site.</p> <p>The proposed amendments to building height and FSR controls are consistent with the proposed concept plan and surrounding B6 zoned sites, whilst ensuring flexibility in future use of the site (refer to section 3.8).</p> <p>Therefore, the Planning Proposal will effectively retain the retail character distributed across the LGA and promote accessibility to additional commercial/ retail facilities into the future.</p>



Guiding Criteria	Rationale	Compliance
4 Proposals for redevelopment or expansion of town centres and local centres must demonstrate improved integration with the public domain and with nearby open space, social infrastructure and other services.	<p>Improved design integration with surrounding open space and social infrastructure (and other services) would provide additional anchors to centres and improve their function as multi-purpose places.</p> <p>Centres which are not co-located with social infrastructure and which have a more car-based role serve an important retail function but should not be encouraged to expand. An exception to this is large format retail centres, which are vulnerable to online retail competition and broader economic trends and in which limited diversification of uses may be appropriate.</p>	The subject site is not directly connected to a town centre or local centre. The existing and proposed development predominantly services northbound motorists on Cowpasture Road.



4.2 Statutory Planning Considerations

4.2.1 Liverpool Local Environmental Plan 2008

The Liverpool Local Environmental Plan 2008 (Liverpool LEP 2008) is the relevant local environmental planning instrument comprising controls relevant to both residential and business development. Under the Liverpool LEP 2008, the site is currently zoned R1 General Residential. The existing R1 General Residential provisions relevant to the site are included in Table 5. Figures 19-21 showcase the sites current land zoning, FSR and building height mapping under the Liverpool LEP 2008.

Table 5 Current Liverpool LEP 2008 Controls

Planning Standards	Development Control
Land Zoning	R1 General Residential
Objectives	<ul style="list-style-type: none"> To provide for the housing needs of the community. To provide for a variety of housing types and densities. To enable other land uses that provide facilities or services to meet the day to day needs of residents. To ensure that housing densities are broadly concentrated in locations accessible to public transport, employment, services and facilities. To facilitate development of social and community infrastructure to meet the needs of future residents.
Planning Standards	Development Control
Permitted with Consent	Attached dwellings; Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Centre-based child care facilities; Community facilities; Dwelling houses; Educational establishments; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Home businesses; Home industries; Hostels; Multi dwelling housing; Neighbourhood shops; Oyster aquaculture; Places of public worship; Pond-based aquaculture; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Residential flat buildings; Respite day care centres; Roads; Secondary dwellings; Semi-detached dwellings; Seniors housing; Serviced apartments; Shop top housing; Tank-based aquaculture
Floor Space Ratio	0.65:1
Height of Building	8.5m

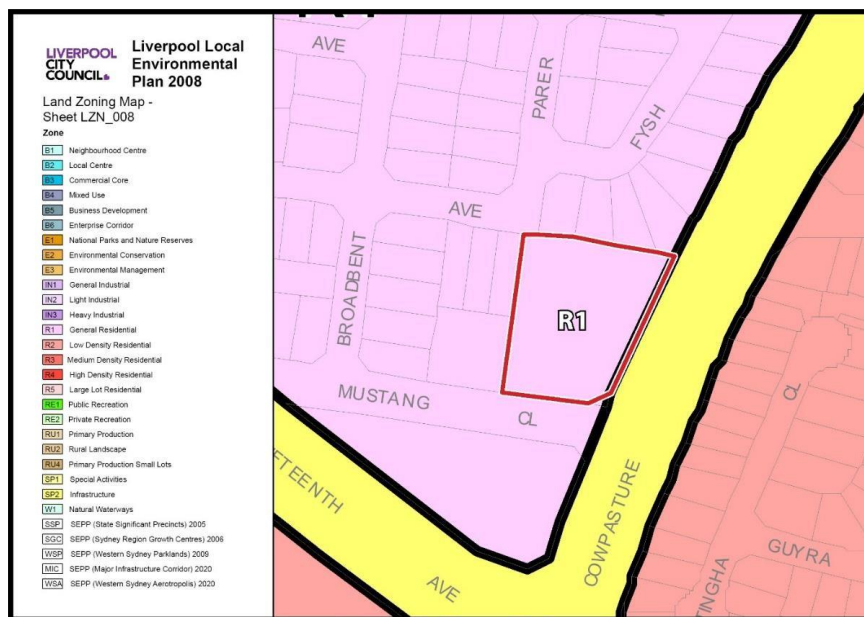


Figure 19 Land Zoning Map – Sheet LZN_008 with site highlighted (Source: Liverpool LEP 2008)



Figure 20 Floor Space Ratio Map – Sheet FSR_008 with site highlighted (Source: Liverpool LEP 2008)



Figure 21 Height of Buildings Map – Sheet HOB_008 with site highlighted (Source: Liverpool LEP 2008)

PLAN 02 Planning Proposal request to amend development standards in the Liverpool Local Environmental
Plan 2008 at 368-370 Cowpasture Road, Middleton Grange
Attachment 1 Applicant Prepared Planning Proposal Report 368-370 Cowpasture



Additionally, the site is identified as a key site under the Liverpool LEP 2008 Key Sites map – sheet KYS-008. The existing site uses are classified as additional permitted uses under Schedule 1 Clause 9 of the Liverpool LEP 2008 and are permitted with consent.

Table 6 Liverpool LEP 2008, Schedule 1 Additional permitted uses

Liverpool LEP 2008, Schedule 1 Additional permitted uses

9 Use of certain land for service stations and take away food and drink premises	<p>(1) This clause applies to land shown coloured yellow on the Key Sites Map.</p> <p>(2) Development for the following purposes is permitted with consent—</p> <p>(a) service stations,</p> <p>(b) take away food and drink premises if—</p> <p>(i) there will be no more than 1 take away food and drink premises at each of the areas shown coloured yellow on the Key Sites Map, and</p> <p>(ii) the gross floor area of the take away food and drink premises is not greater than 300m².</p>
---	--

Under Sch. 1, Cl. 9 (2)(b)(i), no more than 1 takeaway food and drink premises is permissible at an identified key site. As a result, the permissibility pathway currently available under Sch. 1 Cl. 9 does not facilitate further expansion of the site for takeaway food or drink purposes. With reference to the revised Indicative Concept Plan included in Appendix B, the existing uses and buildings are proposed to be replaced with a 3,375m² two-storey retail building which is likely to be used for a range of specialised retail premises, suited to the site's context.

4.2.1 Liverpool Development Control Plan 2008

The Liverpool Development Control Plan 2008 (Liverpool DCP 2008) contains detailed objectives and controls to guide the operation of land uses and the design, layout and siting of developments. The site is currently zoned R1 General Residential and as such the site service station, convenience store and fast food outlets are classified as additional permitted uses under Schedule 1 Clause 9 of the Liverpool LEP 2008. As such, the site is currently subject to the following sections of the Liverpool DCP 2008:

- Part 1 – General Controls for all development;
- Part 2.5 – Middleton Grange; and
- Part 3.8 – Non Residential development in Residential zones.

Part 1 and Part 2.5 of the Liverpool DCP 2008 are applicable to all development within Middleton Grange. Part 3.8 applies to non residential development in residential zones and includes specific controls for child care centres, education establishments, health consulting rooms, neighbourhood shops and shop top housing, places of public worship, exhibition homes / villages, home businesses / industries and large vehicle, vessel and trailer parking. The sites current and proposed new use do not align with the land-use specific controls under Part 3.8.



Future development of the site, in-line with the aims and objectives of the B6 Enterprise Corridor zone, would benefit from assessment under relevant sections of the Liverpool DCP 2008 applicable to retail and commercial uses. Pursuant to this Planning Proposal, the site would be subject to Part 1 and Part

2.5 of the DCP, as well as *Part 6 – Development in Business Zones (Except Liverpool City Centre)*. Part 6 of the DCP includes relevant controls that address setbacks, building design, landscaping, pedestrian access, vehicular access and car parking applicable to the B6 Enterprise Corridor zone.

Proposed changes to the sites land use zoning, FSR and maximum building height controls as a result of this Planning Proposal will too result in more aligned assessment of future commercial and retail development under the Liverpool DCP 2008. Landscaped setbacks are recommended for the site.

4.2.2 Department of Planning, Industry and Environment Planning Reforms

The DPIE is reviewing and rationalising the business and industrial zones under the Standard Instrument Principal Local Environmental Plan (SI Principal LEP). The reform will better accommodate the changing needs of businesses, better support state and local strategic planning, increase investment, and boost jobs growth. Under the proposed employment zones framework, the existing B6 zone will be converted to an E3 Productivity Support zone which will be characterised by a mix of industrial, commercial creative, warehousing and emerging new industries that need larger floor space. The following works are permitted with consent within the E3 zone:

- Oyster aquaculture;
- Tank-based aquaculture;
- Garden centres;
- Hardware & building supplies;
- Neighbourhood shops;
- Industrial retail outlets;
- Light industries;
- Artisan food and drink industry;
- Creative industries;
- High technology industries;
- Data centre;
- Home industry;
- Domestic goods repair and reuse facilities;
- General industries;
- Depots;
- Warehouse or distribution centres;
- Local distribution centres;
- Freight transport facilities;
- Industrial training facilities;
- Building identification sign; and
- Business identification sign.



The new zones will come into place on December 1 2021 and the Government will work with councils to implement the framework within their local planning rules over the next 12 months. The E3 zone is aligned to the aims and objectives of the B6 zone, as well as the purpose and objectives of this Planning Proposal.



5. Proposed Amendments

This Planning Proposal seeks to apply a zoning and development standards that is more compatible with the current uses and development on the site. It is also required to enable the development of the subject site for retail and commercial uses, beyond the existing service station, convenience store and restaurants. Note, commercial premises include business premises, office premises and retail premises. The changes to the current zoning, FSR and building height standards are included in Table 7 below:

Table 7 Proposed Amendments to Liverpool LEP 2008 controls

Planning Standards	Development Control
Land Zoning	B6 Enterprise Corridor
Objectives	<ul style="list-style-type: none"> To promote businesses along main roads and to encourage a mix of compatible uses. To provide a range of employment uses (including business, office, retail and light industrial uses). To maintain the economic strength of centres by limiting the retailing activity. To provide primarily for businesses along key corridors entering Liverpool city centre, major local centres or retail centres. To ensure residential development is limited to land where it does not undermine the viability or operation of businesses. To provide for residential uses, but only as part of a mixed use development.
Permitted with Consent	Building identification signs; Business identification signs; Business premises; Car parks; Commercial premises; Community facilities; Depots; Educational establishments; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Garden centres; Hardware and building supplies; Helipads; Home businesses; Hotel or motel accommodation; Information and education facilities; Landscaping material supplies; Light industries; Liquid fuel depots; Oyster aquaculture; Passenger transport facilities; Places of public worship; Plant nurseries; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Roads; Service stations; Serviced apartments; Shop top housing; Storage premises; Tank-based aquaculture; Transport depots; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres
Floor Space Ratio	0.75:1
Height of Building	15m



5.1 Proposed Zoning

The site is currently zoned R1 General Residential which is in direct conflict with the existing use and development on the site. Relevant objectives are largely centred around meeting local housing needs. Given the sites position adjacent to a main road corridor, residential development is not an appropriate use for the site. Furthermore, the aims and objectives of the R1 zone are largely irrelevant. The most applicable of these zone objectives, being *"to enable other land uses that provide facilities of services to meet the day to day needs of residents"*, does not accurately reflect the sites capacity to provide services beyond a petrol station and takeaway food outlets.

As part of a suite of proposed amendments to the *Liverpool Local Environment Plan 2008* (Liverpool LEP 2012), this planning proposal seeks to rezone the site from R1 General Residential to B6 Enterprise Corridor in order to better reflect the existing use of the site and enable future expansion of business and retail activities. Therefore, the site is positioned to fulfill the following B6 Enterprise Corridor zone objectives:

- To promote businesses along main roads and to encourage a mix of compatible uses;
- To provide a range of employment uses (including business, office, retail and light industrial uses); and
- To provide primarily for businesses along key corridors entering Liverpool city centre, major local centres or retail centres.

The proposed change to zoning of the site will have a negligible impact on the amenity of surrounding residential properties considering the existing operation of the site and perimeter buffers in the form of walls and landscaped setbacks which will be retained.

Furthermore, the change of use to B6 Enterprise Corridor will provide additional social benefits through increased local employment opportunities and a greater diversity of local services beyond what is currently provided on the site.

As included in section 4.2.3, the B6 zone will be converted to E3 zoning over the next 12 months. The aims and objectives of the new E3 zone are aligned to the existing B6 zone.

The proposed amendment to the sites land zoning map is included in Figure 22 and Appendix C.

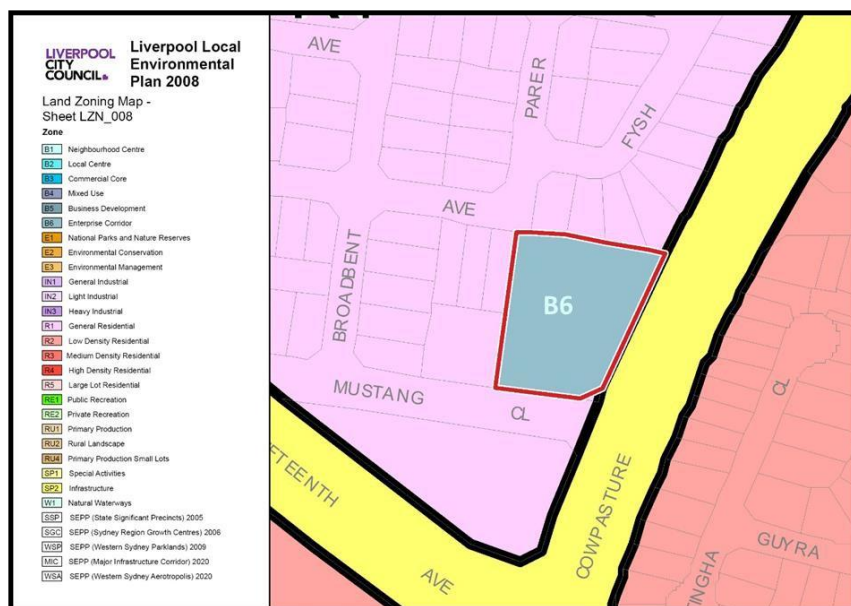


Figure 22 Amended Land Zoning Map – Sheet LZN_008 (Source: Liverpool LEP 2008 & APP)

5.2 Amendments to Development Standards

In addition to the above justification for rezoning, this planning proposal seeks amendment of the following development controls included in Liverpool LEP 2008 to better reflect the existing and proposed future land use of the site in line with surrounding character, site conditions and access. In addition to rezoning, the proposed amendments to the Liverpool LEP 2008 are as follows:

- Increase the maximum building height from 8.5m to 15m to facilitate future expansion and provision of business and retail uses; and
- Increase the maximum FSR from 0.65:1 to 0.75:1 to maximise site coverage and developable floor plates.

This planning proposal will add value to the subject site by facilitating the development of a plethora of B6 Enterprise Corridor compatible land uses including business and retail premises which will in-turn boost local employment opportunities and help stimulate the local economy. The site is well positioned to benefit from its highly trafficable frontage to Cowpasture Road whilst still acting as a transitional zoning buffer to adjacent residential land uses. Future development will be sympathetic to surrounding land uses and provide local residents with enhanced service offerings.

The proposed amendment to the sites height of buildings map is included in Figure 23 and Appendix D. The proposed amendment to the sites FSR map is included in Figure 24 and Appendix E (Revised).



Figure 23 Amended Height of Buildings Map – Sheet HOB_008 (Source: Liverpool LEP 2008 & APP)

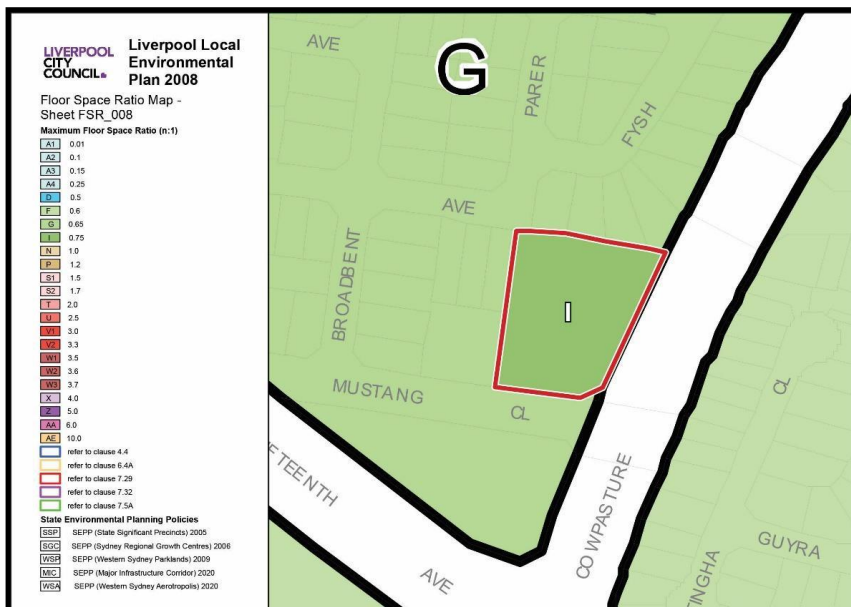


Figure 24 Amended Floor Space Ratio Map – Sheet FSR_008 (Source: Liverpool LEP 2008 & APP)



5.3 Concept Plan

This revised Planning Proposal is supported by a preferred concept plan prepared by Mosca Pserras Architects and included at Appendix B (Revised). The intent of the preferred concept plan is to present an approach to enhancing the sites flexibility by incorporating additional uses beyond the existing site offerings. The scheme shows the potential future development of the site within the building envelope of the proposed LEP amendments. The scheme would be the subject of further change and refinement and ultimately, assessment under a future Development Application (DA). Further detail on the preferred concept plan is included below.

5.3.1 Preferred Concept Plan

The indicative concept plan provides for a 3,375m² two-storey specialised retail premises in the north-west corner of the site, as well as on-site parking on the ground floor including twenty-three (23) parking spaces (eighteen (18) located within an undercroft and five (5) at-grade spaces). The proposed scheme includes a 3m landscaped setback to the northern retaining wall and a 1.275m landscaped setback to the western retaining wall, with a further 1.725m landscaped setback to the western boundary. The building will be used for a variety of specialised retail premises. Under the preferred concept plan, the existing service station, convenience store and two fast-food premises will be demolished and replaced.

The concept plan is indicative, and the intention of the proposal is to facilitate the retention of the existing on-site service station, convenience store and takeaway food outlets, whilst allowing future permissible development. The submitted concept plan illustrates that a use permissible within the B6 Enterprise Corridor zone is readily achievable on site consistent with the proposed development parameters.

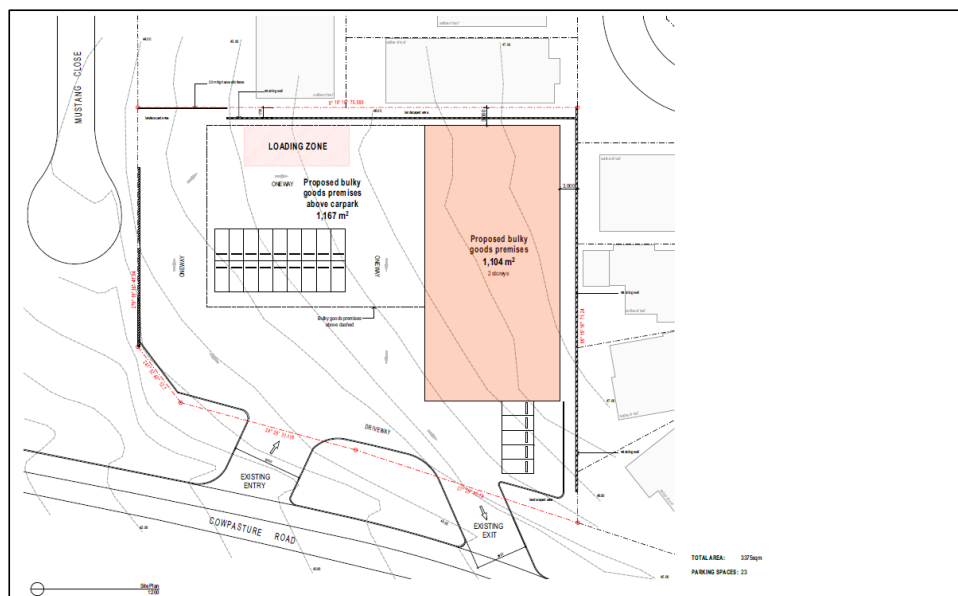


Figure 25 Preferred Concept Plan (Source: Mosca Pserras Architects)



6. Planning Proposal

Part 1 - Statement of the objectives of intended outcomes of the proposed amendment Objectives

The primary objective of the proposed amendment to Liverpool LEP 2008 is to amend relevant statutory controls to facilitate orderly development of the site at 368-370 Cowpasture Road, Middleton Grange. This Planning Proposal seeks to provide a more appropriate land use zoning to reflect the existing and future land use. The proposed increase to maximum building height and FSR controls will incentivise economic development of the site to expand the current commercial/retail uses by permitting a range of commercial development, contributing to local services provision and employment opportunity. Whilst the existing uses are permissible as additional permitted uses under Schedule 1 Clause 9 of the Liverpool LEP 2008, and any additional takeaway food and drink premises would exceed the allowances of this provision, the proposed new use will allow for increased economic benefits, including employment generating uses and growth.

The site is not currently suitable for residential development due to its access arrangements and exposed frontage to Cowpasture Road. Therefore, its continued use as a local retail offering is of high strategic value within an area earmarked for significant population growth and development. The proposed concept plan seeks a 3,375m² two-storey retail building with on-site parking located in the north-west corner of the site (Appendix B). The maximum 15m height of building limit and 0.75:1 FSR sought under this Planning Proposal can be easily accommodated on the site, allowing for flexibility for future redevelopment, and will not detrimentally impact neighbouring properties.

Furthermore, the proposed amendments will facilitate greater flexibility in development and user types that could accommodate the site in the future. This approach is in-line with recommendations included in the Liverpool Industrial and Employment Land Strategy 2020 to increase the supply of B6 zoned land across the Liverpool LGA. Furthermore, the supporting APP Liverpool Industrial Development Lands Study identifies that current FSR standards across industrial lands (including B6 zoned sites) may currently be too low, evidenced by the fact that maximum building height standards are often not reached. The FSR standards across the precincts are typically between 0.75:1 and 1:1. Due to DCP controls mandating extensive front setbacks in the order of 15-20m to main collector roads and 5-10m for local streets, site coverage for most existing sites would sit between 50-75%.

The proposed amendments sought under this planning proposal, including rezoning of the land in zone B6 Enterprise Corridor.

Intended Outcomes

The intended outcome of this planning proposal is to amend the Liverpool LEP 2008 to facilitate the rezoning of the site from R1 General Residential to B6 Enterprise Corridor, increase the maximum building height from 8.5m to 15m and increase the maximum FSR from 0.65:1 to 0.75:1. These amendments will allow modest expansion and orderly economic development of the site for Commercial activities. Future proposed development will exist within the proposed building envelope and align with the aims and objectives of the B6 Enterprise Corridor zone. This will ensure that the site responds to surrounding growth, providing additional service offerings and employment opportunities, in-line with relevant local and regional strategic planning objectives.



An EIA has been prepared by HillPDA to assess the economic input generated by the proposed development (Appendix G). The economic outcomes during construction and post-construction are substantiated as follows:

- During the construction phase the economic benefits are estimated to be:
 - 106 direct and indirect jobs years created and supported;
 - \$36.5 million in total economic output directly and indirectly created; and
 - \$15.2 million directly and indirectly contributed to the national economy (gross value added or GVA).
- On completion, the economic benefits resulting from development under the planning proposal are estimated to be:
 - A total of 52 jobs;
 - \$2.5 million in wage generation per annum, which is \$0.8 million more than the base case;
 - \$3.8 million in GVA per annum to the local economy, which is \$1.5 million more than the base case;
 - Constituting a more orderly and efficient use of the land which is more aligned with the existing uses on site and the State planning objectives to deliver additional employment generating uses and support growth.

The above figures are based on the revised concept plan included in Appendix G.

Part 2 - Explanation of the provisions that are to be included in the proposed amendment

This Planning Proposal seeks to amend the following controls outlined in the Liverpool LEP 2008 that apply to the site at 368-370 Cowpasture Road, Middleton Grange (Lot 4 in DP 1052704):

- Rezoning of the site from R1 General Residential to B6 Enterprise Corridor;
- Increase maximum building height from 8.5m to 15m; and
- Increase FSR from 0.65:1 to 0.75:1.

Part 3 - Justification for those objectives, outcomes and the process for their implementation

With reference to Part 1 and Part 2 of this Planning Proposal, the proposed amendments will allow for appropriate development of the site for commercial and retail uses. Given its position adjacent to Cowpasture Road, current and future development is well connected to key transport corridors, including the proposed FAST Corridor located 100m south of the site at the intersection of Fifteenth Avenue, Cowpasture Road and Hoxton Park Road. Implementation of the proposed amendments will facilitate additional employment opportunity, contributing to productivity outcomes identified in local and regional strategic plans. Future development will be subject to development assessment by Liverpool City Council and will need to align with the aims and objectives of the B6 Enterprise Corridor zone.



Section A – Need for the Planning Proposal

Question 1 - Is the planning proposal a result of an endorsed local strategic planning statement, strategic study or report?

Council's LSPS provides a 20-year vision for future land use planning across the Liverpool LGA. There are several planning priorities related to connectivity and productivity that directly relate to the site's unique local and regional context, including:

- Planning Priority 1: Active and public transport reflecting Liverpool's strategic significance
- Planning Priority 2: A rapid smart transit link between Liverpool and Western Sydney International Airport / Aerotropolis
- Planning Priority 3: Accessible and Connected Suburbs
- Planning Priority 11: An attractive environment for local jobs, business, tourism and investment
- Planning Priority 12: Industrial and employment lands meet Liverpool's future needs

Whilst this Planning Proposal is not directly endorsed under the Liverpool LSPS, its alignment with key planning priorities highlights the suitability of the future development proposed on the site.

Under the umbrella of 'Connectivity – Our Connections', the Liverpool LSPS identifies the 2040 vision for the LGA as a 'fast, efficient and productive city connected by rapid frequent transport, high speed digital networks and strong collaboration between community, business and government'. A critical element of this vision is to address historic disconnection of residential areas, including Middleton Grange, to strategic centres and employment opportunities.

This Planning Proposal aligns with the 30-minute city concept. As reflected by 'Planning Priority 1: Active and public transport reflecting Liverpool's strategic significance' and 'Planning Priority 2: A rapid smart transit link between Liverpool and Western Sydney International Airport/Aerotropolis', public transport across the LGA will be greatly improved over the next 20 years. The site's proximity to the proposed FAST Corridor as well as its position adjacent to Cowpasture Road will ensure it is easily accessed by surrounding communities. This Planning Proposal also relates to 'Planning Priority 3: Accessible and connected suburbs' in its intent to expand local service and employment opportunities at Middleton Grange.

Council intends to attract jobs, business, study, tourism and investment to the LGA. A major catalyst of this is Liverpool's proximity to the Western Sydney International Airport. This Planning Proposal seeks in-part to satisfy 'Local Planning Priority 11: An attractive environment for local jobs, business, tourism and investment' through its focus on expanding the site's commercial and retail offering, directly contributing to local employment opportunities.

In allowing for modest expansion of the site in-line with the proposed amendment to land use zoning, maximum building height and FSR controls, an estimated fifty-two (52) jobs will be provided at the site post-construction, resulting in \$2.5 million in wage generation per annum, which is \$0.8 million more than the base case. Additionally, it is expected that one hundred and six (106) direct and indirect jobs will be created and supported during the construction phase. In conjunction with improved public transport connectivity, the site is well located to support sustainable job growth.



As it relates to employment lands, 'Local Planning Priority 12: Industrial and employment lands meet Liverpool's future needs' highlights the need for Council to monitor land development to ensure sufficient employment land is provided for a diversity of uses. This is achieved by ensuring planning controls do not unduly restrict future business, particularly in the Liverpool CBD and well-connected neighbourhood and district centres. The sites existing and future proposed development aligns with the aims and objectives of B6 Enterprise Corridor zone and will ensure that scarce employment land is protected from future residential encroachment.

Question 2 - Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

Yes.

The proposed changes to zoning, maximum building height and FSR controls under the Liverpool LEP 2008 will enable future development of the site to be appropriately assessed by Council. As explored in Section 4.2, the proposed amendments better align with the current and proposed future use of the site, than the controls currently applicable to the site. The aims and objectives of the R1 General Residential zone do not appropriately reflect the sites capacity to contribute to local services and employment opportunities provided along a major transport corridor.

Rezoning of the site to B6 Enterprise Corridor will also ensure the sites business and employment capacity is maintained and modestly expanded under the proposed height and floor space increases.

In July 2020, APP prepared a submission on behalf of the landowner to consider inclusion of the site in Amendment 82 of the Phase 1 LEP Review to request changes to the zoning and development standards applicable to the site. The request was interpreted by Council as being "outside the scope of the Phase 1 LEP Review" and could not facilitate the amendment within the required timeframes. Pursual of a proponent-led Planning Proposal to achieve the intended site outcomes was therefore recommended by Council and is appropriate.

Section B - Relationship to strategic planning framework

Question 3 - Will the planning proposal give effect to the objectives and actions of the applicable regional, or district plan or strategy (including any exhibited draft plans or strategies)?

The relevant Greater Sydney Region Plan, 'A Metropolis of Three Cities', establishes the overarching strategic vision for Greater Sydney as it relates to infrastructure, liveability, productivity and sustainability. The plan identifies three cities within the Metropolis, including the Western Parkland City where the site is located. The proposed development aligns with several directions and objectives outlined by the GSC, particularly as they relate to productivity. 'Jobs and skills for the city' is identified as a key focus to provide greater diversity of job choice throughout the Western Parkland City. The sites current connectivity to a major transport corridor serviced by existing bus routes, as well as the sites proximity to the proposed FAST Corridor, upholds objectives related to 'integrated land use and transport' and attainment of a 30-minute city. 'Investment and business activity in Centres' intends to provide Greater Sydney residents with improved access to jobs closer to home by optimising employment opportunities adjacent to transport corridors. The proposed development will result in the modest expansion of the sites existing commercial and retail offerings and will not detract from the viability of surrounding local centres.



The Western City District Plan identifies a number of planning priorities that align with the District's expected future population growth. This requires planning for the alignment of infrastructure, business and knowledge-intensive jobs to adequately meet the everyday and employment needs of District residents. A number of liveability related planning priorities strongly align with the intent of this Planning Proposal including 'providing services and social infrastructure to meet people's changing needs', 'providing housing supply, choice and affordability, with access to jobs, services and public transport' and 'creating and renewing great places and local centres, and respecting the District's heritage'. In a site-specific context, this Planning Proposal will allow the site to better respond to the future needs of district residents, providing for one hundred and six (106) direct and indirect jobs during the construction phase and fifty-two (52) jobs during operation, contributing to local employment opportunity. This also aligns with productivity related planning priorities, including 'Establishing the land use and transport structure to deliver a liveable, productive and sustainable Western Parkland City'.



Question 4 - Will the planning proposal give effect to a council's endorsed local strategic planning statement, or another endorsed local strategy or strategic plan?

As explored in Section A, this Planning Proposal gives effect to a number of planning priorities and land use visions identified in the Liverpool LSPS. This includes, but is not limited to:

- Local Planning Priority 1: Active and public transport reflecting Liverpool's strategic significance;
- Local Planning Priority 2: A rapid smart transit link between Liverpool and Western Sydney International Airport/Aerotropolis;
- Local Planning Priority 3: Accessible and connected suburbs;
- Local Planning Priority 11: An attractive environment for local jobs, business, tourism and investment; and
- Local Planning Priority 12: Industrial and employment lands meet Liverpool's future needs.

Question 5 - Is the planning proposal consistent with applicable State Environmental Planning Policies?

This Planning Proposal is consistent with all relevant State Environmental Planning Policies (SEPPs) as discussed in the following sections. Relevant SEPPs include:

- State Environmental Planning Policy No. 55 – Remediation of Land;
- State Environmental Planning Policy No.64 – Advertising and Signage;
- State Environmental Planning Policy (Infrastructure) 2007; and
- Design and Place State Environmental Planning Policy.

State Environmental Planning Policy No. 55 – Remediation of Land

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) provides a State-wide planning approach to the remediation of contaminated land to reduce the risk of harm to human health and the environment. The site contains an existing service station, convenience store and two fast food restaurants. Pursuant to Table 1 of the *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land* (SEPP 55 Guidelines), service stations are identified as an activity that may cause contamination. This is due to the presence of chemicals including aliphatic hydrocarbons BTEX, PAHs, phenols and lead, generally associated with the service station land uses. The service station is appropriately managed, does not have a history of contamination and is not identified as a contaminated site notified to the Environmental Protection Authority (EPA).

A Preliminary Site Investigation (PSI) was prepared by Aargus Pty Ltd on 8 March 2023 and is included in Appendix J. The PSI identified contaminants of moderate to low significance in terms of risk to the human and environmental receptors identified. The PSI concluded that as the site is proposed to have a change of land use to a less sensitive land use (i.e. residential to commercial), the information collected during the investigation, the site is suitable for a commercial use.

On this basis, it was considered that the site is suitable for the land rezoning. The PSI was peer reviewed by a CEnvP Certified Contaminated Land Specialist which verified this conclusion.



State Environmental Planning Policy No.64 – Advertising and Signage

State Environmental Planning Policy No.64 – Advertising and Signage (SEPP 64) aims to ensure that site signage is compatible with an area, is suitably located and is of a high quality. Additionally, SEPP 64 also aims to ensure that public benefits may be derived from advertising in and adjacent to transport corridors. Where relevant, any future DA for the site will include assessment of proposed site advertising and signage in-line with requirements set out in SEPP 64.

State Environmental Planning Policy (Infrastructure) 2007

The *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) facilitates the effective delivery of infrastructure across the State. The ISEPP identifies matters for consideration in the assessment of certain type of infrastructure, including development with frontage to classified road and traffic-generating development. Where necessary, future DAs will be referred to Transport for NSW (TfNSW) for comment. The following statutory requirements outlined in Table 8 are applicable to the future assessment of proposed development:

Table 8 State Environmental Planning Policy (Infrastructure) 2007 relevance to proposed development

ISEPP	Relevance to Proposed Development
<p>Division 17 Roads and traffic, Subdivision 2 Development in or adjacent to road corridors and road reservations, 101 Development with frontage to classified road</p> <p>(1) <i>The objectives of this clause are—</i></p> <p>(a) <i>to ensure that new development does not compromise the effective and ongoing operation and function of classified roads, and</i></p> <p>(b) <i>to prevent or reduce the potential impact of traffic noise and vehicle emission on development adjacent to classified roads.</i></p> <p>(2) <i>The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that—</i></p> <p>(a) <i>where practicable and safe, vehicular access to the land is provided by a road other than the classified road, and</i></p> <p><i>the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of the design of the vehicular access to the land, or</i></p> <p>(i) <i>the emission of smoke or dust from the development, or</i></p>	<p>Subject to this Planning Proposal, the proposed development is located adjacent to Cowpasture Road and therefore has a frontage to a classified road under the <i>Roads Act 1993</i>.</p> <p>This Planning Proposal seeks rezoning of the site from R1 General Residential to B6 Enterprise Corridor, in-line with existing and future proposed commercial and retail uses.</p> <p>Pursuant to the requirements of Division 17(101), residential use is not suitable at the site given the potential impact of traffic noise and vehicle emissions on sensitive receivers.</p> <p>The site includes separate entry and exit point from Cowpasture Road, providing access to the existing service station, convenience store and fast-food restaurants.</p> <p>The construction process of the proposed specialised retail premises may increase traffic, noise, and dust; however, the development will adopt adequate steps to mitigate the extent of these impacts.</p> <p>The proposed commercial/ retail development will be sensitive to traffic noise and vehicle emissions from Cowpasture Road.</p> <p>The proposed concept building footprint is located at the north-west corner of the site, behind existing uses. As such, future development will benefit from increased setbacks to Cowpasture Road.</p>



ISEPP	Relevance to Proposed Development
<p>(ii) <i>the nature, volume or frequency of vehicles using the classified road to gain access to the land, and</i></p> <p>(c) <i>the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.</i></p>	<p>Division 17(2)(101) of the ISEPP will be extensively considered as part of any future DA. Subject to a future DA, the proposed use will be compatible with the sites position adjacent to a classified road.</p>
<p>Division 17 Roads and traffic, Subdivision 2 Development in or adjacent to road corridors and road reservations, 104 Traffic-generating development</p> <p>(1) <i>This clause applies to development specified in Column 1 of the Table to Schedule 3 that involves—</i></p> <p>(a) <i>new premises of the relevant size or capacity, or</i></p> <p>(b) <i>an enlargement or extension of existing premises, being an alteration or addition of the relevant size or capacity.</i></p> <p>(2) <i>In this clause, relevant size or capacity means—</i></p> <p>(a) <i>in relation to development on a site that has direct vehicular or pedestrian access to any road (except as provided by paragraph (b))—the size or capacity specified opposite that development in Column 2 of the Table to Schedule 3, or</i></p> <p>(b) <i>in relation to development on a site that has direct vehicular or pedestrian access to a classified road or to a road that connects to a classified road where the access (measured along the alignment of the connecting road) is within 90m of the connection—the size or capacity specified opposite that development in Column 3 of the Table to Schedule 3.</i></p> <p>(2A) <i>A public authority, or a person acting on behalf of a public authority, must not carry out development to which this clause applies that this Policy provides may be carried out without consent unless the authority or person has—</i></p>	<p>The subject site features a 79m frontage and direct vehicular and pedestrian access to Cowpasture Road- a State classified road.</p> <p>New premises of the relevant size or capacity is subject to provisions outlined in Division 17(2)(104) of the ISEPP.</p> <p>With reference to the table included in Schedule 3 Column 3, development for the following purposes and size or capacity is considered traffic-generating, requiring referral to TfNSW:</p> <ul style="list-style-type: none"> • Commercial premises - 2,500m² in GFA; • Food and drink premises (other than take away food and drink premises with drive- through facilities) – 300m² in GFA; • Service stations – any size or capacity; • Shops – 500m² in GFA; • Take away food and drink premises with drive-through facilities – Any size or capacity; and • Any other purpose – 50 or more motor vehicles per hour. <p>Division 17(2)(104).</p> <p>The future redevelopment of As such, future development for any of the relevant purposes included in Schedule 3 Column 3 will require referral and engagement with TfNSW in-line with the site will assess the impact of development on traffic flows, congestion and access to Cowpasture Road. Parking will be provided in accordance with Council requirements and Australian Standards.</p>



ISEPP

Relevance to Proposed Development

(a) given written notice of the intention to carry out the development to TfNSW in relation to the development, and

(b) taken into consideration any response to the notice that is received from TfNSW within 21 days after the notice is given.

(3) Before determining a development application for development to which this clause applies, the consent authority must—

(a) give written notice of the application to TfNSW within 7 days after the application is made, and

(b) take into consideration—

(i) any submission that RMS provides in response to that notice within 21 days after the notice was given (unless, before the 21 days have passed, TfNSW advises that it will not be making a submission), and

(ii) the accessibility of the site concerned, including—

(A) the efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips, and

(B) the potential to minimise the need for travel by car and to maximise movement of freight in containers or bulk freight by rail, and

(iii) any potential traffic safety, road congestion or parking implications of the development.

(4) The consent authority must give TfNSW a copy of the determination of the application within 7 days after the determination is made.



Question 6 - Is the planning proposal consistent with applicable Ministerial Directions (s.9.1 directions)?

This Planning Proposal has been assessed against the applicable s.9.1 Ministerial Directions and is consistent with each of the relevant matters outlined in Table 9.

Table 9 Consistency of the Planning Proposal with the applicable s.9.1 Ministerial Directions

Direction and Objective	Comment
1 Planning Systems	
1.1 Implementation of Regional Plans <i>(1) The objective of this direction is to give legal effect to the vision, land use strategy, goals, directions and actions contained in Regional Plans.</i>	<p>As explored in Section B, this Planning Proposal aligns with the aims and objectives of the Greater Sydney Region Plan, 'A Metropolis of Three Cities.'</p> <p>The proposed development will protect jobs and skills for the city, protecting existing and providing additional employment opportunities to achieve a 30-minute city.</p> <p>The proposed development is well placed to benefit from the proposed FAST Corridor, as well as existing transport routes via Cowpasture Road, ensuring integration of land use and transport infrastructure.</p> <p>This will support investment and business activity in local such as Middleton Grange and regional centres such as Liverpool.</p>
1.3 Approval and Referral Requirements <i>(1) The objective of this direction is to ensure that LEP provisions encourage the efficient and appropriate assessment of development.</i>	<p>Proposed amendment to the land use zoning applied to the site will ensure that future development is appropriately assessed in-line with the aims and objectives of the B6 Enterprise Corridor zone.</p> <p>In addition to modest increases to the maximum building height and FSR controls applicable to the site, this will ensure that future DAs are aligned with local and regional strategic objectives to protect employment land.</p>
4 Resilience and Hazards	
4.4 Remediation of Contaminated Land <i>(1) The objective of this direction is to reduce the risk of harm to human health and the environment by ensuring that contamination and remediation are considered by planning proposal authorities.</i>	<p>Table 1 of the SEPP 55 Planning Guideline identifies service stations as an activity that may cause contamination due to the presence of chemicals including aliphatic hydrocarbons BTEX, PAHs, phenols and lead, generally associated with the service station land uses.</p> <p>A Preliminary Site Investigation has been prepared by Aargus Pty Ltd, dated 8 March 2023 and is provided at Appendix J. The investigation identified contaminants of low significance in terms of risk to the human and environmental receptors.</p> <p>The investigation concluded that as the site is proposed to have a change of land use to a less sensitive land use, the site is suitable for the proposed land use and rezoning.</p> <p>The investigation was peer reviewed by a CEnvP certified Contaminated Land Specialist, which verified this conclusion.</p>



Direction and Objective	Comment
5 Transport and Infrastructure	
<p>5.1 Integrating Land Use and Transport</p> <p><i>(1) The objective of this direction is to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives:</i></p> <ul style="list-style-type: none"> <i>(a) improving access to housing, jobs and services by walking, cycling and public transport, and</i> <i>(b) increasing the choice of available transport and reducing dependence on cars,</i> <i>(c) reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and supporting the efficient and viable operation of public transport services, and providing for the efficient movement of freight,</i> <i>(d) supporting the efficient and viable operation of public transport services, and</i> <i>(e) providing for the efficient movement of freight.</i> 	<p>The site is located in a strategically significant location, adjacent to Cowpasture Road and within close proximity to surrounding residential and land release areas.</p> <p>In the context of local population growth, it is expected that demand for local services and jobs will increase.</p> <p>The site is accessed via Cowpasture Road and is serviced by a number of existing bus routes, as well as the future proposed FAST Corridor.</p> <p>This will ensure that residents of Middleton Grange and beyond can easily access the site using public transport. Existing pedestrian infrastructure includes a footpath lining the west side of Cowpasture Road.</p> <p>The proposed development will not impact the efficient movement of freight via Cowpasture Road. The current and proposed land uses will inherently support freight and logistic through provision of a service station and other essential commercial and retail offerings.</p>
6 Housing	
<p>6.1 Residential Zones</p> <p><i>(1) The objectives of this direction are:</i></p> <ul style="list-style-type: none"> <i>(a) encourage a variety and choice of housing types to provide for existing and future housing needs,</i> <i>(b) make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services, and</i> <i>(c) minimise the impact of residential development on the environment and resource lands.</i> 	<p>Whilst the site is not intended for residential use, this Planning Proposed includes proposal to amend the site from R1 General Residential to B6 Enterprise Corridor.</p> <p>As discussed throughout this Planning Proposal, the site is not suitable for residential use due to a number of constraints including its proximity to Cowpasture Road.</p> <p>This Planning Proposal seeks to protect the operation of employment land at the site, better suiting the existing service station, convenience store and fast food restaurants and permitting an array of B6 zone compatible development. This will in turn provide employment opportunity and key services to surrounding residents.</p>



Direction and Objective	Comment
7 Industry and Employment	
<i>7.1 Business and Industrial Zones</i>	This Planning Proposal proposes rezoning of the site from R1 General Residential to B6 Enterprise Corridor.
<i>(1) The objectives of this direction are to:</i>	
<i>(a) encourage employment growth in suitable locations,</i>	The proposal intends to provide a better alignment to the existing use of the site, and also permit an array of additional development, permissible within the B6 zone. Protecting and providing employment opportunities for residents of Middleton Grange and Liverpool LGA in a strategically significant location.
<i>(b) protect employment land in business and industrial zones, and support the viability of identified centres,</i>	The site is appropriately located with regards to public transport and the planned FAST Corridor.
<i>(c) support the viability of identified centres.</i>	The site is easily accessed by motorists via Cowpasture Road, providing connection to major regional transport corridors, including the M5 and M7, as well as local roads.
	It is estimated that the proposed development will provide 50-100 additional jobs at the site in addition to the 60 existing jobs.



Section C - Environmental, social and economic impact

Question 7 - Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

No. The site is fully developed for urban purposes and has been cleared of all native vegetation. Minimal site landscaping exists along the north and west boundary of the site, as well as ornamental hedging adjacent to the KFC drive-through. The site is not mapped as environmentally significant under the Liverpool LEP 2008. There are no known critical habitats, threatened species or ecological communities located on the site and therefore the likelihood of any negative impacts will be minimal.

Question 8 - Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

Due to the modest nature of this Planning Proposal, there are no significant environmental effects expected as a result of rezoning from R1 General Residential to B6 Enterprise Corridor, increase of maximum building height from 8.5m to 15m or increase of FSR from 0.65:1 to 0.75:1. Any future development will be subject to Development Applications.

The Planning Proposal is supported by a Preliminary Site Investigation prepared by Aargus Pty Ltd, dated 8 March 2023. The investigation identifies contaminants of moderate to low significance in some areas.

It is noted that any contamination investigation required if the existing service station is to be demolished would be completed in support of a future Development Application. The residential uses to the north and west of the site are separated by boundary fencing and landscaped setbacks, as well as acoustic screening in higher impact areas. Given the existing site uses, as well as the sites position adjacent to Cowpasture Road, the proposed commercial and retail offerings will not significantly decrease the current amenity of neighbouring properties beyond their current level.

Pursuant to this Planning Proposal, all future development will include landscaped setbacks, providing an improved buffer to adjacent residential dwellings. Existing ornamental landscaping may be removed and replaced in-line with Council's preferred species. The more established trees and bushes located within the existing setbacks will be protected based on their retention value. Furthermore, the residential uses to the north and west have a reduced ground level due to increased excavation. In addition, the site features significant retaining walls located on the north and west boundary. These measures further mitigate potential environmental effects. Future development will be of an appropriate bulk and scale, within the modest increases to site maximum building height and FSR controls. Overshadowing impacts will be considered throughout the design process with the aim to contain all additional impacts internally. The modest expansion of commercial and retail uses on the site will not adversely impact the acoustic amenity of adjoining land uses.



Question 8 - Has the planning proposal adequately addressed any social and economic effects?

Yes. The Planning Proposal will contribute to local employment opportunities, providing social and economic benefit to the community. Rezoning of the site to B6 Enterprise Corridor will seek to protect valuable employment land in Middleton Grange, avoiding redevelopment for higher order uses such as residential. The site is one of the few in the locality of its scale with direct frontage and access to Cowpasture Road. Accordingly, the site is not only well suited to accommodating main road trading services, it also offers one of the few opportunities to provide local employment in Middleton Grange and support the future growth anticipated in the region. Under the new zoning, the site will act as a natural extension to the existing uses on site and commercial uses to the south of the site, whilst providing a transitional zoning buffer to adjacent residential land uses.

Furthermore, the sites connectivity to existing bus routes via Cowpasture Road, as well as its proximity to the proposed FAST Corridor, greatly benefits accessibility to the site via public transport. Upgrade of the existing footpath lining Cowpasture Road will be considered by the Proponent in order to improve pedestrian and cyclist access to the site. Provision of improved pedestrian connection to the site via Mustang Close will also be explored by the Proponent to further contribute to social benefits associated with this Planning Proposal.

Part D – State and Commonwealth Interest**Question 9 - Is there adequate public infrastructure for the planning proposal?**

Yes. The site is located within 5m of established public and private services available within close proximity to the site, including schools, hospitals and health care, community and emergency services (refer to section 3.7).

In-line with the sites existing use, utility infrastructure is readily available at the site includes mains water, mains sewerage, electricity and telecommunications infrastructure. The scale of development envisioned for the site will be sufficiently supported by existing utilities and services, requiring only minor augmentation. Any augmentation, upgrade or new connection required will form detail provided in a future DA.



Question 10 - What are the views of state and Commonwealth public authorities consulted in accordance with the Gateway determination?

No consultation with State or Commonwealth authorities has been carried out to date on the Planning Proposal. It is acknowledged that Liverpool City Council will consult with relevant public authorities following the Gateway Determination.

Part 4 - Supporting maps which identify the aspects of the Planning Proposal

The Planning Proposal seeks amendment to the following maps included in the Liverpool LEP 2008:

- Land Zoning Map – Sheet LZN_008 to reflect rezoning from R1 General Residential to B6 Enterprise Corridor;
- Height of Buildings Map – Sheet HOB_008 to reflect increase of maximum building height from 8.5m to 15m; and
- Floor Space Ratio Map – Sheet FSR_008 to reflect increase of FSR from 0.65:1 to 0.75:1 (revised).

The proposed amendments to the relevant Liverpool LEP 2008 maps are included in Appendix C to Appendix E.

Part 5 - Details of community consultation that is to be undertaken for the Planning Proposal

The Planning Proposal will be required to be publicly exhibited for 28 days in accordance with the requirements of 'A Guide to Preparing Local Environmental Plans'. Council are responsible for exhibiting the Planning Proposal through the following means:

- A notice in the local newspaper;
- A notice on the Liverpool City Council website; and
- Written correspondence to neighbouring land owners.

The Proponent will review and respond to any matters raised by members of the general public or neighbouring land owners following the initial exhibition period as required.

Part 6 - Project Timeline

An indicative project timeframe is provided below in Table 10:



Table 10 Indicative Timeframe

Milestone	Date
Lodgement of Planning Proposal	December 2021
Preliminary Assessment by Council	December 2021– March 2022
Advisory comment from Local Planning Panel	November 2022
Matter reported to Council Meeting	February 2023
Planning Proposal referred to DPIE for Gateway Determination	March 2023
Gateway Determination issued by DPIE	June 2023
Applicant to address matters raised and address conditions of Gateway	June 2023 – August 2023
Public Exhibition	September 2023 – October 2023
Consideration of submissions	November 2023
Final Assessment	November 2023 – January 2024
Final Report to Council	February 2024
Submission to DPIE to finalise LEP	March 2024
Gazettal	May 2024



7. Conclusion

This Planning Proposal has been prepared by APP Corporation Pty Ltd on behalf of Cowpasture Road (2005) Pty Ltd, the Owners of 368-370 Cowpasture Road, Middleton Grange. It has been prepared in accordance with Section 3.3 of the EP&A Act and the Department of Planning's 'A Guide to Preparing Planning Proposals'.

The Planning Proposal seeks an amendment to the Liverpool Local Environment Plan 2008 (Liverpool LEP 2008) to rezone the land to ensure compatibility with the current use and development on the site. It will also facilitate the future orderly development of a modest commercial and retail space, in addition to the sites existing service station, convenience store and two fast-food outlets. The Planning Proposal seeks to amend the following controls under the Liverpool LEP 2008:

- Rezoning of the site from R1 General Residential to B6 Enterprise Corridor;
- Increase to maximum building height limit from 8.5m to 15m; and
- Increase of maximum floor space ratio from 0.65:1 to 0.75:1.

As addressed in section 4.2.3, as part of the current DPIE planning reforms, the B6 zone will be converted to a new E3 Productivity Support zone and will be implemented over the next twelve (12) months from December 1 2021. This zone seeks to better support state and local strategic planning, increase investment, and boost jobs growth and will be characterised by a mix of industrial, commercial creative, warehousing and emerging new industries that need larger floor space. The E3 zone is aligned to the aims and objectives of the B6 zone, as well as the purpose and objectives of this Planning Proposal.

A revised concept plan has been produced by Mosca Pserras Architecture to represent development opportunities viable through amendment of relevant zoning controls and development standards presented in this Planning Proposal. The development concept includes a two storey specialised retail premises with under croft parking. The concept provides for a gross floor area of 3,375m², equating to a FSR of 0.75:1. The preferred concept plan will enable the following development outcomes:

- Pursuant to this Planning Proposal, future development of additional commercial offerings;
- A new land zoning, reflective of the existing uses on-site; and
- Parking at ground level in-line with Council requirements and relevant Australian Standards.

The Planning Proposal demonstrates both local and regional strategic merit as presented in Chapter 4 of this report. It aligns with relevant priorities included in the Liverpool LSPS and Western City District Plan, particularly as it relates to securing job opportunities, protecting employment land, aligning transport infrastructure and development, meeting the everyday needs of local residents and contributing to the economic growth of the Western Parkland City. It will facilitate provision of additional commercial offerings.



In addition to retention of the estimated sixty (60) existing full-time and part-time jobs at the site, fifty two (52) jobs are anticipated to be provided post-construction. The revised concept will further increase job generation. This will significantly contribute to Council's job target of 500 to 1,000 new jobs at Middleton Grange by 2041.

The site is well connected to a key infrastructure corridor, being Cowpasture Road, which is serviced by existing bus routes. The sites proximity to the proposed FAST Corridor will further improve the sites connection to the Western Sydney Airport / Aerotropolis, Liverpool CBD and surrounding residential areas. Proponent-led upgrade of the existing pedestrian footpath lining the sites Cowpasture Road frontage will be considered to enable improved pedestrian and cyclist access to the site from existing residential areas via Mustang Close.

Due to the modest increases in maximum building height and FSR proposed, future development will be of an appropriate bulk and scale, including landscaped setbacks to adjoining residential properties to the north and west in-line with the preferred concept plan included in Appendix B. The increased buffer will protect the visual and acoustic amenity of residents located at Fysh Avenue and Parer Avenue. All overshadowing impacts will be contained internally to further protect residential amenity.

The proposed amendments to the Liverpool LEP 2008 will ensure that future, partial development of the site will diversify the existing commercial and retail offerings in a strategically significant area of Liverpool and the Western Parkland City. Future development will conceptually align with the plans prepared by Mosca Pserras Architecture, as well as the public benefits outlined in this report.

Accordingly, we urge Council and DPIE to support the proposed amendments to the Liverpool LEP 2008.



Appendices



Appendix A. Site Survey



Appendix B. Preferred Concept Plan (Revised)



Appendix C. Amended Land Zoning Map



Appendix D. Amended Height of Buildings Map



Appendix E. Amended Floor Space Ratio Map (Revised)



Appendix F. Existing Site Plan



Appendix G. Economic Impact Assessment (Updated)



Appendix H. Detailed Site Investigation



Appendix I. Traffic Report (Updated)



Appendix J. Preliminary Site Investigation



Property and Infrastructure Specialists

Adelaide

61 8 8409 4280

Level 1

151 South Terrace
Adelaide SA 5000**Brisbane**

61 7 3238 0400

Ground Floor

143 Coronation Drive
Milton QLD 4064**Canberra**

61 2 9957 6211

Level 9

121 Marcus Clarke Street
Canberra ACT 2600**Melbourne**

61 3 8866 0200

Level 7

420 St Kilda Road
Melbourne VIC 3004**Newcastle**

61 2 4928 7600

Level 2

426 King Street
Newcastle NSW 2300**Perth**

61 8 9224 6300

Level 4

181 Adelaide Terrace
Perth WA 6004**Sydney**

61 2 9957 6211

Level 7

116 Miller Street
North Sydney NSW 2060**Tamworth**

61 421 959 484

Suite 6

493 Peel Street
Tamworth NSW 2340**Wollongong**

61 2 4220 6300

Suite 3, Level 1

6-8 Regent Street
Wollongong NSW 2500

APP Corporation Pty Limited ABN 29 003 764 770

DAVIS STACK

UPDATED TRAFFIC REPORT FOR
AMENDED PLANNING
PROPOSAL FOR 368-370
COWPASTURE ROAD,
MIDDLETON GRANGE

SEPTEMBER 2022

COLSTON BUDD ROGERS & KAFES PTY LTD
ACN 002 334 296
Level 18 Tower A
Zenith Centre
821 Pacific Highway
CHATSWOOD NSW 2067

Telephone: (02) 9411 2411
Email: cbrk@cbrk.com.au

REF: 11760/2

Colston Budd Rogers & Kafes Pty Ltd

TABLE OF CONTENTS

TABLE OF CONTENTS

1. INTRODUCTION	1
2 TRAFFIC IMPLICATIONS.....	2

ATTACHMENT A: CONCEPT PLAN

Colston Budd Rogers & Kafes Pty Ltd

CHAPTER I

I. INTRODUCTION

- I.1 Colston Budd Rogers and Kafes Pty Ltd has been commissioned by Davis Stack to prepare an updated traffic report for the amended planning proposal for 368-370 Cowpasture Road, Middleton Grange, as requested by Liverpool City Council in the following email dated 3 May 2022:

Council's traffic and transport section requests that the traffic impact assessment is updated in line with the amended planning proposal

- I.2 The amended planning proposal would allow for a two level large format retail (bulky goods) development, which would replace the existing uses on the site. The updated traffic report is based on the concept plan prepared by MPA (drawing number AP01- REV F -dated 24 August 2022). A copy of this plan is provided in Attachment A.
- I.3 The traffic implications of the amended planning proposal are assessed in the following chapter.
-
-

Colston Budd Rogers & Kafes Pty Ltd

CHAPTER 2

2. TRAFFIC IMPLICATIONS

2.1 The traffic implications of the amended planning proposal are set out through the following sections:

- site location;
- amended planning proposal;
- public transport;
- parking provision;
- access, parking layout and servicing;
- traffic effects; and
- summary.

Site Location

2.2 The site is located on the western side of Cowpasture Road, between Sixteenth Avenue/Qantas Boulevard to the north and Fifteenth Avenue/Hoxton Park Road to the south, as shown in Figure 1. The site is currently occupied by a petrol station with attached Pizza Hut (some 300m² LFA), on the northern part of the site and a KFC (40 seats with a drive through), on the southern part of the site. 39 parking spaces are provided within the site. Access is provided from Cowpasture Road and is limited to left turns via separate entry and exit driveways. Surrounding land use is generally low density residential development, with a gym located to the west of the site and electricity substation south of the site.

Colston Budd Rogers & Kafes Pty Ltd

CHAPTER 2

Amended Planning Proposal

- 2.3 The amended planning proposal would allow for a two level large format retail (bulky goods) development, which would replace the existing uses on the site. A concept plan has been prepared by MPA (drawing number AP01 - REV F -dated 24 August 2022). A copy of the plan is provided in Attachment A. The concept plan provides some 3,375m² GFA bulky goods over two levels, with provision of 23 parking spaces (18 located within an undercroft and 5 at-grade spaces). No changes to the current access arrangements are proposed.

Public Transport

- 2.4 Interlink operate a number of services in the vicinity of the site. These include:
- Route 853 – connecting Carnes Hill with Liverpool CBD via Middleton Grange. This operates along Cowpasture Road past the site;
 - Route 855 - connecting Rutleigh Park/Leppington and Liverpool CBD via Carnes Hill. This operates along Fifteenth Avenue/Hoxton Park Road to the south of the site; and
 - Route 861 – connecting Carnes Hill and Willow Dale via Leppington. This operates along Fifteenth Avenue/Hoxton Park Road to the south of the site.
- 2.5 Access to bus stops on the opposite side of Cowpasture Road and Fifteenth Avenue/Hoxton Park Road is provided at the traffic signal controlled intersections of Cowpasture Road with Fifteenth Avenue/Hoxton Park Road and Qantas Boulevard/Sixteenth Avenue, located north and south of the site respectively.
-
-

Colston Budd Rogers & Kafes Pty Ltd

CHAPTER 2

2.6 Thus the site is accessible by public transport. The amended planning proposal will increase employment densities close to existing public transport services. It would therefore strengthen demand for these services. The amended planning proposal is therefore consistent with government policy and planning principles of:

- (a) improving accessibility to employment and services by walking, cycling and public transport;
- (b) improving the choice of transport and reducing dependence solely on cars for travel purposes;
- (c) moderating growth in the demand for travel and the distances travelled, especially by car; and
- (d) supporting the efficient and viable operation of public transport services.

Parking Provision

2.7 The Liverpool City Development Control Plan (DCP) 2008 provides the following parking requirements for large format retail (bulky goods):

- bulky goods greater than 3,000m² GFA - 1 space per 150m² GFA.

2.8 Applying this rate, the amended planning proposal would require 23 spaces. This is the proposed parking provision (including one accessible spaces). In addition, four employee and four visitor bicycle spaces will be provided, as required by DCP 2008.

Colston Budd Rogers & Kafes Pty Ltd

CHAPTER 2

Access and Parking Layout

- 2.9 No changes to the current access arrangements are proposed. There are separate entry and exit driveways, with a deceleration lane for entry. Vehicular circulation within the site will be one way clockwise. Reconfigured parking spaces will be a minimum of 5.4 metres long by 2.6 metres wide. Spaces with adjacent obstructions will be 0.3 metres wider. Disabled parking spaces will be 2.4 metres wide, with a 2.4 metre wide adjacent area for wheelchairs. Circulation aisles will be a minimum of 6.6 metres wide. These dimensions are appropriate, being in accordance with AS 2890.1:2004 and AS 2890.6:2009.
- 2.10 The new building will be serviced via a loading bay located within the undercroft area on the western of the site. Service vehicles will include garbage collection and deliveries, with the largest truck being an 12.5 metre long large rigid truck (HRV). Service vehicles will enter and exit in a forward direction.
- 2.11 Following approval, access arrangements, parking layouts, servicing and vehicle swept paths should be reviewed and confirmed for compliance.

Traffic Effects

- 2.12 Cowpasture Road is located along the eastern frontage of the site. Access from Cowpasture Road is left in/left out with separate entry and exit driveways with a deceleration lane for entry. Cowpasture Road provides a major link through Sydney's western and south western suburbs. Adjacent to the site, it provides a six lane dual carriageway, with three traffic lanes in each direction separated by median. Traffic signal controlled intersections of Cowpasture Road with
-
-

Colston Budd Rogers & Kafes Pty Ltd

CHAPTER 2

Fifteenth Avenue/Hoxton Park Road and Qantas Boulevard/Sixteenth Avenue are located north and south of the site respectively.

- 2.13 In order to establish existing traffic flows, traffic counts were undertaken during the weekday morning and afternoon peak periods at the intersections of Cowpasture Road/site accesses. The results are summarised in Table 2.1 and displayed in Figures 2 and 3.

Table 2.1: Existing Weekday Morning and Afternoon Hourly One Way Traffic Flows		
Location	Weekday AM	Weekday PM
Cowpasture Road (northbound) - north of Hoxton Park Road	3125	2650
Site Access		
- entry	45	95
- exit	40	80

- 2.14 Examination of Table 2.1 reveals that:

- ❑ Cowpasture Road (northbound) carried some 2,650 to 3,125 vehicles per hour (one way) during the weekday morning and afternoon peak hours;
- ❑ the existing uses on the site generated some 85 vehicles per hour (two way) during the weekday morning peak hour; and
- ❑ the existing uses on the site generated some 175 vehicles per hour (two way) during the weekday afternoon peak hour.

- 2.15 TfNSW guidelines suggest generation rates of some 1.01 to 2.44 vehicles per 100m² GFA for bulky goods development at peak times on a weekday. The amended planning proposal (with some 3,375m² GFA) would generate some than

Colston Budd Rogers & Kafes Pty Ltd

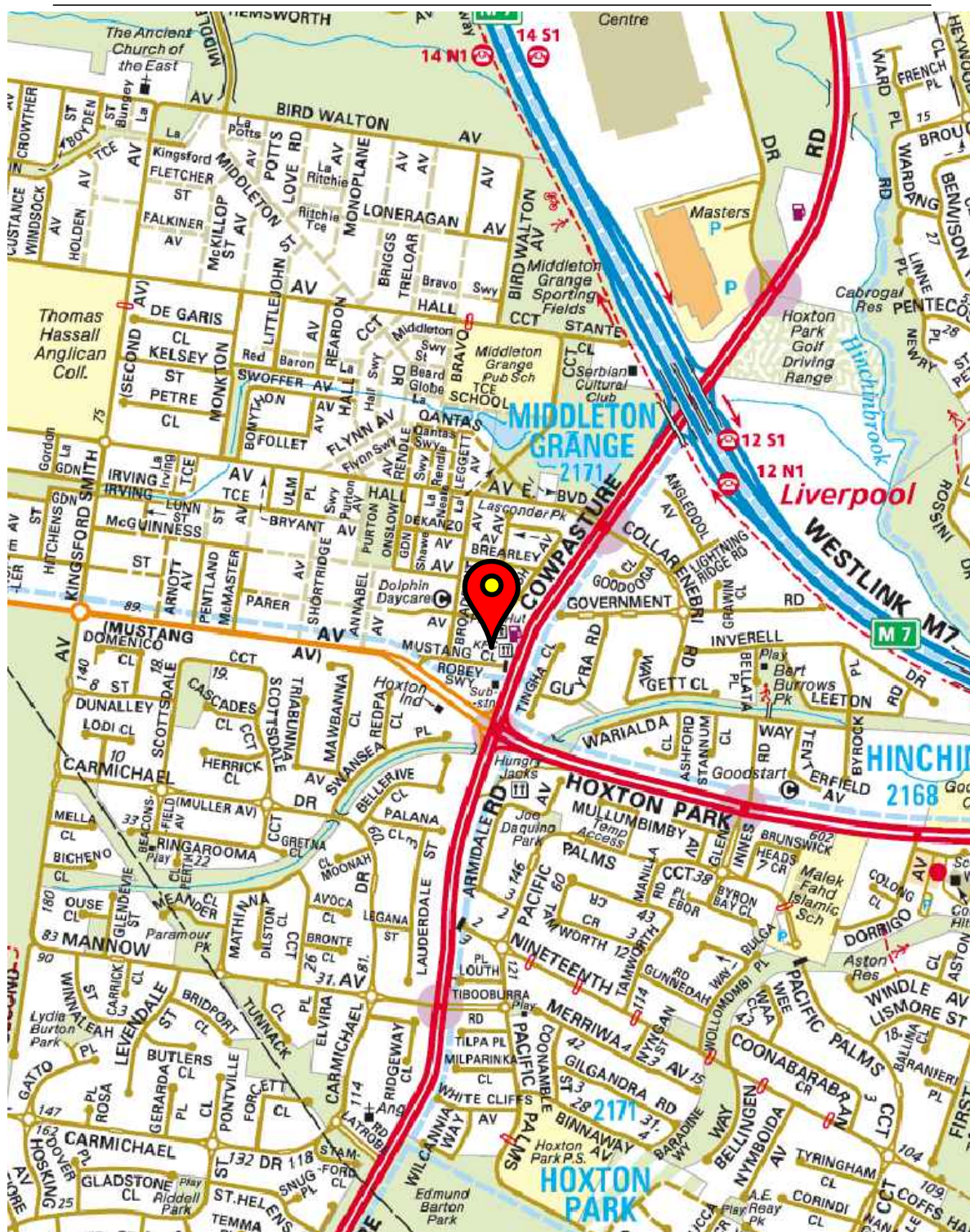
CHAPTER 2

35 to 85 vehicles per hour (two way) on a weekday. Therefore, the amended planning proposal would generate less traffic than the existing uses on the site of some 85 to 175 vehicles per hour (two way).

Summary

- 2.16 In summary, the main points relating to the traffic and parking implications of the amended planning proposal are as follows:
- i) the amended planning proposal is for a two level bulky goods development replacing the existing uses on the site;
 - ii) the proposed parking provision is appropriate;
 - iii) no changes are proposed to the existing site access arrangements;
 - iv) internal parking and circulation will be provided in accordance with AS 2890.1:2004 and AS 2890.6:2009;
 - v) the proposed service arrangements are appropriate;
 - vi) following approval, access arrangements, parking layouts, servicing and vehicle swept paths should be reviewed and confirmed for compliance; and
 - vii) the amended planning proposal would generate less traffic than the existing uses on the site.
-
-

11760 - KFC Middleton Grange



Click: <https://goo.gl/maps/9VNyxUeAYw9WubL49>

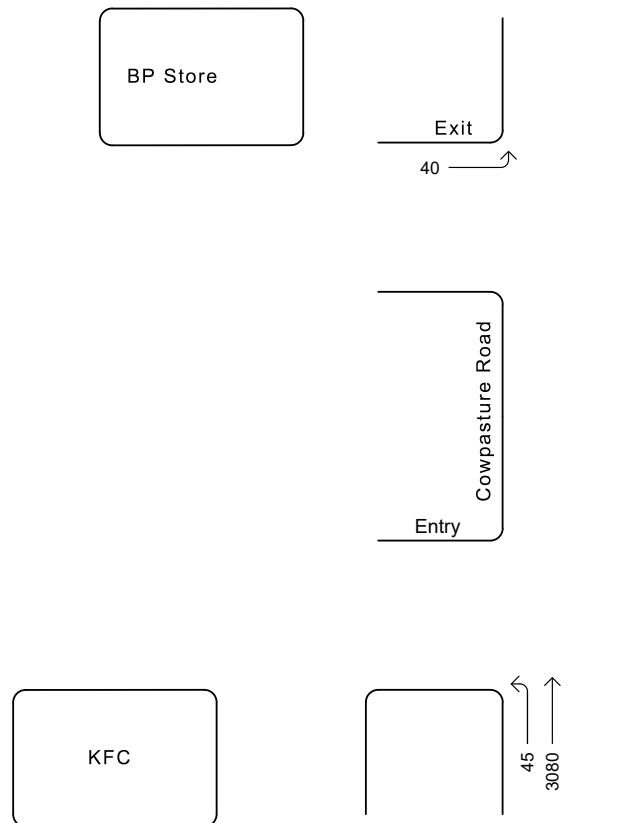
Location Plan

Colston Budd Rogers & Kafes Pty Ltd

Drawn By: CBRK Pty Ltd_hs Ref: 11760 11.11.2021

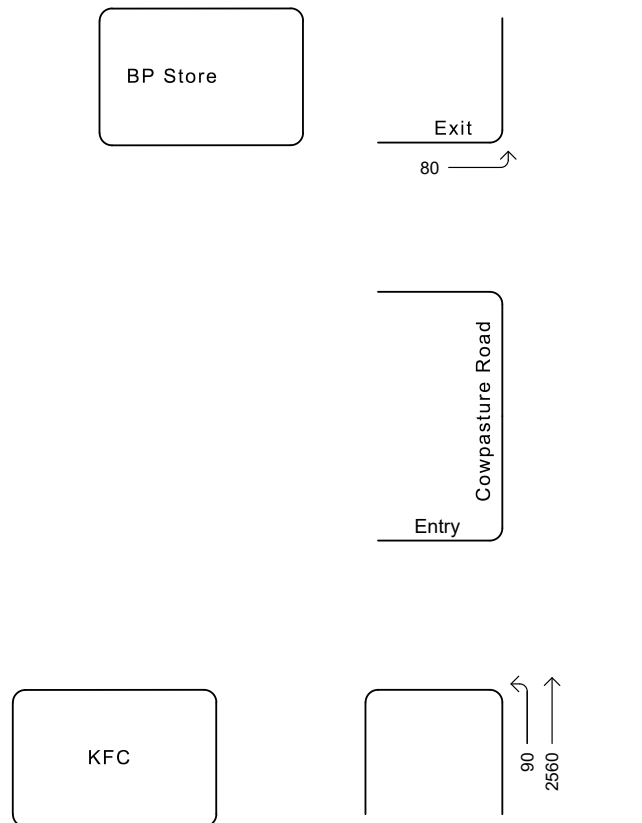
Figure 1

11760 - KFC Middleton Grange



**Existing weekday morning
peak hour traffic flows**

11760 - KFC Middleton Grange



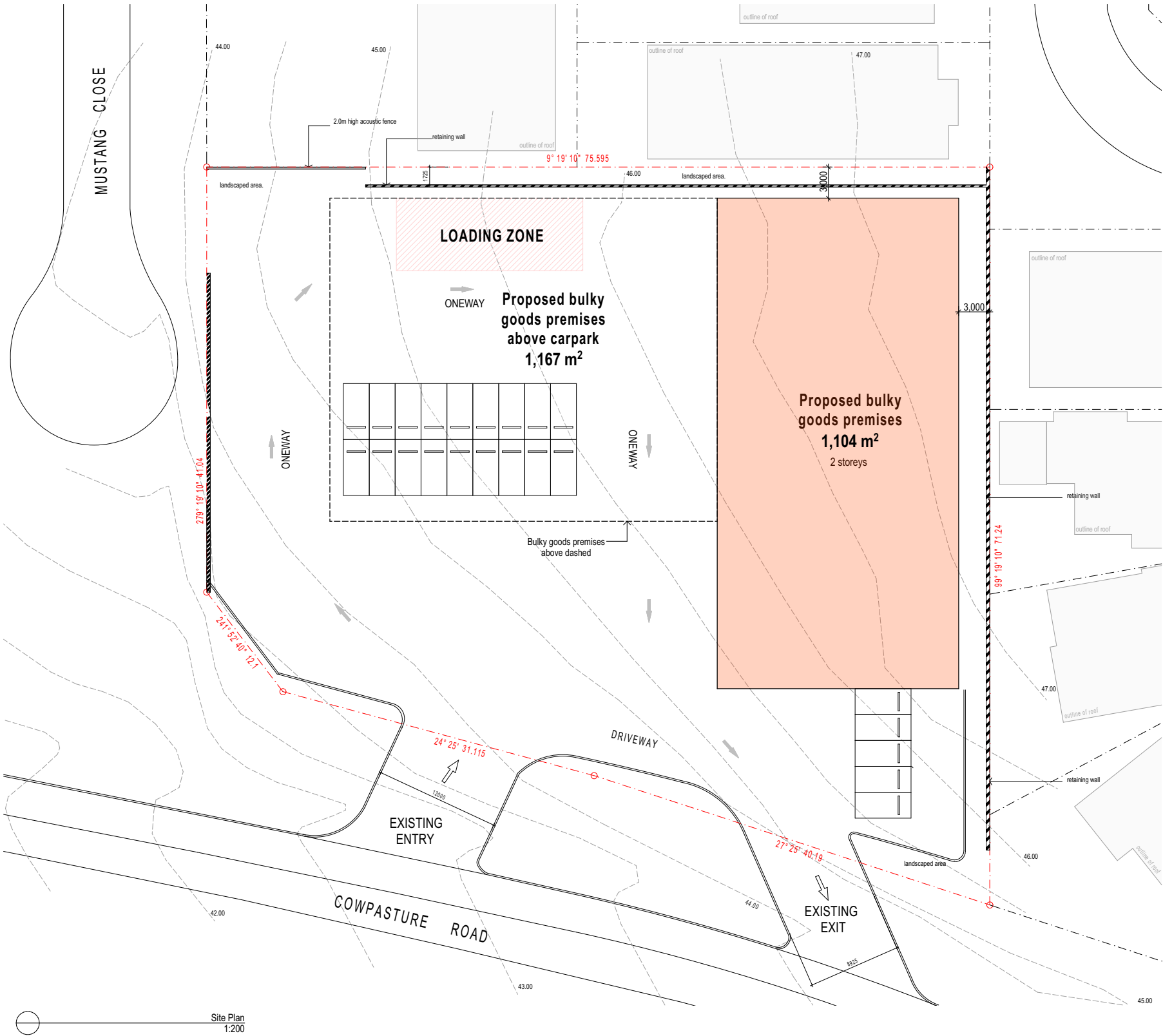
**Existing weekday afternoon
peak hour traffic flows**

Colston Budd Rogers & Kafes Pty Ltd

ATTACHMENT A

ATTACHMENT A

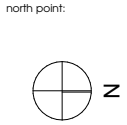
CONCEPT PLAN – DRAWING AP01 REV F



TOTAL AREA: 3375sqm
PARKING SPACES: 23

□ this drawing is copyright and the property of the author, and must not be retained, copied or used without the authority of mosca pseras architects.
□ larger scale drawings and written dimensions take preference.
□ do not scale from drawing
□ all dimensions to be checked on site before commencement of work.
□ all discrepancies to be brought to the attention of the author.

e reception@moscapseras.com.au
w www.moscapseras.com.au



Revision	Description	By	Date
A	Planning Proposal	MR	08.07.21
B	Planning Proposal	MR	08.11.21
C	Planning Proposal	MR	03.12.21
D	For Review	MR	11.02.22
E	For Review	RB	23.08.22
F	Planning Proposal	RB	24.08.22

key plan:

notes:

- Concept building footprint for planning proposal
- Loading zone entry



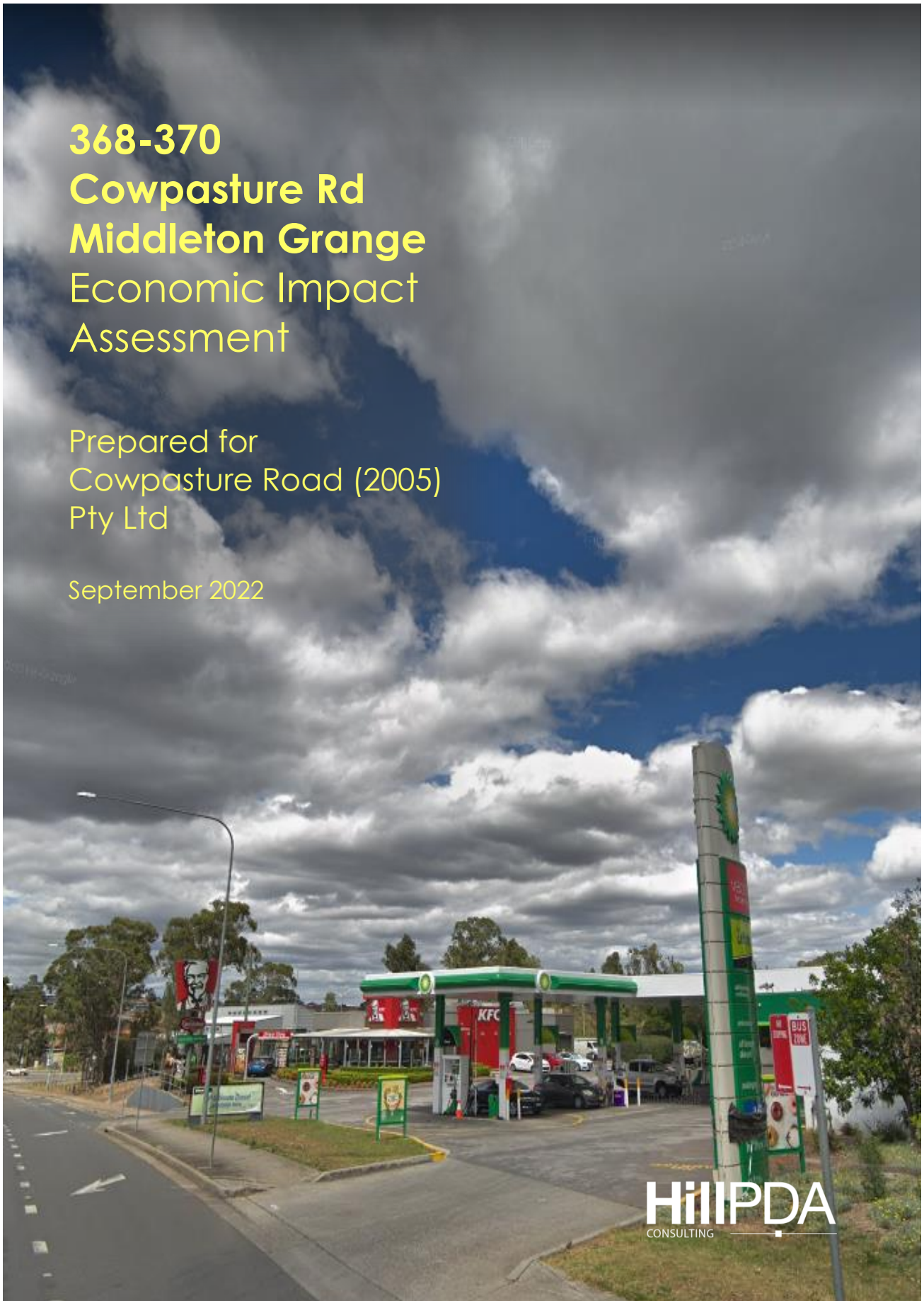
project
location
client
drawing title
scale
job no.
project architect
drawing no.
revision

Planning Proposal
368-370 Cowpasture Rd, Middleton Grange
Davis Stack
ARCHITECTURAL PLANS
Site Plan
1:200
21021
AP01
F

368-370 Cowpasture Rd Middleton Grange Economic Impact Assessment

Prepared for
Cowpasture Road (2005)
Pty Ltd

September 2022



CONTENTS

Executive summary	4
1.0 Introduction	7
1.1 Purpose and study structure.....	7
2.0 Local context and planning proposal.....	9
2.1 The subject site	9
2.2 Local context	9
2.3 Accessibility.....	9
2.4 Planning proposal	10
3.0 Economic Impact Assessment	13
3.1 Economic impacts during the construction phase	13
3.1.1 Construction – output impact	14
3.1.2 Construction – Gross Value Added (GVA) impact	14
3.1.3 Construction related employment.....	14
3.2 Economic performance of the base case	15
3.3 Operational economic impacts of planning proposal	15
3.3.1 Employment.....	15
3.3.2 Total remuneration	16
3.3.3 Gross value added.....	16
3.3.4 Other construction impacts	16
3.4 Summary and implication	Error! Bookmark not defined.
3.5 Other economic benefits	16
3.5.1 Investment stimulus.....	16
3.5.2 Jobs closer to home	Error! Bookmark not defined.
3.5.3 Activation	Error! Bookmark not defined.
3.5.4 Other Considerations	16
4.0 Impacts on the retail hierarchy	19
4.1 Carnes Hill Town Centre.....	19
4.2 Hoxton Park Neighbourhood Centre	19
4.3 Green Valley Town Centre	19
4.4 Austral Town Centre	20
4.5 Middleton Grange Shell service station	20
4.6 Other retail centres.....	20
4.7 Middleton Grange Village/Town Centre (Proposed)	20
4.8 Summary of key findings.....	21



Tables

Table 1: Estimated construction cost	13
Table 2: Construction output impact (\$m)	14
Table 3: Construction Gross Value Added impact	14
Table 4: Construction employment impact	15
Table 5: Potential employment generation	15
Table 6: Potential salaries	16
Table 7: Gross Value Added	16
Table 8: Economic Impact of the Proposal	Error! Bookmark not defined.

Figures

Figure 1: Planning Proposal's preferred concept plan	11
--	----

Quality Assurance

Report Contacts

Aneta Ramos

Senior Consultant

Bachelors of Psyc (Hons) and Commerce (Economics), PgCert Behavioural Economics

Aneta.Ramos@hillpda.com

Supervisor

Adrian Hack

Principal, Urban and Retail Economics


M. Land Econ. B.Town Planning (Hons). MPIA

Adrian.Hack@hillpda.com

Quality Control

This document is for discussion purposes only unless signed and dated by a Principal of HillPDA.

Reviewer

Signature		Dated	06/09/22
-----------	---	-------	----------

Report Details

Job Number	C22043
Version	Final
File Name	Middle Grange PP EIA
Date Printed	6 September 2022



EXECUTIVE SUMMARY

HillPDA have been commissioned by APP Corporation Pty Ltd (APP) on behalf of Cowpasture Pty Ltd (2005) Pty Ltd, to prepare an Economic Impact Assessment (EIA) for the Planning Proposal at 368-770 Cowpasture Road, Middleton Grange (referred to as the subject site hereafter).

The Planning Proposal

The Planning Proposal seeks to amend the Liverpool Local Environment Plan 2008 (Liverpool LEP 2008) to facilitate the orderly development and continued use of the site for a diverse range of commercial activities as follows:

- Rezone the land from R1 General Residential to B6 Enterprise Corridor;
- Increase the maximum height of building standard from 8.5m (under clause 4.3 of the Liverpool LEP 2008) to 15m; and
- Increase the maximum floor space ratio (FSR) standard from 0.65:1 (under clause 4.4 of the Liverpool LEP 2008) to 0.75:1.

The Planning Proposal is supported by a preliminary concept plan developed by Mosca Pserras Architects. The concept includes the replacement of the existing uses on site with 3,375sqm of bulky goods retailing in a two level building with on-site car parking.

Justification for Planning Proposal based on salient features of the site

The subject site has a total site area of 4,500sqm, with a 79m frontage to Cowpasture Road along its eastern boundary. A single storey BP service station (including an ancillary convenience store) and Pizza Hut restaurant currently occupy the northern end of the site, while a separate KFC restaurant occupies the southern end. The current commercial activities are estimated to employ 60 full time and part time jobs. The current uses on site are prohibited in the R1 zone yet are permissible as additional permitted uses under Schedule 1 Clause 9 of the Liverpool LEP 2008. The modest uplifts in building height and FSR will enable an increase in floor space on the site and support jobs in bulky goods retailing.

Low density residential, interspersed with limited retail, commercial and industrial uses surround the site. A small provision of industrial and commercial uses exist immediately to the south of the site. As such the Planning Proposal will act as natural extension to the existing uses on site and commercial uses to the south of the site, whilst providing a transitional zoning buffer to adjacent residential land uses. Moreover, the proposed zoning is considered more suitable than the current zoning of R1 (i.e. which promotes residential development), due to the noise and traffic impacts of Cowpasture Road. Finally, the Planning Proposal also responds to the projected growth in the region, through securing additional employment land (which are currently underprovided for) whilst delivering enhanced services for local residents.

The site has direct access and exposure to Cowpasture Road and is in close proximity (i.e. within 500m) to the northern on-ramps and southbound exit ramps of the M7 Motorway. As such the site is well positioned to capitalise on main road trade and visual exposure. Connectivity to the site is likely to further improve with the planned trackless trams proposed to operate near the site to the south along Hoxton Park Road. As such commercial uses are considered suitable on the site given its regional and local accessibility and highly trafficable frontage.

Economic benefits of Planning Proposal

The proposed development would have economic benefits during construction and post-construction. The following provides an estimate of these.



During construction

During the construction phase the economic benefits are estimated to be:

- 106 direct and indirect jobs¹ created and supported
- \$36.5 million in total economic output directly and indirectly created
- \$15.2 million directly and indirectly contributed to the national economy (gross value added or GVA)

Post-construction

On completion the economic benefits resulting from development under the planning proposal are estimated to be:

- A total of 52 jobs, around 8 less jobs than the base case (ie currently provided onsite)
- \$2.5 million in wage generation per annum, which is \$0.8 million more than the base case
- \$3.8 million in GVA per annum to the local economy, which is \$1.5 million more than the base case
- Constituting a more orderly and efficient use of the land which is more aligned with the existing uses on site and the State planning objectives to deliver additional employment generating uses and support growth.

Impacts on surrounding centres

The subject site will retail bulky goods and therefore effectively serve a different role to the larger centres at Carnes Hill, Green Valley and the proposed centres at Middleton Grange and Austral.

¹ Note that jobs in construction are not full time jobs given that the construction period is limited in time. Technically this refers to 'job years' where one 'job year' equals one full time job over one year. To calculate average FTE jobs, total job years can be divided by the number of years to complete the project. For example if the construction period is three years then 9 job years can be divided by three to derive an average of 3 jobs during the three year period of construction.

INTRODUCTION



1.0 INTRODUCTION

HillPDA have been commissioned by APP Corporation Pty Ltd (APP) on behalf of Cowpasture Pty Ltd (2005) Pty Ltd, to prepare an Economic Impact Assessment (EIA) for the Planning Proposal at 368-770 Cowpasture Road, Middleton Grange (referred to as the subject site hereafter).

The Planning Proposal seeks to amend the Liverpool Local Environment Plan 2008 (Liverpool LEP 2008) to facilitate the orderly development of commercial activities. The amendments include:

- Rezoning the land from R1 General Residential to B6 Enterprise Corridor;
- Increasing the maximum height of building standard from 8.5m (under clause 4.3 of the Liverpool LEP 2008) to 15m; and
- Increasing the maximum floor space ratio (FSR) standard from 0.65:1 (under clause 4.4 of the Liverpool LEP 2008) to 0.75:1.

A preliminary concept plan has been developed for the site, which includes redevelopment for 3,375sqm.

A more detailed account of the scheme is provided in Section 2.4.

1.1 Purpose and study structure

The primary objective of this study is to assess and quantify, where possible, the economic impacts attributable to developing the Planning Proposal. To capture the net economic impacts of the Planning Proposal, the economic contribution of development proposed is compared to the base case or the no action alternative (i.e. economic contribution of the current built form and land uses on site).

To meet the requirements of the brief, the study is set out in the following manner:

- **Chapter 1** | Provides an overview of the report and report structure
- **Chapter 2** | Reviews the subject site and the local context, followed by a description of the Planning Proposal, including key details and rationale for the proposed development
- **Chapter 3** | Examines the economic contribution that the subject site currently generates, referred to as the “Base Case”. The Chapter then examines the economic impacts of developing the site in accordance with the Planning Proposal during both the construction and operational phases. The economic implications are compared to the base case.
- **Chapter 4** | Provides commentary on the commercial centres hierarchy and considers the impact that the Planning Proposal will have on surrounding centres.

LOCAL CONTEXT AND PLANNING PROPOSAL



2.0 LOCAL CONTEXT AND PLANNING PROPOSAL

This Chapter considers the regional and local context of the subject site and outlines the salient features of the site in the context of supporting additional commercial uses on site. A detailed description of the Planning Proposal, including the rationale for the proposed development is also explored.

2.1 The subject site

The subject site is legally described as Lot 4 DP 1052704, 368-370 Cowpasture Road, Middleton Grange. The subject site has a total site area of 4,500sqm, with a 79m frontage to Cowpasture Road along its eastern boundary. A single storey BP service station (including an ancillary convenience store) and Pizza Hut restaurant currently occupy the northern end of the site, with a separate KFC restaurant occupying the southern end. The current commercial activities are estimated to employ 60 full time and part time jobs².

The subject site is currently zoned R1 General Residential under the Liverpool LEP 2008 and is subject to a maximum building height provision of 8.5m under Clause 4.3 and a maximum FSR of 0.65:1 under Clause 4.4. The current uses on site are prohibited in the R1 zone yet are permissible as additional permitted uses under Schedule 1 Clause 9 of the Liverpool LEP 2008.

2.2 Local context

The subject site is located some 6.5 km west of Liverpool Central Business District (CBD) and 33.3km west of Sydney CBD. The nearest retail centre to the site is Carnes Hill Shopping Centre, located approximately 2.8km to the south. 3km to the north of the site is the established industrial Len Waters Estate. Middleton Grange and surrounding suburbs including Carnes and Hoxton Park are characterised by low density residential, interspersed with limited retail, commercial and industrial uses. The site is also one of few sites in the locality with scale and direct frontage and access to Cowpasture Road. As such, the subject site is not only well suited to accommodating main road trading services due to these advantages; it also offers one of the few opportunities to provide local employment in Middleton Grange and support the future growth anticipated in the region.

Low density residential bound the site to the north and north-west and are generally separated by large acoustic barriers and landscape treatments. An established low density residential area also features to the east of the site on the eastern side of Cowpasture Road. An Anytime Fitness adjoins the site to the south-west, with a small provision of industrial and commercial uses to the south of the site including: a packaging company on the northern side of the Fifteenth Avenue and Cowpasture Rd intersection; and a Shell service station, Coles express and Hungry Jacks on the southern side of the Hoxton Park Rd and Cowpasture Rd intersection.

As such the Planning Proposal will act as natural extension to the existing uses on site and commercial uses to the south of the site, whilst providing a transitional zoning buffer to adjacent residential land uses. Moreover, the proposed zoning is considered to be more suitable than the current zoning of R1 (i.e. which promotes residential development), due to the noise and traffic impacts of Cowpasture Road on residential uses. Finally, the Planning Proposal also responds to the projected growth in the region, through securing additional employment land whilst delivering enhanced services for local residents, passing motorists and visitors.

2.3 Accessibility

The site is located on the western side of Cowpasture Road and is in close proximity (i.e. within 500m) to the northern on-ramps and southbound exit ramps of the M7 Motorway. Cowpasture Road also provides a regional connection to the M5 South Western Motorway. As such the site is supported by a strong road network providing

² APP (2020) Planning Proposal Application to Amend Liverpool LEP 2008, 368-370 Cowpasture Rd, Middleton Grange



strong connectivity and benefits from exposure to passing traffic along Cowpasture Road. As such the site is well positioned to capitalise on main road trading.

Vehicular and pedestrian access to the site is via Cowpasture Road. In terms of vehicular access into the site, left only access is provided via the southern driveway, with vehicles exiting left from the site via the northern driveway meaning the site is more conveniently positioned for north-bound traffic along Cowpasture Road.

In terms of public transport infrastructure, the site is serviced by numerous bus services including Route 853 Carnes Hill to Liverpool via Hoxton Park, which connects the site (with a bus stop immediately to the north of the site) to various local and regional centres and employment precincts. Connectivity to the site via public transport is likely to improve with the planned trackless trams proposed to be developed near the site to the south along Hoxton Park Road. The planned route will link the site to Liverpool and the catalytic Western Sydney Airport and Aerotropolis.

On this basis commercial uses are considered suitable on site given the site's regional and local accessibility and highly trafficable frontage.

2.4 Planning proposal

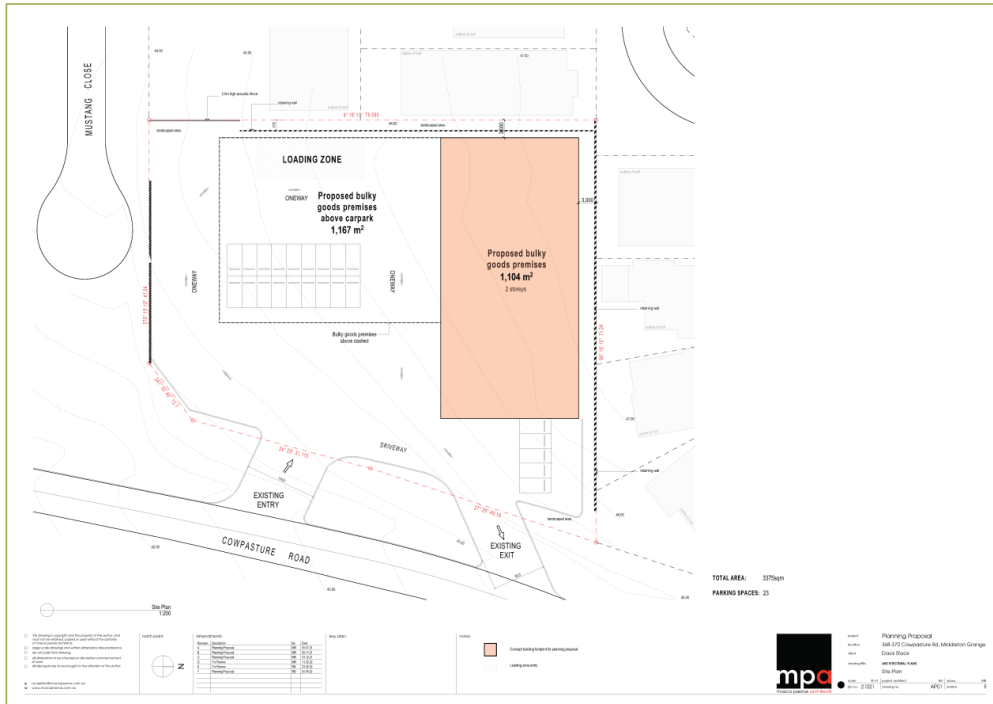
The Planning Proposal seeks to change the land use permissibility to enable the provision of employment generating land uses on the site and seeks to amend the Liverpool LEP 2008 as follows:

- Rezone the site from R1 General Residential to B6 Enterprise Corridor;
- Increase the maximum height of building standard from 8.5m (under clause 4.3 of the Liverpool LEP 2008) to 15m; and
- Increase the maximum floor space ratio (FSR) standard from 0.65:1 (under clause 4.4 of the Liverpool LEP 2008) to 0.75:1.

The primary objective of the Planning Proposal is to 'provide a more appropriate land use zoning to reflect the existing and future land uses,' and facilitate the development of additional employment generating uses, contributing to provision of local services and employment opportunities.

The Planning Proposal is supported by a preliminary concept plan developed by Mosca Pserras Architects. The concept (refer to figure below) includes the replacement of the existing fuel and fast food retailers with a two level building accommodating bulky goods retailers.

Figure 1: Planning Proposal's preferred concept plan



Source: Mosca Pserras Architects

ECONOMIC IMPACT ASSESSMENT



3.0 ECONOMIC IMPACT ASSESSMENT

The following Chapter assesses and where possible quantifies the potential economic impacts of the Planning Proposal measured against the “do nothing” or “status quo” option. Economic metrics estimates include employment, wages, GVA and construction multipliers (associated with the construction of the Planning Proposal).

3.1 Economic impacts during the construction phase

This section assesses the potential economic benefits during construction. The economic impacts during the construction phase are assessed for the Planning Proposal scenario only, as the base case involves no constructive costs and represents the study’s no action alternative.

The economic impacts of the construction stage are based on the estimated total construction cost of around \$11.6 million. This estimate has been sourced from Rawlinson Construction Handbook 2021 and calculated as follows:

Table 1: Estimated construction cost

Component	No.	Units	\$/unit	\$m
Bulky goods retailing	3,375	sqm	\$2,000/sqm	\$6.75
Fitout	3,375	Sqm	\$600/sqm	\$2.03
Site costs and carparking	4,500	sqm	\$220/sqm	\$0.99
Contingencies @ 10%				\$0.98
Design and other professional fees @ 8.5%				\$0.91
Total				\$11.65

The construction industry is a significant component of the economy, accounting for 5.96% of Gross Domestic Product (GDP) and employing just over one million workers across Australia³. The industry has strong linkages with other sectors, so the impacts on the economy go further than the direct contribution of construction. This is known as the multiplier effect. Multipliers refer to the level of additional economic activity generated by a source industry.

There are two types of effects captured by multipliers:

Production Induced Effects: which is made up of:

- *Direct effects:* which constitutes all outputs and employment required to produce the inputs for construction, and
- *Indirect effects:* which is the induced extra output and employment from all industries to support the increased production of the construction sector.

Consumption Induced Effects: which relates to the demand for additional goods and services due to increased spending by the wage and salary earners across all industries arising from employment.

The source of the multipliers adopted in this report is ABS Australian National Accounts: Input-Output Tables 2018-19 (ABS Pub: 5209.0).

Note that the multiplier effects are national, and not necessarily local. The ABS states that:

“Care is needed in interpreting multiplier effects; their theoretical basis produces estimates which somewhat overstate the actual impacts in terms of output and employment. Nevertheless, the estimates illustrate the high

³ Source: IBIS World Construction Industry Report 2018



flow-on effects of construction activity to the rest of the economy. Clearly, through its multipliers, construction activity has a high impact on the economy."

In particular, the multiplier impacts can leave the impression that resources would not have been used elsewhere in the economy had the development not proceeded. In reality, many of these resources would have been employed elsewhere. Note that the NSW Treasury guidelines state:

*"Direct or flow on jobs will not necessarily occur in the immediate vicinity of the project – they may be located in head office of the supplier or in a factory in another region or State that supplies the project"*⁴.

Nevertheless, economic multiplier impacts represent considerable added value to the Australian economy.

3.1.1 Construction – output impact

As discussed above the Planning Proposal will have a direct impact on construction output as well as indirectly stimulating other industries which assist in production or cater to increased consumption. The table below details the output multipliers and shows that the Planning Proposal would generate a further **\$1.2 million** of activity in production induced effects and **\$0.9 million** in consumption induced effects. The total economic activity generated by construction of the Planning Proposal would be around **\$3.1 million**.

Table 2: Construction output impact (\$m)

	Direct effects	Production induced effect	Consumption induced effect	Total
Output multipliers	1.000	1.235	0.901	3.136
Output (\$million)*	11.7	14.4	10.5	36.5

* Includes design costs and other professional fees related to construction at 8.5%

Source: Hill PDA Estimate using data from ABS Australian National Accounts: Input-Output Tables 2018-19 (ABS Pub: 5209.0)

3.1.2 Construction – Gross Value Added (GVA) impact

The Gross Value Added (GVA) of an industry refers to the value of outputs less the costs of inputs. It also measures the contribution that the industry makes to the economy or gross domestic product (GDP).

The proposed construction would directly contribute around \$3.7 million to GDP. Including the multiplier impacts, a total of \$15.2 million would be contributed to GDP (measured in 2019 dollars) as shown in the table below.

Table 3: Construction Gross Value Added impact

	Direct effects	Production induced effect	Consumption induced effect	Total
GVA multipliers	0.317	0.511	0.479	1.307
GVA (\$million)	3.7	6.0	5.6	15.2

* Includes design costs and other professional fees related to construction at 8.5%

Source: Hill PDA Estimate using data from ABS Australian National Accounts: Input-Output Tables 2018-19 (ABS Pub: 5209.0)

3.1.3 Construction related employment

Every million dollars of design and construction work undertaken generates 2.42 job years⁵. Based on the estimated construction cost, 28 job years⁶ would be directly generated by the proposed development as shown in the table below.

⁴ Source: Office of Financial Management Policy & Guidelines Paper: Policy & Guidelines: Guidelines for estimating employment supported by the actions, programs and policies of the NSE Government (TPP 09-7) NSW Treasury

⁵ Source: ABS Australian National Accounts: Input – Output Tables 2018-19 (ABS Pub: 5209.0) adjusted to 2019 dollars

⁶ Note: One job year equals one full-time equivalent job over one year



Table 4: Construction employment impact

	Direct Effects	Production Induced Effects	Consumption Induced Effects	Total
Multipliers	1	1.444	1.320	3.764
Job Years per \$million	2.424	3.501	3.199	9.124
Total Job Years Generated	28	41	37	106

Source: Hill PDA Estimate using data from ABS Australian National Accounts: Input-Output Tables 2018-19 (ABS Pub: 5209.0), ABS Census 2016 Data

From the ABS Australian National Accounts: Input-Output Tables 2018-19 HillPDA identified employment multipliers for production support and consumption induced effects of 1.44 and 1.32 respectively for every job year in direct construction. Including the multiplier impacts, the proposed expansion of businesses would support a total of **106 job years directly and indirectly**.

3.2 Economic performance of the base case

As sourced from APP Planning Proposal Report the site provides an estimated 60 full-time and part-time jobs, as follows:

- 10 full-time and part-time jobs associated with the service station and convenience store;
- 20 full-time and part-time jobs associated with the Pizza Hut restaurant; and
- 30 full-time and part-time jobs associated with the KFC restaurant⁷.

It is estimated that these jobs could generate an estimated \$1.7 million in salaries⁸ and contribute \$2.3 million in GVA per annum⁹.

3.3 Operational economic impacts of planning proposal

The following section estimates the potential economic contribution of the Planning Proposal once the land uses are fully operational as compared to the “do nothing” or “base case” scenario.

3.3.1 Employment

The Proposal would support permanent employment post-construction in bulky goods retailing – assumed at 67.5sqm GFA per worker.

The table below provides an estimate of the number of jobs that would be supported on the subject site in accordance with the Planning Proposal.

Table 5: Potential employment generation

Land use	Floorspace (NLA)	Employment density*	No. of workers
Bulky goods retailing	3,375sqm	1 worker / 65sqm	52
Total Employment			52

* Sources include ABS Retail Survey 1998-99, IBIS World reports and Hill PDA Research

The Planning Proposal has the capacity to accommodate around 52 jobs following building completion. As such, development as proposed would support 8 less jobs than the base case.

⁷ APP (2020) Planning Proposal Application to Amend Liverpool LEP 2008, 368-370 Cowpasture Rd, Middleton Grange

⁸ Weight average salary of comparable fuel retailing retailers and fast food and take away food services as sourced from IBIS World reports.

⁹ Weight average GVA of comparable fuel retailing retailers and fast food and take away food services as sourced from IBIS World reports.



3.3.2 Total remuneration

The total potential remuneration of workers on-site in accordance with the Planning Proposal is estimated at **\$2.5 million**, as shown in the table below. This is \$0.8 million more in remuneration than the base case (i.e. 44% increase).

Table 6: Potential salaries

Land use	No. of workers	Average wage	Total wage generation (\$m)
Bulky Goods retailing	52	\$48,000	\$2.5

Source: IBIS World Industry Reports

3.3.3 Gross value added

Gross value added of an industry refers to the value of outputs less the costs of inputs. It also measures the contribution that the industry makes to the wealth of the country, state or region – its contribution to GDP.

We estimate the potential gross value added from the employment generating uses in accordance with the Planning Proposal to be in the order of **\$3.8 million every year** as shown in the table below. This is \$1.5 million above the base case (i.e. 63% increase).

Table 7: Gross Value Added

Land use	No. of workers	GVA/worker	Total GVA (\$m)
Total GVA	52	\$73,500	\$3.8

Source: IBIS World Industry Reports and HillPDA Estimate.

3.3.4 Other construction impacts

The construction process may lead to short-term negative impacts in the locality, such as increased traffic, noise, dust and so on. We have assumed that the development would take the necessary steps to mitigate the extent of these impacts.

3.4 Other economic benefits

3.4.1 Investment stimulus

Where a significant property investment decision has been made, it is generally viewed as a strong positive commitment for the local area. Such an investment can, in turn, stimulate and attract further investment. Development of the Planning Proposal would support a wide range of economic multipliers which would, in turn, support investment in associated industries. It would also help to raise the profile of Middleton Grange for potential investors.

The Planning Proposal would create additional business opportunities in this locality. It would increase the profile of this area and, in so doing, increase the financial feasibility of surrounding developments, potentially acting as a catalyst on surrounding sites.

3.4.2 Other Considerations

The development of the subject site would be expected to provide other benefits at the community level, including the following:

- Enhanced service facilities for passing traffic, local residents and visitors
- Provision of greater employment self-sufficiency in the Middleton Grange region



- Workers and residents in the locality will generate expenditure on retail goods and services to the benefit of existing and future businesses in the Middleton Grange town centre.

IMPACTS ON THE RETAIL HIERARCHY



4.0 IMPACTS ON THE RETAIL HIERARCHY

This Chapter reviews the surrounding centres hierarchy and the environment within which the proposed commercial uses will operate, taking into account both existing and future commercial developments in the surrounding region.

4.1 Carnes Hill Town Centre

The Carnes Hill Town Centre is located about 2.8km to the north of the subject site¹⁰. The town centre provides some 37,000sqm of retail floorspace of which the majority of floorspace (i.e. 17,797sqm) located in Carnes Hill Marketplace. Carnes Hill Marketplace is a sub-regional shopping centre, anchored by a Big W discount department store (7,300sqm) and a Woolworths supermarket (4,414sqm) and includes a Dan Murphy's large format liquor store, 45 specialty stores and 957 at-grade car parking spaces¹¹. The centre trades strongly with a recorded total Moving Annual Turnover (MAT) of around \$165.35 million as at 2020, ranking it 8th in the country for similar sized centres¹². Moreover, this equates to \$10,160/sqm which is 14% above the median for similar sized centres. The town centre also accommodates a freestanding Aldi supermarket, along with surrounding pad-sites, including a medical centre, McDonalds, Pizza Hut and a service station. The town centre provides a substantially larger offer than the proposed centre at the subject site and serves a different function in the retail / commercial hierarchy.

4.2 Hoxton Park Neighbourhood Centre

A small parcel of B1 zoned land spanning over of 1.3Ha is located 1.9 km¹³ to the south-east of the subject site on the southern side of Hoxton Park Road. Hoxton Park Shopping Centre currently occupies the site and provides an estimated 2,000sqm of Gross Lettable Area (GLAR).¹⁴ The centre includes a small a liquor store, a newsagent, two hairdressers, a chemist, medical centre, small scale business services as well as three neighbourhood restaurants and cafes¹⁵.

The Planning Proposal has a different offer with bulky goods and hence would not impact this centre.

4.3 Green Valley Town Centre

Green Valley Town Centre is centrally located within the suburb of Green Valley, some 4.6 km¹⁶ north-east of the subject site. The retail and commercial floorspace is largely focused within The Valley Plaza, which provides 10,300sqm is anchored by a Coles (3,561sqm) and Woolworths (2,271sqm) and 34 speciality tenants¹⁷.¹⁸ As of December 2020 the centre reported a Moving Annual Turnover (MAT) of \$101.26 million, which equates to \$11,316/sqm. The \$MAT/sqm is 27% above the average for similar sized centres and ranks the centre 29th from 132 similar sized centres¹⁹.

There are also several pad sites around this centre including a service station, a McDonalds 24 hour restaurant, an Autobarn and a Carlovers car-wash²⁰.

¹⁰ Googlemaps drive time

¹¹ Property Council of Australia (2000) NSW Shopping Centre Directory

¹² Shopping Centre News 2021 Mini Guns

¹³ Googlemaps drive time

¹⁴ Floorspace estimated from SixMaps aerial images

¹⁵ Source: centre website and Google street view images

¹⁶ Googlemaps drive time

¹⁷ Property Council of Australia (2000) NSW Shopping Centre Directory

¹⁸ PCA Shopping Centre Directory 2020

¹⁹ Shopping Centre News 2021 Mini Guns

²⁰ Source Google street view



The proposed offer does not include retailers that would directly compete with the Plaza's offering (which serves a different function) and will service a different market to that of Green Valleys Service Station and fast food services.

4.4 Austral Town Centre

The Austral Town Centre is located 3.5 km²¹ west of the subject site, at the Fifteenth Road and Edmondson Avenue intersection. The town centre includes West Hoxton Shopping Village which provides around 2,800sqm of traditional retail floorspace. The centre is anchored by an IGA supermarket of 1,090sqm and includes around 20 specialty shops, a medical centre and allied health facilities. Adjacent to the centre, there is a Home Hardware store which fronts Fifteenth Avenue as well as an independent service station.

There are plans to expand Austral Town Centre to accommodate 20,000–30,000 sqm of retail floorspace with higher order retail and supporting ancillary non-retail uses²². It is anticipated that this will be a staged development, with each stage of development commensurate to market demand and growth.

Approximately 1km to the south of the town centre, some 5km from the subject site there is the Austral Village shopping centre at the Tenth Avenue and Edmondson Avenue intersection. The centre comprises 2,500 sqm of retail floorspace and is anchored by an 800sqm IGA and includes about 10 convenience based tenants (i.e. bottle shop, two cafes, newsagency, medical services and small scale business tenancies). There is also a small provision of retail and commercial floorspace on the western side of Edmondson Avenue opposite the centre²³.

Given the scale of the proposed development at the subject site, distance and function it is unlikely that it will compete with the Austral Town centre and Austral Village as they will effectively be servicing different markets.

4.5 Middleton Grange Shell service station

A Shell service station, with a Coles and Hungry Jacks Restaurant is provided 300m²⁴ south-west of the subject site at the southern side of the Hoxton Park Rd and Cowpasture Rd intersection.

The proposed offer does not include retailers that would directly compete with these businesses.

4.6 Other retail centres

Other retail facilities are also provided at Leppington, Edmondson Park, Preston and Liverpool. However due to differing roles in the retail hierarchy, scale and distance from the subject site, competition between these centre and the proposed centre on the subject site would be insignificant.

4.7 Middleton Grange Village/Town Centre (Proposed)

In addition to aforementioned existing facilities, Middleton Village/Town Centre is proposed 1km²⁵ north of the subject site and will be adjacent to Middleton Grange Public School, along Southern Cross Avenue. Based on the local retail hierarchy strategies the site was earmarked to accommodate a village centre of up to 5,000sqm. It is understood that a proposal has been submitted for the site seeking to extend the scale and role of the centre to a Town centre accommodating up to 36,900sqm of retail and commercial gross lettable area (GLA), including 21,260 sqm of retail floorspace, with up to two full-lined supermarkets and a small scale (4,000sqm) discount department store. The status and likelihood of this proposal proceeding is unknown at this point of time.

²¹ Googlemaps drive time

²² Austral and Leppington North precinct planning report 2013.

²³ Source: centre website and Google street view images

²⁴ Googlemaps drive time

²⁵ Googlemaps drive time



Notwithstanding the above, Middleton Grange Village or Town Centre provides a substantially larger offer than the existing and proposed retail facilities at the subject site and serves a different function in the retail / commercial hierarchy. Middleton Grange Village / Town centre role is to serve the day-to-day and higher order retailing needs of local residents, whilst the proposed uses on the subject site are selling bulky goods which is a different market.

4.8 Summary of key findings

Further to the above, the proposed bulky goods retailing on the subject site will effectively serve a different function in the retail /commercial hierarchy compared to the larger centres at Middleton Grange Village/ Town Centre, Carnes Hill Town Centre, Austral Town Centre and Hoxton Park.

On this basis there will be no impact of the Planning Proposal on surrounding centres.



Disclaimer

1. This report is for the confidential use only of the party to whom it is addressed ("Client") for the specific purposes to which it refers and has been based on, and takes into account, the Client's specific instructions. It is not intended to be relied on by any third party who, subject to paragraph 3, must make their own enquiries in relation to the issues with which this report deals.
2. HillPDA makes no representations as to the appropriateness, accuracy or completeness of this report for the purpose of any party other than the Client ("Recipient"). HillPDA disclaims all liability to any Recipient for any loss, error or other consequence which may arise as a result of the Recipient acting, relying upon or using the whole or part of this report's contents.
3. This report must not be disclosed to any Recipient or reproduced in whole or in part, for any purpose not directly connected to the project for which HillPDA was engaged to prepare the report, without the prior written approval of HillPDA. In the event that a Recipient wishes to rely upon this report, the Recipient must inform HillPDA who may, in its sole discretion and on specified terms, provide its consent.
4. This report and its attached appendices are based on estimates, assumptions and information provided by the Client or sourced and referenced from external sources by HillPDA. While we endeavour to check these estimates, assumptions and information, no warranty is given in relation to their reliability, feasibility, accuracy or reasonableness. HillPDA presents these estimates and assumptions as a basis for the Client's interpretation and analysis. With respect to forecasts, HillPDA does not present them as results that will actually be achieved. HillPDA relies upon the interpretation of the Client to judge for itself the likelihood of whether these projections can be achieved or not.
5. Due care has been taken to prepare the attached financial models from available information at the time of writing, however no responsibility can be or is accepted for errors or inaccuracies that may have occurred either with the programming or the resultant financial projections and their assumptions.
6. This report does not constitute a valuation of any property or interest in property. In preparing this report HillPDA has relied upon information concerning the subject property and/or proposed development provided by the Client and HillPDA has not independently verified this information except where noted in this report.
7. In relation to any valuation which is undertaken for a Managed Investment Scheme (as defined by the Managed Investments Act 1998) or for any lender that is subject to the provisions of the Managed Investments Act, the following clause applies:

This valuation is prepared on the assumption that the lender or addressee as referred to in this valuation report (and no other) may rely on the valuation for mortgage finance purposes and the lender has complied with its own lending guidelines as well as prudent finance industry lending practices, and has considered all prudent aspects of credit risk for any potential borrower, including the borrower's ability to service and repay any mortgage loan. Further, the valuation is prepared on the assumption that the lender is providing mortgage financing at a conservative and prudent loan to value ratio.
8. HillPDA makes no representations or warranties of any kind, about the accuracy, reliability, completeness, suitability or fitness in relation to maps generated by HillPDA or contained within this report.

Liability limited by a scheme approved under the Professional Standards Legislation

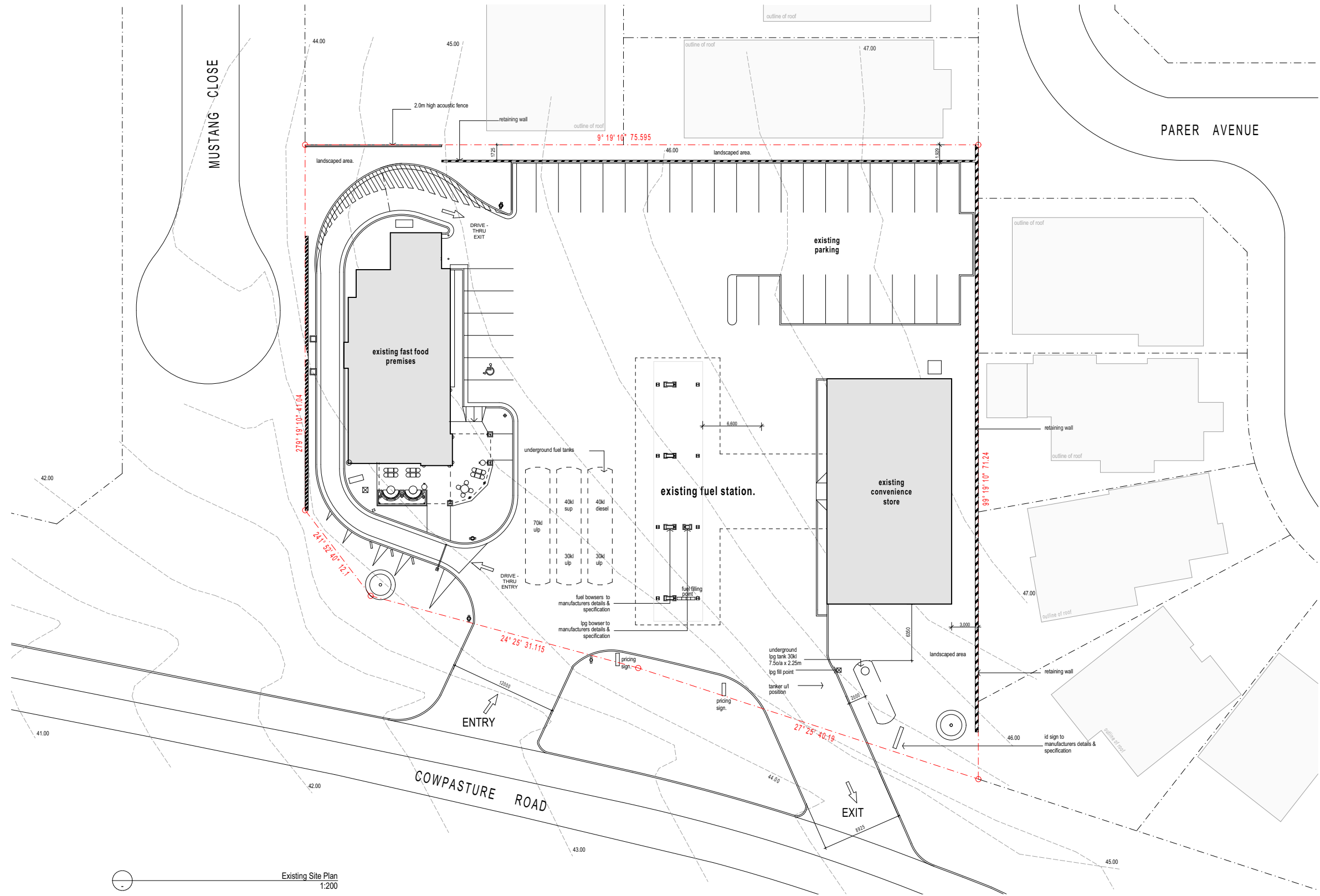
**SYDNEY**

Level 3, 234 George Street
Sydney NSW 2000
GPO Box 2748 Sydney NSW 2001
t: +61 2 9252 8777
f: +61 2 9252 6077
e: sydney@hillpda.com

MELBOURNE

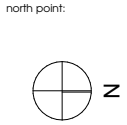
Suite 114, 838 Collins Street
Docklands VIC 3008
t: +61 3 9629 1842
f: +61 3 9629 6315
e: melbourne@hillpda.com

WWW.HILLPDA.COM



□ this drawing is copyright and the property of the author, and must not be retained, copied or used without the authority of mosca perras architects.
□ larger scale drawings and written dimensions take preference.
□ do not scale from drawing
□ all dimensions to be checked on site before commencement of work.
□ all discrepancies to be brought to the attention of the author.

reception@moscaperras.com.au
www.moscaperras.com.au



amendments:

Revision	Description	By	Date
A	Planning Proposal	MR	03.12.21

key plan:

notes:

existing buildings



mosca perras architects

project location client drawing title

Planning Proposal
368-370 Cowpasture Rd, Middleton Grange
Davis Stack
ARCHITECTURAL PLANS
Site Plan - Existing

scale 1:200

project architect drawing no. AP04

job no. 21021 revision A



ENVIRONMENTAL - REMEDIATION - GEOTECHNICAL ENGINEERING - WORK HEALTH & SAFETY - LABORATORIES - DRILLING

PRELIMINARY SITE INVESTIGATION

**368-370 Cowpasture Road,
Middleton Grange NSW**

Prepared for

**Nathan Davis
c/o- Davis Stack
ES8708**

8th March 2023

Aargus Pty Ltd: ACN 050 212 710

HEAD OFFICE: 6 Carter Street, Lidcombe NSW 2141 - PO Box 398 Drummoyne NSW 2047
Tel: 1300 137 038 - Fax: 1300 136 038 - Email: admin@aargus.net - Website: www.aargus.net

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 2 of 39

**CONTROLLED DOCUMENT
DISTRIBUTION AND REVISION REGISTER****DISTRIBUTION LIST**

Copy No.	Custodian	Location
1	Nick Kariotoglou	Aargus Pty Ltd (Library)
2	Nathan Davis	C/- Davis Stack

Note: This distribution list identifies the current custodians of controlled copies of the subject document. It is expected that these custodians would be responsible for:

- the storage of the document
- ensuring prompt incorporation of amendments
- making the document available to pertinent personnel within the organization
- encouraging observance of the document by such personnel
- making the document available for audit

DOCUMENT HISTORY

Document No.	Revision No.	Issue Date	Description
ES8708	0	18/01/2023	Initial Issue
ES8708	1	08/03/23	Revision 1

Approved for release by:



Nick Kariotoglou
Managing Director

Date:

8th March 2023

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 3 of 39

TABLE OF CONTENTS

TABLE OF CONTENTS	3
LIST OF TABLES.....	5
LIST OF FIGURES.....	5
LIST OF APPENDICES	6
ABBREVIATIONS.....	7
EXECUTIVE SUMMARY	8
1 INTRODUCTION	10
1.1 BACKGROUND.....	10
1.2 OBJECTIVE.....	10
1.3 SCOPE OF WORKS.....	11
2 SITE IDENTIFICATION AND DESCRIPTION	12
2.1 SITE IDENTIFICATION.....	12
2.2 SITE INSPECTION	12
2.3 TOPOGRAPHY AND SURFACE WATER DRAINAGE.....	14
2.4 SURROUNDING LAND USES.....	14
3 SITE HISTORY	15
3.1 LAND TITLES	15
3.2 AERIAL PHOTOGRAPHS	16
3.3 EPA RECORDS.....	17
3.3.1 Section 58, CLM Act 1997.....	17
3.3.2 Section 60, CLM Act.....	17
3.3.3 POEO Register.....	17
3.3.4 Unlicensed Premises Regulated by the NSW EPA.....	17
3.4 NSW GOVERNMENT PFAS INVESTIGATION PROGRAM	18
3.5 UNEXPLODED ORDNANCE	18
3.6 NATURALLY OCCURRING ASBESTOS	18
3.7 SAFEWORK NSW RECORDS.....	18
3.8 149 PLANNING CERTIFICATES.....	19
3.9 COUNCIL SEARCH RECORDS.....	19
3.10 INDUSTRIAL PROCESSES AND PRODUCTS MANUFACTURED.....	19
3.11 CHEMICAL STORAGE AND TRANSFER AREAS	20
3.12 PRODUCT SPILL & LOSS HISTORY	20
3.13 DISCHARGES TO LAND, WATER AND AIR	20
3.14 COMPLAINTS HISTORY	21
3.15 HISTORICAL USE OF ADJACENT LAND	21
3.16 DISCUSSION AND SUMMARY OF SITE HISTORY.....	21
4 ENVIRONMENTAL SETTING	22
4.1 SENSITIVE ENVIRONMENTAL RECEPTORS.....	22
4.2 SOIL & GEOLOGY.....	22
4.3 ACID SULFATE SOILS.....	22
4.4 HYDROGEOLOGY	23
5 PREVIOUS ENVIRONMENTAL REPORT	25
6 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN.....	30

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 4 of 39

7	PRELIMINARY CONCEPTUAL SITE MODEL.....	32
7.1	CONCEPTUAL SITE MODEL.....	32
7.1.1	Data Gaps	34
8	CONCLUSION AND RECOMMENDATIONS	35
	LIMITATIONS.....	37
	REFERENCES	39

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 5 of 39

LIST OF TABLES

Table 1: Site Identification.....	12
Table 2: Surrounding Land Uses	14
Table 3: Land Title Information	15
Table 4: Summary of Potential Areas and Contaminants of Concern	30
Table 5: Conceptual Site Model	32

LIST OF FIGURES

Figure 1:	Site Locality
Figure 2:	Site Lot & DP Plan
Figure 3:	Site Features
Figure 4:	Inferred Groundwater Flow Direction

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 6 of 39

LIST OF APPENDICES

APPENDIX A: SITE PLANS

APPENDIX B: SITE PHOTOGRAPHS

APPENDIX C: LAND TITLE INFORMATION

APPENDIX D: CURRENT AND HISTORICAL AERIAL PHOTOGRAPHS

APPENDIX E: PRODUCT INVENTORY SIRA RECORDS

APPENDIX F: SAFEWORK NSW SEARCH

APPENDIX G: COUNCIL AND PLANNING RECORDS 149

APPENDIX H: GROUNDWATER BORE SEARCH

APPENDIX I: PREVIOUS ENVIRONMENTAL REPORTS

APPENDIX J: IMPORTANT INFORMATION ABOUT YOUR REPORT

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 7 of 39

ABBREVIATIONS

ADWG	Australian Drinking Water Guidelines
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground Storage Tank
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
COC	Contaminants of Concern
DLWC	Department of Land & Water Conservation
DNR	Department of Natural Resources
DQOs	Data Quality Objectives
POEO	Protection of the Environment Operations
DSI	Detailed Site Investigation
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
HIL	Health-Based Soil Investigation Level
LGA	Local Government Area
NEHF	National Environmental Health Forum
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NHMRC	National Health and Medical Research Council
OCF	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photo Ionisation Detector
PQL	Practical Quantitation Limit
PSH	Phase Separated Hydrocarbon
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance / Quality Control
RAC	Remediation Acceptance Criteria
RAP	Site Remediation Plan
RPD	Relative Percentage Difference
SAC	Site Assessment Criteria
SCID	Stored Chemical Information Database
SEPP	State Environment Planning Policy
SMP	Site Management Plan
SVC	Site Validation Criteria
TCLP	Toxicity Characteristics Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VHC	Volatile Halogenated Compounds

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 8 of 39

EXECUTIVE SUMMARY

Aargus Pty Ltd (Aargus) was appointed by Mr Nathan Davis (the client) to undertake a Preliminary Site Investigation (PSI) for the property located at 368-370 Cowpasture Road, Middleton Grange NSW (the site). The site is proposed to be rezoned from residential existing use rights to commercial zoning with land-use remaining unchanged as a service station and fast food outlet. This is a change to less sensitive land use although the land use remains the same.

A PSI was requested by the client to determine the potential for onsite contamination. This report shall provide a preliminary assessment of any site contamination and, if required, provide a basis for a more detailed investigation.

At the time of the inspection (December 2022), the site was used for commercial purposes including a BP Service Station and Fast Food outlets including KFC and Pizza Hut. The site was operational with approximately 95% sealed with concrete, with unsealed areas only relating to garden bed areas around the perimeter. General rubbish and housekeeping showed rubbish located in gardens and carparking areas.

The land title and aerial information provided suggested that no significant changes had occurred on site over the last 20 years. In 2005, a Phase II Environmental Assessment was conducted (back then Caltex) as part of a due diligence for sale. Three groundwater wells were installed as part of this assessment with wells located on the site boundaries thus looking for gross pollutants. Inspection of all 3 wells when opened showed no HC odours evident.

The findings of the assessment indicated the following areas of potential environmental concern:

- Delineation of asbestos in fill underlying sealed surfaces.
- Hydraulic gradient of groundwater flow and analyte concentrations of GW1 the most downgradient location from USTs.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 9 of 39

The contaminants that may be present in some of these areas were considered to be of moderate to low significance in terms of risk to the human and environmental receptors identified. The historical Detailed Site Investigation (DSI) provided adequate information to determine if gross pollutants existed on the site and as the site is sealed, the main areas of concern being a hotspot of asbestos that has been delineated to one location is of no concern in-situ. The groundwater wells showed no petroleum hydrocarbon odours in all wells. GW1 was found to be constructed in a different geological medium to the other 2 wells. This means that GW1 may exist outside of the tank farm area or not constructed deep enough. With GW1 well being dry, the product inventory of records added to the fact that no product loss had occurred plus the Service Station complex is relatively new and new fibreglass double skinned tanks were installed when they were commissioned allowing for detection of product loss issues which provides comfort that no gross contamination exists.

As part of the service stations compliance, UPSS monitoring takes place at regular intervals. As 1 of the 3 groundwater monitoring wells has not been installed in accordance with UPPSS guidelines, it is recommended that prior to the next round of compliance UPSS reporting requirements, a groundwater well be installed to depth at or near the location of GW1. Whilst UPSS compliance monitoring and reporting does not always include analytical sampling, we recommend that a round of groundwater analytical sampling on all wells be conducted during the next UPSS reporting event to regulators to confirm the groundwater concentrations as compared to guidelines. It is recommended that only the first post GW1 re-installation sampling event for groundwater be conducted in approximately 3 months and dependent upon results meeting guidelines, no further sampling events other than UPSS compliance occur.

Based on the information collected during this investigation and in reference to rezoning from residential to commercial (less sensitive land use), **the site is suitable for the proposed land use and rezoning.**

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 10 of 39

1 INTRODUCTION

1.1 Background

Mr Nathan Davis (the client) to undertake a Preliminary Site Investigation (PSI) for the property located at 368-370 Cowpasture Road, Middleton Grange NSW (the site). The site is proposed to be rezoned from residential existing use rights to commercial zoning with land-use remaining unchanged as a service station and fast food outlet. The location of the property is presented in Figure 1 of Appendix A.

The site is proposed to be rezoned from residential existing use rights to commercial zoning with land-use remaining unchanged as a service station and fast food outlets.

A site investigation was requested by Frank Mosca as part of the Council Application Process.

1.2 Objective

The primary objectives of this PSI are as follows:

- Identify potential areas where contamination may have occurred from current and historical activities;
- Identify potential contaminants associated with potentially contaminating activities;
- Assess the potential for soils and groundwater to have been impacted by current and historical activities; and
- Assess the suitability of the site for commercial rezoning keeping existing land use rights, based on its current condition and the findings of this investigation.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 11 of 39

1.3 Scope of Works

The scope of works for this PSI includes:

- Review of the physical site setting and site conditions based on a site inspection, including research of the location of sewers, drains, holding tanks and pits, spills, patches of discoloured vegetation, etc. (where applicable);
- Research and review of the information available, including previous environmental investigations, current and historical titles information, review of aerial photographs, groundwater bore searches, EPA notices, council records, SafeWork NSW records, anecdotal evidence, site survey and site records on waste management practices;
- Development of a preliminary Conceptual Site Model (CSM) to demonstrate the interactions between potential sources of contamination, exposure pathways and human/ecological receptors identified; and
- Recommendations for additional investigations should any data gaps be identified or possible strategies for the management of the site, where relevant.

This report was prepared with reference to the NSW Environment Protection Authority (EPA) "*Guidelines for Consultants Reporting on Contaminated Sites*" (2020).

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 12 of 39

2 SITE IDENTIFICATION AND DESCRIPTION

2.1 Site Identification

Site identification information and land use is summarised in the table below.

Table 1: Site Identification

Lot and DP Number (Address)	Lot 4 in DP1052704 in NSW)
Coordinates (SE corner)*	Latitude: - 33.923480, Longitude: 150.848673
Approx. Site Area	3,900m ²
Local Government Area	Liverpool
Parish	Cumberland
Current Land Zoning**	Residential (existing use rights)
Proposed Land Use	Commercial
Current Site Owner	Cowpasture Road (2005) Pty Ltd
Site End Users	General Public (adults & children), workers

Notes: * refer to <http://maps.six.nsw.gov.au/>

** refer to Liverpool Zoning Map

The site boundary is presented in Appendix A.

2.2 Site Inspection

A site visit was carried out in December 2023 by an Aargus Principal scientist to inspect the site for any potential sources of contamination and document any observations made regarding the current site conditions. At the time of the site inspection, the following observations were made:

- The site is trapezoidal (near square) in shape and used for commercial purposes.
- The site is comprised of a service station and fast food outlet and is occupied by a main service station and connected Pizza Hut structure on the central northern

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 13 of 39

boundary of the site, bowzers and tank farm within the centre of the site and a KFC fast food drive through and eat in restaurant on the southern boundary.

- Carparking is found to the western side of the land and shown to contain lots of rubbish and litter (not of significant concern).
- The main access to the site was along Cowpasture Road, on the eastern boundary with Fifteenth Avenue bounding the site along the southern boundary.
- Small planting areas and garden areas were located on site boundaries and only make up approximately 5% of the otherwise totally sealed surfaces. Some small cracks in the pavement throughout the site were observed on the sealed surface3s with no significant staining or olfactory HC evidence of gross pollutants.
- The site slope was found to flow from north west to south east.
- Stormwater drains were found to be clear of debri and no staining or olfactory evidence of gross pollutants flowing into drains.
- Three groundwater wells were found (gatic covers) and opened and inspected with PID readings showing zero evidence of HC odour (zero readings). 1 well was located on the western boundary in the parking area near the central of the western boundary and 2 wells were located downgradient and on the eastern and southeastern boundary with the groundwater well located closest to KFC found to be dry.
- Site boundaries were defined by metal fences, Cowpasture Road and Fifteenth Avenue.
- No surface standing water was noticed at the site with the inspections of the 3 groundwater wells showing the well closest to KFC being dry and the well also on the eastern boundary downgradient of the tanks having groundwater approximately 5.5m bgl and the well located on the western boundary having a groundwater level approximately 3.5m bgl.
- USTs were located in the centre of the site including dipping points and filling points for the three (3) USTs. Bowzers were located underneath the canopy with no staining observed on the majority of the sealed surface.

The site features are presented in Appendix A. Site photographs are included in Appendix B.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 14 of 39

2.3 Topography and Surface Water Drainage

The following observations were made during the site inspection carried out in December 2022:

- The site topography is generally flat, with a gentle slope towards the southeast towards Cowpasture Road (along the eastern perimeter) at approximately 5% slope.
- Stormwater runoff from the site is expected to flow in a similar direction captured by stormwater infrastructure along Cowpasture Road and Fifteenth Avenue.

Copies of the topographical survey plan can be found in Appendix A.

2.4 Surrounding Land Uses

The surrounding land uses identified are described in the table below:

Table 2: Surrounding Land Uses

Orientation	Description
North	Low Density Residential dwellings (upgradient)
East	Cowpasture Road then low density residential dwellings
South	Electrical Substation commercial
West	Commercial / Solar office then residential

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 15 of 39

3 SITE HISTORY

3.1 Land Titles

A review of historical documents held at the NSW Department of Lands offices was undertaken to identify the current and previous land owners, and potential land uses. The results of the title search are summarised in the following table.

Table 3: Land Title Information

Date Purchased/Owned	Registered Proprietor	Occupation	Possible land Use
22.06.1905	Elizabeth Maud Murray	Married Woman	Rural/residential
07.04.1908	George Alfred Murray	Hotel Assistant	Rural/residential
(1908 to 1948)	Mary Jane Murray	Spinster	Rural/residential
08.11.1948	Leslie Grimson	Carrier	Rural/residential
14.01.1949	Frederick Jarman	Labourer	Rural/residential
28.06.1958	Richard Bell	Manager	Rural/residential
(1958 to 1967)	Marie Hynes Bell	Married Woman	Rural/residential
06.10.1967	Laurence John Birdsall	Advertising Artist	Rural/residential
(1967 to 1969)	Caroline Anne Birdsall	Married Woman	Rural/residential
18.04.1969	Nicole Zappacosta	Concretor	Rural/residential
(1969 to 1972)	Anotnietta Zappacosta	Married Woman	Rural/residential
21.07.1972	Agazio Mosca	Factory Worker	Rural/residential
(1972 to 1991)	Maria Mosca	Married Woman	Rural/residential
29.08.1991	Frank Paul Mosca		Rural/residential
(1991 to 1999)	Jessie Mosca		Rural/residential
05.11.1999	Mosgaz Pty Limited		Service station and Fast food outlets
15.01.2004	# Karim Investments Pty Ltd		Service station and Fast food outlets

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 16 of 39

In summary, the land title information provided suggested that the site was owned by individual owners and used for residential and/or rural purposes up until 1999 where the site was developed into a Service Station and fast food outlets.

A copy of the land titles information can be found in Appendix C.

3.2 Aerial Photographs

Selected aerial photographs obtained from the NSW Department of Lands were reviewed to describe the site features and surrounding areas at various timelines. A summary of the review was conducted focusing on the years 1947, 1970, 1986, and 2002. The 1947 aerial photograph shows that the subject site is vacant with a few scattered trees and other plants. The surrounding area is also vacant and appears to be rural in nature. The 1970 aerial photograph shows that a small single storey home has been constructed in the south west corner of the site. The north eastern corner of the site appears to have a paddock or be agricultural in nature while the remainder of the site is covered in trees. The surrounding areas are rural in nature, with trees occupying large areas of the land.

The 1986 aerial photograph shows that no new construction developments have taken place at the subject site. However the majority of the trees have been removed resulting in the expansion of the paddock/agricultural portion of the site. The majority of the surrounding area has not undergone significant change with the exception of a few new buildings scattered throughout the area and the improvement of the surrounding roads. The 2002 aerial photograph shows significant change to the subject site and the surrounding area. The residential building that previously occupied the southern portion of the site has been demolished and replaced by a commercial building that is currently occupied by KFC. The northern half of the site has been redeveloped as a service station and the majority of the remainder of the site has been paved. The surrounding area, particularly to the east, south east and south of the site has been redeveloped from rural properties to single and double story residential buildings.

Copies of the aerial photographs are included in Appendix D.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 17 of 39

3.3 EPA Records

3.3.1 Section 58, CLM Act 1997

The NSW EPA publishes records of contaminated sites under Section 58 of the Contaminated Land Management (CLM) Act 1997. The notices relate to investigation and/or remediation of site contamination considered to pose a significant risk of harm under the definition in the CLM Act. However, it should be noted that the EPA record of Notices for Contaminated Land does not provide a record of all contaminated land in NSW.

A search of the EPA database revealed that the subject site is not listed.

3.3.2 Section 60, CLM Act

The NSW EPA also published records of the sites notified under Section 60 of the CLM Act. The published document as of the December 2022 revealed that the site was not listed.

3.3.3 POEO Register

The NSW EPA also have a public register under section 308 of the Protection of the Environment Operations Act 1997 (the POEO Act) that contains the licensed premises.

A search of the POEO Register revealed that the site was not listed.

3.3.4 Unlicensed Premises Regulated by the NSW EPA

The NSW Environment Protection Authority (EPA) maintain records of the premises where the NSW EPA is still the Appropriate Regulatory Authority (ARA) that are no longer required to be licensed under the Protection of the Environment Operations Act 1997 (POEO Act).

A search of the NSW EPA Records revealed that the site is not listed.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 18 of 39

3.4 NSW Government PFAS Investigation Program

A search of the EPA database revealed that the site is not listed on the NSW Government PFAS Investigation Program and/or the Contaminated Land Database.

<https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program>

3.5 Unexploded Ordnance

A review of the Department of Defence website for Unexploded Ordnance showed no records for the site.

<https://www.defence.gov.au/UXO/Where/Default.asp>

3.6 Naturally Occurring Asbestos

A review of the SafeWork NSW website showed that the site was not located in an area where naturally occurring asbestos might be located.

<https://www.safework.nsw.gov.au/resource-library/asbestos-publications/naturally-occurring-asbestos/residing-in-areas-of-naturally-occurring-asbestos-factsheet2>

3.7 SafeWork NSW Records

A WorkCover Dangerous Goods Search was conducted for the site to identify any dangerous chemicals that are or have been stored on the site. The WorkCover documents indicated that there was a licence for a 180 kg above ground Liquid petroleum gas tank from 2003 but there was no record of the petrol and diesel USTs observed on site.

A copy of the WorkCover Search results is attached in Appendix F.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 19 of 39

3.8 149 Planning Certificates

The 149(2) Certificates did not indicate any items of concern arising under the Contaminated Land Management Act 1997 under the Environmental Planning and Assessment Act. The certificate does however include a notation under Environmentally Significant Land, indicating that the site is located within rurally zoned land which may result in noise, dust and odours that may be offensive. The land is also subject to the Liverpool Local Environment Plan 1997, a number of Development Control Plans and a number of State Environmental Planning Policies (SEPPs).

Reference should be made to the Certificate included in Appendix G for the full details of which Development Control Plans and SEPPs are relevant.

3.9 Council Search Records

The Liverpool Council database was reviewed relating to the site and the search revealed the only significant record of application was in 1999 for the operations of a Service Station.

3.10 Industrial Processes and Products Manufactured

A review of the industrial processes and/or products manufactured at the site was conducted, and a summary of the information pertaining to the site only relate to operations of a service station.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 20 of 39

3.11 Chemical Storage and Transfer Areas

A review of the former chemical storage and transfer areas and/or products manufactured at the site was conducted, and a summary of the information pertaining to the site is provided below:

- One ULP
- One LPG
- One Premium unleaded 98
- One Diesel \One ULP E10
- 4 Pump bowsers and associated piping

3.12 Product Spill & Loss History

It was indicated by the client, that to their knowledge no serious land or water contamination had occurred.

The majority of the site is currently either occupied by a building and/ or sealed surfaces. At the time of the inspections, the sealed surfaces of the concrete slab were in generally good condition with only minor cracks observed. In addition, there were no visible signs of oil and/or chemical staining, indicating that any surface spills (if they did occur at all) were cleaned up immediately and did not appear to penetrate the existing slab.

A review of SIRA details showed product inventory to have no loss and tank and liune tests also showed tanks to be tight and lines pass vacuum tests.

3.13 Discharges to Land, Water and Air

No discharges to land, water and air were observed within the site.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 21 of 39

3.14 Complaints History

There were no complaints registered for the site.

3.15 Historical Use of Adjacent Land

It was indicated by the client that to their knowledge, the adjacent lands to the site have been used primarily for residential land use since the service station became operational.

3.16 Discussion and Summary of Site History

Based on available information, the site historical usage showed the only potential areas of concern are based upon current operations as a service station. The service station has been operating as a Service station for 20 years with new tanks double skinned installed and UPPS procedures put in place.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 22 of 39

4 ENVIRONMENTAL SETTING

4.1 Sensitive Environmental Receptors

The nearest watercourse is a canal, approximately 300m east of the site, that is a tributary of Hinchinbrook Creek located approximately 0.5km from the site. Hinchinbrook Creek flows to a network of small watercourses in the Hoxton Park area located a few kms away.

4.2 Soil & Geology

Reference to the Penrith 1:100 000 Geological Series Sheet indicates the site is on the boundary between Bringelly Shale, of the Wianamatta Group and recent (Quaternary) fluvial/ estuarine deposits. Bringelly Shale weathers to form highly plastic clays. Bringelly Shale consists of shale, carbonaceous claystone, laminite, fine to medium-grained lithic sandstone with rare coal. Bringelly Shale typically weathers to form clays of high plasticity and low permeability, which impede the migration of contaminants, if any. The recent (Quaternary) fluvial/ estuarine deposits consist of medium grained sand, clay and silt. These are likely to be underlain by Ashfield Shale. Field investigations indicated that the geological profile of the site is consistent with Bringelly Shale.

4.3 Acid Sulfate Soils

To determine whether there is a potential for acid sulphate soils to be present at the site, reference was made to the NSW Department of Land & Water Conservation (DLWC) *Acid Sulphate Soil Risk Maps* (Edition Two, December 1997, Scale 1:250,000). A review of the map indicated that there is a “low probability” of occurrence of acid sulphate soil materials at the site, and the presence of acid sulphate soils was considered to be unlikely.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 23 of 39

4.4 Hydrogeology

Groundwater was observed in two of the piezometers during the site inspection from pre-existing wells at a depth of 3.5 m below ground level (bgl) in BH3 and at a depth of 5.1 m bgl in BH2. BH1 was found to be dry. All wells had no evidence or signs of HC odours.

The registered groundwater bores were unlikely to be used for human consumption since the site is not located within the SEPP boundary for the Sydney Drinking Water Catchment.

A Department of Planning and Natural Resources (DIPNR) Groundwater Bore Search was conducted in and around the subject property. There were four upgradient groundwater bores (GW104078-GW104081) which were located approximately 5.3 km northwest of the site. These bores were drilled for monitoring purposes to 30 m but no groundwater information was recorded.

There are several monitoring groundwater bores located down gradient of the site. GW103799 — GW104805 are located approximately 5.9 km east of the site and were drilled to 3 — 5 m but no groundwater information was recorded. GW101280 and GW101283 were also located near this area with a groundwater bearing zone identified between 1 and 6 m.

A single, 9 m dewatering bores is located approximately 3.2 km south east of the site (GW102015) which did not encounter groundwater.

Three bores are located approximately 5.5-6.5 km south of the site. Two of these bores (GW058734 and GW058735) are for irrigation purposes and encountered a groundwater bearing zone between 152 and 167 m below the surface. The record also indicates that this water was saline. GW104018 is a Test Bore where groundwater was encountered at 19-20 m, 29-30 m and 172-173 m below ground level.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 24 of 39

It is anticipated that groundwater may exist around 4-5m around the site which would interact with the Hinchinbrook and Cabramatta Creeks located between the subject site and the above-mentioned down gradient groundwater bores.

A copy of the groundwater bore search records can be found in Appendix H.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 25 of 39

5 PREVIOUS ENVIRONMENTAL REPORT

A previous Phase 2 report was conducted by Douglas Partners in 2005 on the then Caltex service station site. The investigation comprised a site inspection, a review of site history, environmental sampling from eleven locations and the installation of three piezometers for the sampling of groundwater.

A summary of findings is summarized below.

The majority of the site was covered in concrete which was typically 0.2 m thick. The perimeter of the site, particularly along the eastern and southern boundaries also had small landscaped areas which were covered in a layer of red gravel and woodchip. The filling material observed on the site generally consisted of mottled red, orange and light grey silty clay filling and was typically limited to surficial deposits typically only extending to a maximum depth of 0.5 m, and 1.0 m in test bore BH2. Building rubble was not observed in the filling; however, subsequent analysis of the filling identified asbestos in Test Bores BH7 (see section 10.2.5 of Appendix I – previous report). The filling was also free of any chemical odours and/or staining which may typically indicate that there had been surficial leaks or spills from the bowisers, fuel lines or USTs. The natural material consisted of mottled orange, red and light grey silty clay, the grey brown shaly clay and the grey brown shale. The natural material was free of chemical odours and staining which indicated that it was unlikely that there are any leaks present in the UST's, however this can not be confirmed without conducting UST integrity testing which was outside the scope of the current investigation.

The detected levels of contaminants within the soils and groundwater were generally low and well within the site assessment criteria. It should be noted that asbestos was detected in the in one sample BH7/0.3-0.5, however this result is considered insignificant due to the small amount of asbestos detected (below the practical quantification limit of the analytical method), the limited extent of the detected asbestos and the concrete covering creating an effective capping covered in a concrete seal. It is therefore anticipated that this asbestos contaminated material does not pose a significant threat to human health and

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 26 of 39

as such does not require any remediation, however further investigation may be warranted in the future if this area were to be disturbed

They found the analytical results, indicated heavy metal concentrations in the soil samples to generally be low and well within Health-based site criteria, for commercial and/or industrial sites.

The detected levels of TRH and BTEX from all samples analysed from both the filling and natural materials both up and down gradient of the USTs were below the practical quantification limits of the laboratory. Therefore it is considered that TRH and BTEX in soils are well with the adopted site assessment criteria and that the site is not negatively impacted by TRH and BTEX.

Results for total level PAHs and Benzo(a)pyrene in both the filling and natural material below the detection limits in all samples analysed and thus well within the health-based criteria for commercial and industrial sites.

Samples analysed for OCP, OPP, PCB, and phenols in both the filling and the natural material. are well within the adopted assessment criteria for commercial/industrial sites.

Asbestos was not observed in filling materials during drilling and logging. However, during subsequent laboratory analysis traces of possible "chrysotile asbestos" was detected in one near surface sample BH7/0.3-0.5 which was collected in the surficial shale immediately beneath the concrete slab.

It should be noted that the asbestos detected was "below the practical quantification limit of the analytical method" and therefore cannot be confirmed with scientific certainty. It should be further noted that the bore logs indicated the asbestos was detected with the surficial shale, which is unlikely to contain asbestos. It may, however, have been carried into the shale from the gravel base coarse by the auguring action during drilling.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 27 of 39

In view of the noted uncertainty of the traces of asbestos identified, three additional analysis were undertaken on sample BH7/0.3-0.5 for asbestos. No asbestos was detected in any of the three additional replicate sub samples of BH7/0.3-0.5.

Therefore in view of the following facts:

- The detected asbestos was below the practical quantification limit of the laboratory;
- Asbestos was not detected in any of the other test bores;
- No asbestos was detected in the three retests conducted on sub samples of BH7/0.3-0.5;
- The test bore logs indicate that the sample was natural shale which would not likely to contain asbestos; and
- No asbestos or building rubble was visually detected during drilling.

It is considered that the detected asbestos is insignificant and does not pose a serious threat of human harm.

In any case, given that a 0.2 m thick layer of concrete is present on the surface, the asbestos contaminated material is effectively capped and does not pose a significant threat to human health and therefore does not pose a significant threat to human health and therefore does not require any remediation. It is therefore recommended that if this area is disturbed in the future that additional testing should be conducted to confirm the presence and/or extent of asbestos present. If subsequent analysis were to confirm the presence of asbestos then the asbestos contaminated material it would need to be removed and validated by an Occupational Health and Safety (OHS) Consultant.

Groundwater was shallowest in test Bore BH3 and deepest in test bore BH1 which was dry.

The difference in the groundwater level may be the result of either:

- The test bores where the groundwater was deepest (BH1 and BH2) were down gradient of the USTs which may have impeded groundwater flow and subsequently locally depressed the groundwater; and/or

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 28 of 39

- Test bore BH3 was adjacent to a 2-2.5 m cutting and retaining wall, which might indicate that the original topography was approximately 2 m higher than current. If this were the case then under natural conditions the depth of groundwater would be approximately 5.5 m and would be consistent with BH2.

Furthermore during groundwater sampling there was no separate phase observed.

It is considered that the groundwater system discharges into a fresh water system of creeks and rivers i.e. Hinchinbrook and Cabramatta Creeks, so therefore the relevant guidelines for assessing the groundwater conditions are the ANZECC 2000 trigger values for fresh waters for protection of 95% of species.

Results of groundwater samples for heavy metals in Test Bores BH2 and BH3 indicated concentrations of heavy metals that were generally low and well within the trigger values for groundwater, viz. ANZECC 2000 trigger values for fresh waters for protection of 95% of species.

Results for TRH and BTEX were compared to the Groundwater Intervention Levels (GILs) as set out in section 8.2. Results indicated that TRH and BTEX were below the practical quantification limits of the laboratory and hence within the adopted site assessment criteria. This result, particularly in test bore BH2 which is down gradient of the UST would indicate that there are no signs of leakage from the USTs.

Results for OCPs, OPPs and PAHs were compared to the Groundwater Intervention Levels (GILs) as set out in section 8.2. OCPs, OPPs and PAHs were below the detection limits in all samples analysed. It is therefore considered that the groundwater at the site is not significantly impacted by OCPs, OPP or PAHs.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 29 of 39

They concluded:

The report was conducted for pre-sale purposes only, with no new developments planned for the site which will continue to be used as a service station and a fast food outlet. For contamination assessment purposes the site had been assessed using site assessment criteria for commercial/industrial sites, supplemented by threshold concentrations for sensitive land use for petroleum hydrocarbons. The detected levels of contaminants within the soils and groundwater were generally low and well within the site assessment criteria. It was noted that asbestos was detected in the in one sample BH7/0.3-0.5, however this result is considered insignificant due to the small amount of asbestos detected (below the practical quantification limit of the analytical method), the limited extent of the detected asbestos and the concrete covering creating an effective capping covered in a concrete seal. It is therefore anticipated that this asbestos contaminated material does not pose a significant threat to human health and as such does not require any remediation, however further investigation may be warranted in the future if this area were to be disturbed.

No visual or analytical evidence of contamination was noted in any of the test bores, including those located down-gradient of the UST's.

Based on the site history, site observations and laboratory results, no signs of gross contamination were noted. On this basis, it was considered that the site was suitable for continued service station use and is suitable for continued commercial/industrial land-use.

If the site is to be developed for a more sensitive land use, and in particular if the concrete capping were to be removed then the asbestos contaminated material identified in test bore BH7 would need further assessment

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 30 of 39

6 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

Based on the site inspection, site history, previous reports and review of available information from the historical Phase 2 assessment and desktop study, the potential Areas of Environmental Concern (AEC) and their associated Contaminants of Concern (CoC) for the site were identified. These are summarised in the following table.

Table 4: Summary of Potential Areas and Contaminants of Concern

Potential AEC	Potentially contaminating activity	Potential CoCs	Likelihood of Site Impact	Justification
Entire site	Importation of fill material from unknown origin	Metals, TPH, BTEX, PAH, OCP, PCB, Phenols, Cyanides, Asbestos	Low	Based on the site observations and site topography, the presence of imported fill material is likely to be minimal.
	Potential for pesticides to have been sprayed or injected on or underneath concrete slabs	OCP	Low	The site is not known for having been used for agricultural purposes from the 1950s when OCPs were first introduced into Australia. If use of OCPs has occurred, the impact is likely to have been localised and limited to the topsoil layer from previous residential use.
Vehicle Parking	Leaks from vehicles	Metals, TPH, BTEX, PAH	Low	Site inspection is needed to confirm if any staining is present
Former Building Structures	Potential Asbestos/Fibro Features from historical residential housing	Asbestos	Low	If present, likely within the near surface soils only.
Chemical Storage	Leaks from vehicles	Metals, TPH, BTEX, PAH, Phenols	Low	Sealed surfaces were noted on site. The majority of the sealed surfaces appeared to be in good condition. One sample was found and delineated
Car parking	Leaks from vehicles	Metals, TPH, BTEX, PAH	Low	Sealed surfaces were noted on site. Majority of the sealed surface appeared to be in good condition.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 31 of 39

Potential AEC	Potentially contaminating activity	Potential CoCs	Likelihood of Site Impact	Justification
Refuelling area under the canopy extending south from the main building Former car wash and detailing area under the canopy area extending west from the main building	Leaks from vehicles, USTs, bowsers, and associated pipelines	Metals, TPH, BTEX, PAH, phenols	Moderate to High	Given the motor oil and 'black sludge' reported by the adjacent site and Council's refusal to grant a permit for further car washing operations on the site in 2006, it is likely that the USTs and associated infrastructure had leaked sometime in the past.
Building Structures	Potential Asbestos/Fibro Features	Asbestos	Low	If present, these will be removed by licensed contractors.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 32 of 39

7 PRELIMINARY CONCEPTUAL SITE MODEL

7.1 Conceptual Site Model

The Preliminary Conceptual Site Model (CSM) presented in the table below provides a representation of the potential risks associated with the linkages between the following elements:

- Potential contamination sources and their associated contaminants of concern identified in Section 7. Only potential areas of concern with a significance rating of low to high were included;
- Potential human receptors that may be impacted by site contamination are current and future end-users, construction workers and the general public within the immediate vicinity;
- Potential environmental receptors identified in Section 4;
- Potential exposure pathways; and
- Whether each source-pathway-receptor pollution linkage are complete, limited or not present, based on current and future site conditions.

Table 5: Conceptual Site Model

Potential Sources	Potential Receptor	Potential Exposure Pathways	Complete Linkages	Risk	Justification
Hydrocarbon spills and leakages from service station operations mainly in the northern and centre of the site.	Site users or the general public	Dermal contact, inhalation or ingestion of exposed impacted soils	Limited (Current)	Low	Direct contact with impacted soils is limited to the small garden areas at the western portion of the site.
			No (Future)	Negligible	If present, contaminated soils are unable to be contacted unless sealed surfaces or redevelopment is to occur.
	The aquatic ecosystems at the nearby canal discharging into the Hinchinbrook	Migration of impacted groundwater and surface water run-off	Yes (Current)	Low	No obvious sources of contamination were observed on site that could migrate off site with surface water run-off. New tanks would limit the

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 33 of 39

Potential Sources	Potential Receptor	Potential Exposure Pathways	Complete Linkages	Risk	Justification
	system				future occurrence as well as meeting UPSS monitoring requirements.
			No (Future)	Low	If present, contaminated soils and groundwater is likely to be remediated and any remaining residual contamination would likely be at acceptable concentrations upon reaching the canal
	Underlying Bedrock Aquifer	Leaching and migration of contaminants through groundwater infiltration	Limited (Current)	Low to Moderate	Depending on the thickness of the expected confining clay layer and leachability of metals and organic compounds, vertical migration of contaminants may be limited. However, suspected sub-surface hydrocarbon contamination by service station operations leakages may be present and extend into the bedrock aquifer.
			No (Future)	Low	If present, contaminated soils and groundwater is likely to be remediated and any remaining residual contamination would likely be at acceptable concentrations upon reaching the underlying aquifer
Contaminated soil from placement of uncontrolled fill across the site.	Site users or the general public	Dermal contact, inhalation or ingestion of exposed impacted soils	Limited (Current)	Low	Direct contact with impacted soils is limited to the garden areas at the northwestern portion of the site.
			No (Future)	Negligible	If present, contaminated soils are likely to be remediated and removed with the remaining soils from the basement excavation level for off-site disposal.
	The aquatic ecosystems at the nearby canal discharging into the Cooks River	Migration of impacted groundwater and surface water run-off	Yes (Current)	Low	No obvious sources of inorganic contamination were observed on site that could migrate off site with surface water run-off.
			No (Future)	Negligible	If present, contaminated soils and groundwater is likely to be remediated and any remaining residual

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 34 of 39

Potential Sources	Potential Receptor	Potential Exposure Pathways	Complete Linkages	Risk	Justification
					contamination would likely be at acceptable concentrations upon reaching the canal
	Underlying Bedrock Aquifer	Leaching and migration of contaminants through groundwater infiltration	Limited (Current)	Low	Due to the existing hardstanding cover and depending on the thickness of the expected confining clay layer and leachability of metals and other inorganics vertical migration of contaminants is likely to be limited.
			No (Future)	Low	If present, contaminated soils and groundwater is likely to be remediated and any remaining residual contamination would likely be at acceptable concentrations upon reaching the underlying aquifer

7.1.1 Data Gaps

Based on the CSM, the following data gaps were identified with respect to the pollution linkages identified:

- The presence and thickness of imported fill material, if any.
- Confirmation if asbestos that has been delineated has occurred from current and/or historical site activities through detailed collection and laboratory analysis of soil.
- The presence and quality of groundwater is currently known in 2 of the 3 wells with no directional flow (hydraulic gradient) available. Whilst no HC odours were present in wells, GW1 was not constructed deep enough and as such the most downgradient well does not have information allowing conclusively the non existence of HC in groundwater and may be impacted by historical leakages from service station and car washing operations on site.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 35 of 39

8 CONCLUSION AND RECOMMENDATIONS

The contaminants that may be present in some of these areas were considered to be of moderate to low significance in terms of risk to the human and environmental receptors identified. The historical Detailed Site Investigation (DSI) provided adequate information to determine if gross pollutants existed on the site and as the site is sealed, the main areas of concern being a hotspot of asbestos that has been delineated to one location is of no concern in-situ. The groundwater wells showed no petroleum hydrocarbon odours and still with GW1 well being dry, the product inventory of records added to the fact that no product loss had occurred provides comfort that no gross contamination exists.

As the site is proposed to have a change of land use to a less sensitive land use (i.e. residential to commercial), the information collected during this investigation and in reference Clause 4.6 of the State Environmental Planning Policy (Resilience and Hazards) 2021, the site is suitable for a commercial land use. If however the site is proposed to be redeveloped and sealed surfaces removed as part of this process, a further supplementary DSI would be recommended.

Further, as part of the service stations operational compliance, UPSS monitoring for the NSW EPA takes place at regular intervals (every 6 months or yearly reporting cycle). As 1 of the 3 groundwater monitoring wells has not been installed in accordance with UPPSS guidelines, it is recommended that prior to the next round of compliance UPSS reporting requirements, a groundwater well be installed to the appropriate depth within the appropriate geology at or near the location of GW1. Whilst UPSS compliance monitoring and reporting does not usually include analytical sampling, we recommend that a round of groundwater analytical sampling on all wells be conducted during the next UPSS reporting event to regulators to confirm the groundwater condition as compared to regulatory guidelines. It is recommended that only the first post GW1 groundwater well re-installation sampling event for groundwater be conducted in approximately 3 months and dependent upon results meeting guidelines, no further sampling events other than UPSS compliance occur.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 36 of 39

Based on the information collected during this investigation and in reference to rezoning from residential to commercial (less sensitive land use), **the site is suitable for the proposed land use and rezoning.**

Thank you for the opportunity to undertake this work. We would be pleased to provide further information on any aspects of this report.

For and on behalf of

Aargus Pty Ltd



Nickolaos Kariotoglou

BAppSc, GDipMan, MBA, CPM, FAMI
Senior Principal Scientist
Managing Director

Peer Reviewed by



Miguel Zavaleta-Romero

CEnvP Certified No. 945
Contaminated Land Specialist: SC40946



8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 37 of 39

LIMITATIONS

The Aargus assessment is based on the result of limited site investigations and sample testing. Neither Aargus, nor any other reputable consultant, can provide unqualified warranties nor does Aargus assume any liability for site conditions not observed or accessible during the time of the investigations.

Despite all reasonable care and diligence, the materials encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. There is always some disparity in subsurface conditions across a site that cannot be fully defined by investigation. Hence it is unlikely that measurements and values obtained from sampling and testing during environmental works carried out at a site will characterise the extremes of conditions that exist within the site. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions, truck movement or contractor movement of soils and other events, e.g. groundwater movement and or spillages of contaminating substances. These changes may occur subsequent to Aargus investigations and assessment.

This report and associated documentation and the information herein have been prepared solely for the use of the client at the time of writing the report and is valid (for the purposes of management or transport of material) for a period of one month only from the date of issue. Any other reliance assumed by third parties on this report shall be at such parties' own risk. Any ensuing liability resulting from use of the report by third parties cannot be transferred to Aargus.

Whilst this report provides a review of site conditions encountered at sampling locations within the investigation, it should be noted that if materials are proposed to be moved from site - Part 5.6, Section 143 of the Protection of the Environment Operations (POEO) Act 1997 states that it is an offence for waste to be transported to a place that cannot lawfully be used as a facility to accept that waste. It is the duty of the owner and transporter of the waste to ensure that all material removed from a site must be accompanied by an appropriate waste classification report and materials are disposed of appropriately. An environmental or validation report does not constitute a waste classification report and results are treated

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 38 of 39

differently. Aargus accepts no liability for the unlawful disposal of waste materials from any site. Aargus does not accept any responsibility for the material tracking, loading, management, transport or disposal of waste from the site. If material is to be removed from a site, before disposal of any material to a licensed landfill is undertaken, the site owner must ensure an appropriate waste classification exists for all materials on the site planning to be removed, the waste producer will need to obtain prior consent from the licensed landfill/recycler. The receiving site should check to ensure that the material received matches the description provided in the report.

Opinions are judgements, which are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions.

Appendix K – Important information about your environmental site report should also be read in conjunction with this report.

8th March 2023

Preliminary Site Investigation, Ref: ES8708

Property: 368-370 Cowpasture Road, Middleton Grange, NSW

Page 39 of 39

REFERENCES

This report was prepared with reference to the following guiding documents:

- NSW Department of Planning and Environment (2022) – The State Environmental Planning Policy (Resilience and Hazards) 2021: “Chapter 4 – Remediation of Land”.
 - “Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018” (ANZECC);
- “Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
 - “Guidelines for Managing Risk to Recreational Waters 2008 (GMRRW); and
 - “National Environmental Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1)”, NEPC (2013).
- CRC Care Technical Report No. 13 – Soil Vapour Assessment (August 2009).
- Department of Urban Affairs and Planning – EPA (1998) “Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land”.
- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1).
- NSW DEC “Guidelines for the NSW Site Auditor Scheme” (2017, 3rd edition). NSW Environment Protection Authority, Sydney.
- NSW EPA (2014) – “Waste Classification Guidelines, Part 1: Classifying Waste”;
- NSW DECCW, “Vapour Intrusion: Technical Practice Note”, (September 2010);
- NSW EPA “Guidelines for Consultants Reporting on Contaminated Sites” (2020). NSW Environment Protection Authority, Sydney.
- NSW EPA “Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997” (2009). NSW Environment Protection Authority, Sydney;
- NSW EPA “Sampling Design Guidelines” (2022). NSW Environment Protection Authority, Sydney.

**Liverpool City Council
Local Planning Panel Report**

Item no	(leave blank)
Application Number	RZ-7/2021
Proposal	Planning Proposal to amend the zoning, HOB and FSR relating to land at 368-370 Cowpasture Road, Middleton Grange.
Site	Lot 4 DP 1052704 368-370 Cowpasture Road, Middleton Grange 2171
Applicant	APP Corporation
Owner	Cowpasture Road (2005) PTY LTD
Recommendation	Proceed to Gateway determination
Planning Officer	Brianna van Zyl – Strategic Planner

Executive Summary

In December 2021, APP Corporation lodged a planning proposal (**Attachment 1**) on behalf of the owners at 368-370 Cowpasture Road, Middleton Grange. Following additional information requests, the proposal was accepted in March 2022, and a revised planning proposal was submitted in September 2022.

The proposal has been submitted pursuant to Section 3.33 of the *Environmental Planning and Assessment Act 1979* (EP&A 1979), and the proposal is referred to the Local Planning Panel in accordance with Section 2.19 of the EP&A 1979 for advice. The subject site can be seen in Figure 1 below:



Figure 1: Subject Site Outlined in red. Source: Nearmap

**Liverpool City Council
Local Planning Panel Report**

The planning proposal seeks to amend the zoning, height of building (HOB) and maximum floor space ratio (FSR) controls applying to the site. The proposed amendment includes:

- Land Use Zone: from R1 General Residential to B6 Enterprise Corridor;
- Floor Space Ratio (FSR): from 0.65:1 to 0.75:1; and
- Height of Building (HOB): from 8.5m to 15m.

It is noted that during consultation with Council in December 2021, and prior to lodgement of the planning proposal in March 2022, the proponent initially sought a HOB of 15m and FSR of 1:1. This was not considered appropriate given the adjoining residential context, therefore the planning proposal proposes a revised FSR of 0.75:1. Council staff do not consider the proposed 15m height to be appropriate, and are recommending the proposal proceed with a 12m height of building development standard. This recommendation is discussed further within the report.

The site is currently identified under Schedule 1, Clause 9 of the Liverpool Local Environmental Plan 2008, which allows for the additional permitted uses of service stations, and take away food and drink premises. If the site is rezoned, it is recommended the Additional Permitted Use no longer applies to this site, and is removed from the Key Site Map.

The proposed B6 Enterprise Corridor would reflect the type of development on site (service station and takeaway premises). However, the stated intent of the planning proposal is to facilitate the development of a 3,375m² specialised retail premises. Whilst this is indicative, under this proposal intent the existing service station, convenience store and two fast-food premises will be demolished.

Given the existing service station on site, and to ensure alignment with Ministerial Direction 4.4 Remediation of Contaminated Land a Preliminary Site Investigation (PSI) study is required. Council officers have requested this on two previous occasions, however have not yet received a report. The submitted Stage 2 Detailed Site investigation, is outdated and references superseded documents. Therefore, this report cannot be relied upon for this assessment. It should be noted the proposal will not be reported to the elected Council until a PSI study is received.

The planning proposal has been referred to internal teams within Council, all of whom are supportive of the proposal. However, Council traffic team request that the proposal be referred to TfNSW during the Gateway Assessment consultation.

The assessment within the report finds that the planning proposal demonstrates strategic merit. However, without a PSI study it is hard to ascertain site specific merit. Pending the outcomes of this study, it is believed site specific merit can be achieved. A letter dated 7 November 2022 was sent to the applicant requesting minor errors and inconsistencies be corrected before the planning proposal is presented to Council.

Council officers recommend that the planning proposal proceeds to Gateway, subject to the submission and the findings of a PSI Study, and consideration by the elected Council.

Liverpool City Council Local Planning Panel Report

Background Information

The Site

The planning proposal relates to 368-370 Cowpasture Road, Middleton Grange (Lot 4 DP 1052704). This site has the total area of approximately 4,500m², and a 4m slope from the north western corner down to the south eastern corner. The site has a primary road frontage of approximately 80m to Cowpasture Road which is a classified road and also contains TransGrid infrastructure. The site has no direct access from adjoining residential streets.

The site is currently zoned R1 General Residential under the *Liverpool Local Environmental Plan 2008* (LLEP 2008) (**Figure 2**), with a specified Floor Space Ratio of 0.65:1, and Height of Building of 8.5m. It is identified under Clause 9, Schedule 1 Additional Permitted Uses of the LLEP 2008, which allows for the additional permitted uses of service stations and take away food and drink premises on the site, subject to size restrictions of 300m². The site presently comprises of two take-away food drink premises and a service station with associated convenience store.

The site is mapped as having moderate salinity potential. A large proportion is mapped as having Biodiversity Certified Land.

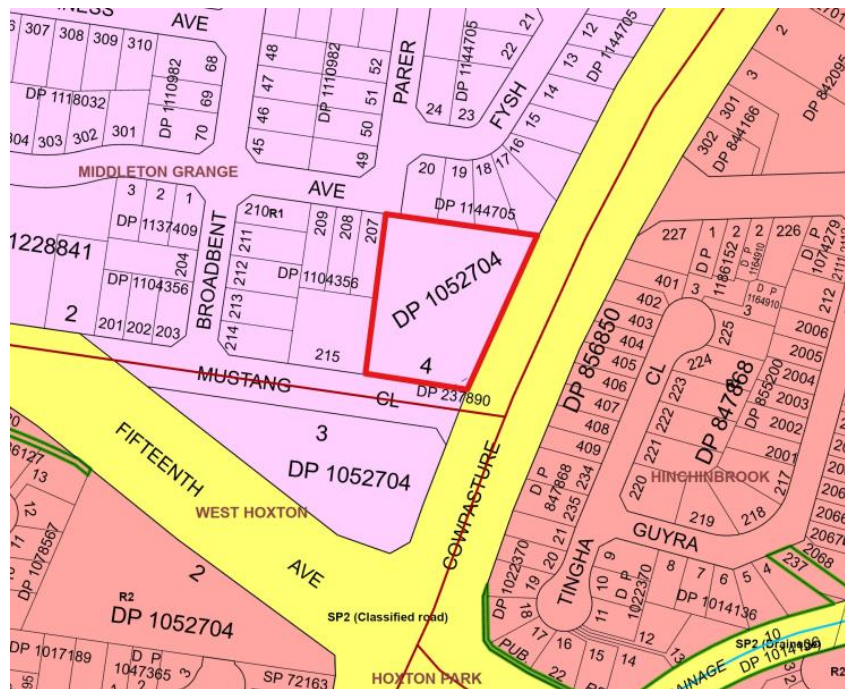


Figure 2: LEP2008 Zoning, subject site outlined in red. Source: Geocortex

The Locality

The site is located approximately 7.5km west of the Liverpool City Centre, and approximately 1.5km north of Carnes Hill Market Place. It also benefits from being located 200m from Fifteenth Avenue, a future transit corridor.

Liverpool City Council Local Planning Panel Report

The sites to the west of the subject site are zoned R1 General Residential, with the sites on the eastern side of Cowpasture Road zoned R2 Low Density Residential. Development within these residential zones are predominantly low scale detached dwellings, except for 20 Mustang Close, which is operating as a gym.

The context of the locality is shown below on figure 3 below.



Figure 3: Locality (Source: Nearmap)

Application Timeline

17 December 2021

The planning proposal was submitted via the NSW planning portal. After a preliminary review, Council listed a number of outstanding items to be addressed prior to lodgement. Some of the outstanding items included:

- The site plan and concept plan required more detail;
- Ministerial Direction 4.4 is required to be addressed and a Preliminary Site Report should be prepared and included within the planning proposal package;
- A traffic report should be included within the planning proposal package;
- An economic impact study should be included within the planning proposal package;
- and
- The relevant strategies including the centre and corridor strategy should be addressed.

17 January 2022

The Planning Proposal was re-submitted, and upon preliminary review, the following outstanding items were required to be addressed prior to Council accepting lodgement of the planning proposal:

Liverpool City Council Local Planning Panel Report

- A preliminary site investigation to be prepared in order for Ministerial Direction 4.4 to be addressed; and
- Council also flagged that the proposed development standards were significantly greater in scale than the development envisioned, and that flexibility of the site future is not alone a sufficient rationale for the increase in FSR and HOB sought. It was requested additional justification was required for the proposed development standards.

8 March 2022

The Planning Proposal was resubmitted, and officially lodged with Council. The proposal sought the following amendments to LLEP 2008:

- Rezoning to land from R1 General Residential to B6 Enterprise Corridor
- Amendment to HOB from 8.5m to 15m.
- Amendment to FSR from 0.65:1 to 0.75:1

Internal referrals were conducted and on 30 March 2022, Council staff requested that all the supporting documents including the Traffic Study, and Economic Impact Assessment were updated to reflect the amended planning proposal.

14 September 2022

The Planning Proposal and supporting documents were resubmitted. The majority of inconsistencies between documents were addressed, and subsequently an assessment was undertaken.

Development Applications

There are no recent Development Applications for the subject site, and previous applications are below:

- DA-1130/2013: Replacement and installation of signage associated with an existing service station;
- DA-682/2013: Alterations to an existing KFC restaurant; and
- DA-962/2008: re-image of existing KFC store including revised signage.

Details of the Planning Proposal

This Planning Proposal was resubmitted in March 2022, (and revised in September 2022) and seeks to amend the land use zone, height of building and floor space ratio development standards applying to the site. A summary of the proposed amendments and the existing planning controls are outlined below:

	Existing	Proposal	Council's Recommendations
Zone	R1 General Residential	B6 Enterprise Corridor	B6 Enterprise Corridor
FSR	0.65:1	0.75:1	0.75:1
Height	8.5m	15m	12m

Liverpool City Council Local Planning Panel Report

The rezoning of the site from R1 General Residential to B6 Enterprise Corridor will enable development of the site for uses which are currently prohibited under the R1 General Residential zone. Conceptual plans indicate the intended development of a specialised retail premises which is defined under the Standard Instrument LEP as:

*“**specialised retail premises** means a building or place the principal purpose of which is the sale, hire or display of goods that are of a size, weight or quantity, that requires—*

(a) a large area for handling, display or storage, or

(b) direct vehicular access to the site of the building or place by members of the public for the purpose of loading or unloading such goods into or from their vehicles after purchase or hire,

but does not include a building or place used for the sale of foodstuffs or clothing unless their sale is ancillary to the sale, hire or display of other goods referred to in this definition.

Note—

Examples of goods that may be sold at specialised retail premises include automotive parts and accessories, household appliances and fittings, furniture, homewares, office equipment, outdoor and recreation equipment, pet supplies and party supplies.

*Specialised retail premises are a type of **retail premises**—see the definition of that term in this Dictionary.”*

The original planning proposal (prior to lodgement), sought the floor space ratio of 1:1. However, Council staff advised these standards were significantly greater in scale than the development envisioned. It was then revised, requesting 0.75:1 FSR.

Under the current permissible FSR controls, the site could utilise a total of approximately 2,925m² of gross floor area. The proposed provisions of 0.75:1 would allow for approximately 3,375m² in gross floor area. An increase of roughly 450m².

The site will no longer use the provisions under Schedule 1 Clause 9 of the LLEP 2008 for additional permitted use of Service Station and Take-away food and drink premises as these will be permissible under the proposed land use zone.

It should also be noted, under the DPE Employment Land Reforms, the B5 Business Development and B6 Enterprise Corridor zones will merge into the new E3 Productivity Support zone. The draft objectives of the new zone are:

- *To provide a range of facilities and services, light industries, warehouses and offices.*
- *To provide for land uses that are compatible with, but do not compete with, land uses in surrounding local and commercial centres.*
- *To maintain the economic viability of local and commercial centres by limiting certain retail and commercial activity.*
- *To provide for land uses that meet the needs of the community, businesses and industries but that are not suited to locations in other employment zones.*
- *To provide opportunities for new and emerging light industries.*

Liverpool City Council Local Planning Panel Report

- *To enable other land uses that provide facilities and services to meet the day to day needs of workers, to sell goods of a large size, weight or quantity or to sell goods manufactured on-site.*

Some of the permissible uses currently proposed for the E3 Productivity Support zone include, but are not limited to, office premises, light industries, service stations, take away food and drink premises, specialised retail premises, vehicle repair stations and hotel and motel accommodation. The existing uses on site, as well as the proposed indicative conceptual plans meet the objectives on E3 Productivity Support zone.

The planning proposal is accompanied by supporting documents below:

- Attachment 1: Planning Proposal Report
- Attachment 2: Traffic Report
- Attachment 3: Economic Report
- Attachment 4: Concept Plan
- Attachment 5: Survey Plan
- Attachment 6: Existing Site Plan
- Attachment 7: Detailed Site Investigation (as noted in this report, Council has requested a current Preliminary Site Investigation (PSI) Study)

Conceptual Development Plan

The initial conceptual plans December 2021 (prior to lodgement) included a building footprint at the rear (western boundary) of the site in addition to the existing petrol station/takeaway onsite. However, the applicant advised Council, that after undergoing additional assessment it was discovered the parking arrangements of the DCP could not be met.

The current indicative concept plans provide for a 3,375m² two storey specialised retail premise in the north-west corner of the site, including 23 parking spaces. The proposed schemes include a 3m landscape setback. Under these conceptual plans, the existing service station and convenience store, and two take away food and drink premises will be demolished and replaced by a specialised retail premises. The revised plans are shown in figure 4 below.



Figure 4: Conceptual Plan (Source: MPA Architects)

Liverpool City Council Local Planning Panel Report

Consideration for Strategic Merit

The DPE Local Environmental Plan Making Guideline includes the following questions to assess the strategic merit of the proposal:

Section A – Need for the planning proposal

Is the planning proposal a result of an endorsed local strategic planning statement, strategic study or report?

The planning proposal is not the result of any endorsed strategic study or report.

Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The planning proposal is the best means of achieving the intended outcomes. The site is currently zoned R1 General Residential, which is not reflective of the current uses on site (as the service station and takeaway food and drink premises are currently permissible through an additional permitted use). The rezoning will ensure the site can also facilitate redevelopment of a specialised retail premises which is the intended future use of the site.

Section B – Relationship to the strategic planning framework

Will the planning proposal give effect to the objectives and actions of the applicable regional or district plan or strategy (including any exhibited draft plans or strategies)?

Greater Cities Regional Plan: A Metropolis of Three Cities:

The Greater Sydney Regional Plan – A metropolis of Three Cities was released in March 2018 and prepared by the Greater Cities Commission (formally Greater Sydney Commission). The plan encompasses a global metropolis of three cities – the Western Parkland City, The Central River City and the Eastern Harbor City. The Liverpool LGA is located within the Western Sydney Parkland City. Consistency with the relevant parts of the regional plan is assessed below in the following table

Table 1: Consistency with A Metropolis of Three Cities

Planning Priority	Comment
Objective 6: Services and Infrastructure meet communities changing needs	This priority aims to make sure infrastructure and services are protected and meet the communities needs. The rezoning will facilitate the redevelopment of a specialised retail premises which aligns with the objectives of both B6 Enterprise Corridor, and E3 Productivity Support.

Western City District Plan:

Section 3.8 of the EP&A Act requires that a planning proposal authority gives effect to any district strategic plan applying to the LGA to which the planning proposal relates to. The Western City District Plan provides a series of priorities and actions to guide development and expected growth throughout the district. The relevant priorities and actions are outlined in the table below:

**Liverpool City Council
 Local Planning Panel Report**

Table 2: Consistency with Western City District Plan

Planning Priority	Comment
Planning Priority W1: Planning for a city supported by infrastructure	<p>This priority aims to ensure existing infrastructure use is optimised. This rezoning will increase the capacity on site and protect the land in perpetuity for employment and business uses. Given the locality of the site with good access to road connections, it is deemed that the proposal will help to harness existing infrastructure present.</p> <p>Therefore, the proposal is consistent with this priority.</p>
Planning Priority W3: Providing services and social infrastructure to meet peoples changing needs	<p>The rezoning will ensure the site is zoned appropriately and increases the range of commercial and light industrial permissible. Whilst still indicative, the supplied conceptual plans indicate a development of a specialised retail premises servicing the local population.</p>
Planning Priority W11: Growing investment, business opportunities and jobs in strategic centres	<p>The proposal is generally consistent with this direction. The additional HOB and FSR provisions, and the rezoning will create more capacity for employment uses.</p> <p>The submission economic study does indicate a loss of jobs on site; however these are believed to be easily replicated through the LGA and minor in nature.</p> <p>The rezoning is considered important given the land would be expensive and complex to remediate for a residential use in alignment with the existing zone. Therefore, the proposal will ensure the current and future uses on site align with the objectives and permissible uses of the zone.</p>

Is the planning proposal consistent with a Council LSPS that has been endorsed by the Planning Secretary or GSC, or another endorsed local strategy or strategic plan?

Connected Liverpool 2040 – Local Strategic Planning Statement

Councils Local Strategic Planning Statement (LSPS) was endorsed in 2020. Assessment of consistency with the LSPS is provided below:

Table 3: Consistency with Local Strategic Planning Statement

Planning Priority	Comment
3. Accessible and connected suburbs	<p>Planning Priority 3 states that Council is committed to development along popular transport routes in the right location and ensuring these are maintained and improved. Rezoning the subject site to B6 Enterprise Corridor will ensure this site is protected and maintained for urban service / light industrial uses into the future. Therefore, it is seen as consistent with this priority.</p>
12. Industrial and employment lands	<p>Planning Priority 12 states that Council will review LEP controls to ensure flexible planning controls to ensure businesses are not</p>

**Liverpool City Council
Local Planning Panel Report**

meet Liverpool's futures needs	unduly restricted. This planning proposal will improve flexibility on site and ensure the zoning accurately reflects the existing and future intended use. It will also increase the amount of business land in the LGA. Therefore, the proposal is seen as consistent with this priority.
--------------------------------	--

Liverpool Centre and Corridor Strategy 2020:

The Liverpool Centre and Corridor Strategy has been developed in response to Action 11.3 of Councils LSPS. The strategy categorises Liverpool Centres and Corridors and provides direction for future planning. Specifically, the strategy outlines the guiding criteria for planning proposal which is assessed below:

Table 4: Liverpool Centre and Corridor Strategy guiding criteria

Guiding Criteria	Comment
1. Proposals must not have a significant impact on the retail operations of the Liverpool City Centre, town centres and local centres (including planned future centres)	The site is already operating as a Service Station and Take-away food and drink premises. The planning proposal requests a rezoning of the site to B6, in line with the existing and intended future land uses. The site's current operations will not impact any immediate centres, and the submitted economic study identifies that the proposed specialised retail premises would serve a different function to the existing local centres in the nearby area.
2. The creation of new out of centre retail developments are not encouraged	The planning proposal was accompanied by an economic report which stated the proposal will serve a different function in the retail / commercial hierarchy compared to the large centre planned at Middleton Grange Village and at Carnes Hill Town Centre. On this basis, there will be no adverse impact on the surrounding centres.
3. In all centres (except neighbourhood centres), proposals must retain the existing amount of retail and commercial floorspace as part of a mixed-use development	The planning proposal will increase the allowable floor space on site.
4. Proposals for redevelopment or expansion of town centres and local centres must demonstrate improved integration with the public domain and with nearby open space, social infrastructure and other services	The site is not connected to a town or local centre and does not propose an expansion of an existing centre. Rather, a rezoning is proposed to ensure the current and future land uses on the site meet the objectives on the applicable zone.
5. Allow additional retail uses in B5 zone if it can be demonstrated they could not reasonably locate in	N/A

**Liverpool City Council
 Local Planning Panel Report**

another centre and they constitute a small proportion of the total retail floorspace	
--	--

Liverpool Industrial and Employment Land Strategy 2020

Liverpool Industrial and Employment Lands Strategy 2020 aims to improve existing and attract new industrial development to meet the current and future demands of Liverpool. The strategy identifies a growing need for industry to specialise and target niche sectors to retain a competitive edge along with the existing demand for urban services, larger scale distribution and specialised innovation and creative industries. Specifically, the strategy identifies guiding criteria for planning proposals, which the subject planning proposal has been assessed against below.

Table 5: Liverpool Industrial and Employment Land Strategy Guiding Criteria

Guiding Criteria	Comment:
Any rezoning application is to result in a sustainable job increase	<p>The intent of this planning proposal is to ensure the land use zoning of the site reflect the existing and future land uses and facilitate redevelopment of a specialised retail premises. The supporting economic report stated that there are currently 60 full time and part time jobs generated on the site.</p> <p>If the site was developed as per the supplied conceptual plans, it would result in 106 direct and indirect jobs during the construction phase, and a total of 52 jobs on completion. This is a minor reduction of 8 jobs.</p> <p>Whilst technically inconsistent with this principle, the rezoning is necessary to protect the land into the future for employment uses, and ensure it is not inappropriately developed as residential.</p> <p>The existing and proposed land uses on site meet the objectives of both the current B6 and future E3 zone. Therefore, the proposal is considered justifiably inconsistent with this criterion.</p>
Rezoning proposals must be supported by an Economic Impact Study	The planning proposal is supported by an Economic Impact Study.
Proposal must be designed to avoid land use conflicts	The site is directly adjacent to residential dwellings. Acoustic screens are currently provided to mitigate impacts to these sensitive land uses. Given the site is already operating as a service station and two take away food and drink premises it is considered appropriate to rezone to B6 Enterprise Corridor. However, any future DA will have to carefully consider the sensitive interface with adjoining dwellings.
Proposals are to demonstrate that new	The conceptual development is expected to generate an additional 10 trips per hour. Whilst technically inconsistent with

**Liverpool City Council
Local Planning Panel Report**

Guiding Criteria	Comment:
development will facilitate sustainable transport choice	this principle, the subject site is already developed and operating. It is deemed that this minor inconsistency is negligible given the scale of the proposal .
Proposal must contribute to and improve the public domain	This will be assessed as part of a future DA.
Proposal for the adaptive reuse of older industrial stock must consider and respect existing character	N/A

Is the planning proposal consistent with any other applicable State and regional studies or strategies:

The planning proposal has been assessed against relevant state and regional studies, a shown in Table 6 below.

Table 6: Consistency with state and regional strategies:

Policy	Comment
Cumberland Plain Conservation Plan (CPCP)	<p>The CPCP is a conservation plan for Western Sydney that identifies strategically important biodiversity areas within the Cumberland subregion to offset the biodiversity impacts of future urban development.</p> <p>The subject site is located within the CPCP boundary. However, the site is not identified as having high conservation value. As such, this policy is not applicable</p>
Future Transport Strategy 2056	<p>The future transport strategy sets out direction for continuing to improve the transport system. It lists 14 strategic direction and links to the Greater Cities Commission region plans.</p> <p>Given the proposal is of a small scale and won't increase trip generation substantially, it is considered sufficiently consistent with this strategy. =</p>

Is the planning proposal consistent with the applicable SEPPs?

The planning proposal is not inconsistent with SEPPS applying to the land. Further justification can be viewed under Table 7:

Table 7: Consistency with SEPPS

Policy	Comment
Housing SEPP	Not applicable.
Transport and Infrastructure SEPP	Not applicable.

**Liverpool City Council
Local Planning Panel Report**

Primary Production SEPP	Not applicable.
Biodiversity and Conservation SEPP	This SEPP includes planning controls that require the CPCP to be considered. The site is located within the CPCP area, however, it is not identified under the conservation mapping. Therefore, consistency with the SEPP is not applicable.
Resilience and Hazard SEPP	<p>Chapter 4 of the Resilience and Hazard 2021 SEPP provides a state-wide planning approach to the remediation of contaminated land.</p> <p>Pursuant to Table 1 of the Managing Land Contamination: Planning Guidelines, Service Stations are identified as an activity that may cause contamination. Given, there is an operating service station on site this SEPP is applicable and must be considered.</p> <p>A PSI Study must be provided prior to Gateway Assessment. The proposal will not be reported to the elected Council until the PSI is received and can demonstrate consistency with the SEPP and relevant Ministerial Direction in relation to contamination.</p>
Industry and Employment SEPP	Not applicable.
Resources and Energy SEPP	Not applicable.
Planning System SEPP	<p>This SEPP includes requirements for State Significant Development.</p> <p>This SEPP may be applicable at a Development Assessment Stage.</p>

Is the planning proposal consistent with applicable Ministerial Directions (Section 9.1).

In Table 8, below the relevant 9.1 Direction has been assessed, and the proposal is deemed consistent.

Table 8: Assessment of 9.1 Directions

Section	Comment	Consistency
1. Planning Systems		
1.1 Implementation of regional plans	The objective of this direction is to give legal effect to the vision, land use strategy, goals, directions and actions contained in Regional Plans. This has been assessed in Table 2 of this report and the proposal has demonstrated consistency with this plan.	Consistent.
1.4 Site Specific Provisions	The objective of this direction is to discourage unnecessarily restrictive site-specific planning controls. This planning proposal will result in a spot-rezoning, however the rezoning will allow for a wider range of land-use, and greater gross floor area. Furthermore, the rezoning will enable an existing additional permitted use	Consistent.

**Liverpool City Council
Local Planning Panel Report**

	to be removed on the site. Therefore, the proposal is consistent with this direction.	
4. Resilience and Hazards		
4.4 Remediation of Contaminated Land	<p>The objective of this direction is to reduce the risk of harm to human health and the environment by ensuring that contamination and remediation are considered by planning proposal authorities.</p> <p>The planning proposal is accompanied by a Stage 2 Detailed Site Investigation from 2005. When considering the age of the Stage 2 Detailed Site Investigation, the report is unlikely to be representative of the site's current conditions. As such, Council has requested a PSI be prepared prior to the proposal being referred to Council. The submitted PSI will need to demonstrate consistency with this direction in order for the proposal to progress.</p>	N/A
5. Transport and Infrastructure		
5.1 Integrating Land Use and Transport	<p>The objective of this direction is <i>"to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives:</i></p> <ul style="list-style-type: none"> • <i>improving access to housing, jobs and services by walking, cycling and public transport, and</i> • <i>increasing the choice of available transport and reducing dependence on cars, and</i> • <i>reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and</i> • <i>supporting the efficient and viable operation of public transport services, and</i> • <i>providing for the efficient movement of freight."</i> <p>The planning proposal is deemed consistent given the site is already operating as a service station and take-away food and drink premises. This rezoning will ensure the zoning reflects the current uses on site, and will allow redevelopment of other similar uses into the future.</p> <p>The conceptual plans supplied with the planning package indicate redevelopment of the site as a specialised retail premise. The traffic implications of the indicative plans are minor in nature and considered appropriate.</p>	Consistent.
6. Housing		

**Liverpool City Council
Local Planning Panel Report**

6.1 Residential Zones	<p>The site is currently zone R1 General Residential and is proposed to be rezoned to B6 Enterprise Corridor. Residential is currently permitted in both zones, and thus this direction is applicable.</p> <p>This planning proposal does not reduce development standards, rather increases development standards on the site. Whilst the site is currently zone for residential uses, the land uses on site are not of a residential nature. Residential would not be considered appropriate for this site given contamination concerns. The proposed rezoning will help protect the land as urban service / light industrial land in alignment with the current and intended future use of the site.</p>	Consistent.
7. Industry and Employment		
7.1 Business and Industrial Zones	<p>This planning proposal is seeking to rezone the site from R1 General Residential to B6 Enterprise Corridor, therefore this direction is applicable.</p> <p>The rezoning will ensure the site is maintained as urban service land and increase the potential floor space permissible on the site.</p>	Consistent.

Consideration for Site Specific Merit

Section C – Environmental, social and economic impact

Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

The site is already occupied by a service station and two take-away food and drink premises. No critical habitat or threatened species are present, nor will be affected.

Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

Contamination

Pursuant to Table 1 of the managing land contamination: planning guidelines SEPP 55 – Remediation of Land, service stations are identified as an activity that may cause contamination.

According to the *Liverpool Local Environment Plan 2008*, sensitive uses such as serviced apartments, shop top housing and education establishments are currently permitted with consent in the B6 Enterprise Corridor. The contaminated land planning guidelines indicate that it would not be appropriate to proceed with the rezoning unless the land was proven suitable for the development or it could be demonstrated that the land can, and will be, remediated to make the land suitable.

**Liverpool City Council
Local Planning Panel Report**

In order to address the Ministerial Direction and the contamination guidelines, the planning authority is required to consider contamination, and have regard to a report specifying the findings of a preliminary investigation.

Council staff have previously requested a PSI be prepared and submitted with the planning proposal. It is noted that this requirement is not strictly stipulated to occur prior to a Gateway determination. Nonetheless, Council requires this assessment to ensure consistency with Ministerial Direction 4.4 can be achieved. Without this report, Site Specific Merit can not be demonstrated.

Council has notified the proponent that this planning proposal will not be referred to Council for endorsement unless a PSI is received and can demonstrate the site is suitable for the proposed rezoning. In addition, the guidelines made and approved by the NSW EPA under the contaminated *Land Management Act 1997* have changed since the preparation of the Stage 2 Detailed Site Investigation. Consequently, the submitted report is outdated and irrelevant to the assessment of this planning proposal.

Council staff support the Local Planning Panel including advice that a PSI be supplied prior to referral to the elected Council.

Traffic and Parking

The planning proposal is accompanied by a Traffic Report that analysed the traffic implications of the additional floor space and building heights. The traffic report considered both the proposed and future development on site, stating the existing uses on site generated 85 vehicles per hour during the weekday morning peak hour, and 175 vehicles per hour during the weekend afternoon peak.

In addition, the traffic report stated that, the conceptual plans provide a 3375m² specialised retail premises with the provisions of 23 parking spaces. As per Transport for NSW guidelines, the conceptual development would generate some 35 to 85 vehicles per hour. It concludes the proposed development facilitated by this planning proposal would generate less traffic than the existing uses on site.

Council's assessment of the traffic report indicated in the last 10 years, three car crashes occurred in front of the subject site due to the existing site access arrangements Council staff also identified discrepancies between the applicants traffic report and their assessment. As per Council's assessment, the proposal is expected to use the existing access and generate an additional 10 vehicles trips per hour. This traffic increase is minor and not expected to have a noticeable impact on the operation of the adjacent road work. In addition, the proposed development will the need 36 parking spaces as per the Liverpool DCP.

Council's transport management team, raised no objection to the planning proposal subject to:

- A safety gap analysis being carried out for the existing entry and exit access arrangements at Development Assessment Stage; and
- The planning proposal being referred to TfNSW, and indicating support for the existing access arrangements.

Liverpool City Council Local Planning Panel Report

Development Controls

The planning proposal seeks an increase in allowable HOB and FSR for the site. Whilst there is strategic merit in rezoning the site to B6 Enterprise Corridor, the proposed height of building standard of 15m will result in unreasonable amenity and overlooking impacts on the adjoining residential lots.

In addition, on 2 February 2022, Council endorsed the “*Mayor’s 100 Day Revitalisation Action Plan*” which included:

- Prepare a planning proposal to lower the height of building development standards in the Liverpool Local Environmental Plan 2008 down to 12m in the following suburbs:
 - Chipping Norton
 - Wattle Grove
 - Hammondville
 - Casula
 - Prestons
 - Carnes Hill
 - Cecil Hill
 - Green Valley.

Following this, on 27 July 2022, Council endorsed the following principles for the Local Environmental Plan Review:

- “ 2. *Adopt the following principles for managing commercial land under the new LEP:*
- a. *Provide for the retail needs of the Liverpool LGA into the future*
 - b. *Enable redevelopment of centres which will provide both commercial and residential uses, with high quality design encouraged*
 - c. *All centres, regardless of their hierarchy, are to have a height of building development standard of 12m or less to limit the height of buildings across all centres within the LEP, with exclusions as noted within this report, such as the Liverpool City Centre centres subject to planning proposals.*

The 15m height proposal does not align with the above principles endorsed by Council for a new LEP. Given the low-density residential context directly adjacent, and the endorsed principles of the LEP review, a 12m height is more suitable. This will allow for additional design flexibility, whilst still managing the sensitive interface.

Visual Impact / Zone Transition:

There is a 4m slope across the site from the residential properties on the adjoining western boundary, and the proposed 15m HOB control would have a moderate / high impact on the low scale residential properties adjoining the site.

As stated above, Council is willing to support a 12m HOB standard on site but believes 15m would result in an unreasonable impact on adjoining neighbours.

At the design stage, the proposal should include measures to reduce the bulk and visual impacts including landscape setbacks, planting of mature trees and façade and articulation design elements. The current DCP will help to guide this outcome at the DA stage.

**Liverpool City Council
Local Planning Panel Report**

Has the planning proposal adequately addressed any social and economic effects?

Economic effects

The site is currently operating successfully as a service station and associated convenience store, as well as two take away food and drink premises. Rezoning the site to B6 Enterprise Corridor will seek to protect the land as employment land, avoiding redevelopment of residential uses on site.

The planning proposal was accompanied by an Economic Study which concluded that the proposal would result in a minor net loss of jobs. Given the minor nature of this job loss, it is considered inconsequential when considering the merit of the proposal.

The conceptual plans indicate that the site could be redeveloped as a specialised retail premises and given the site connectivity, this will be well suited for trading.

Social effects

The proposal is not anticipated to have any negative social effects. The site is already operating for non-residential purposes, and the rezoning will ensure the site is appropriately zoned and provide more flexibility for light industrial and commercial uses. The proposed conceptual development is not anticipated to have any negative social impacts. Therefore, the social effects are adequately addressed. The planning proposal will be subject to community consultation, and any future DA assessed in further detail.

Section D – State and Commonwealth Interests

Is there adequate public infrastructure for the planning proposal?

Given the site is already operating as a service station and two take-away food and drink premises, the rezoning to a business zone will not increase demand for public infrastructure. As part of the Gateway Assessment, referral to TfNSW, Sydney Water and Endeavour Energy is recommended to ensure there is capacity for servicing.

What are the views of state and commonwealth public authorities consulted in accordance with the Gateway determination?

Views of the State and Commonwealth public authorities will be considered should a Gateway determination be issued. Relevant public authorities will be determined by DPE as part of a future Gateway Determination.

Next Steps

Following the Panel's consideration, the planning proposal will be reported to Council for consideration. It is noted that this is subject to the receipt of a PSI justifying the proposal on contamination grounds. Should the planning proposal request be endorsed by Council, it will be forwarded to DPE seeking a Gateway Determination.

Following a Gateway determination in support of the planning proposal, there will be public authority and community consultation and a further report to Council, prior to proceeding with the making of any amendment to the LLEP 2008. It is noted that the provision of various additional studies and clarification may be required by DPE prior to exhibition occurring.

**Liverpool City Council
Local Planning Panel Report**

It should be noted, Council has noticed several discrepancies throughout the planning proposal, including inconsistencies of the desired outcome and use of outdated definitions. Council staff will require these to be updated prior to referral to the elected Councillors.

Conclusion

Pursuant to the requirements of a Guide to Preparing Planning Proposals and relevant Ministerial directions, this report provides a merit assessment of the planning proposal request.

Subject to the submission of a PSI that demonstrates the land is suitable for further development, and update the planning proposal for other minor errors and inconsistencies, this report finds the followings amendments can be supported to proceed to with the planning proposal process:

- Rezone to the site from R1 General Residential to B6 Enterprise Corridor;
- Increase the FSR from 0.65:1:1 to 0.75:1; and,
- Increase the HOB from 8.5m to 12m.

The planning proposal request is presented to the panel for consideration.

Attachment 1: Applicant Prepared Planning Proposal

Attachment 2: Traffic Report (September 2022)

Attachment 3: Economic Report

Attachment 4: Conceptual Plans

Attachment 5: Survey Plan

Attachment 6: Existing Site Plan

Attachment 7: Detailed Site Investigation



MINUTES AND DETERMINATION OF THE LIVERPOOL LOCAL PLANNING PANEL MEETING

14th November 2022

Held online via
MS Teams

Panel: Michael Mantei (Chair)
Jason Perica
Marjorie Ferguson
Aaron Colley

There were no conflicts of interest declared by any panel members in relation to any items on the agenda.

LIVERPOOL CITY COUNCIL

LIVERPOOL LOCAL PLANNING PANEL MINUTES AND DETERMINATION PAGE 1

14th November 2022

ITEM No:	1
APPLICATION NUMBER:	RZ-7/2021
SUBJECT:	PLANNING PROPOSAL TO AMEND THE ZONING, HOB AND FSR RELATING TO LAND AT 368-370 COWPASTURE ROAD, MIDDLETON GRANGE
LOCATION:	368-370 COWPASTURE ROAD, MIDDLETON GRANGE NSW 2171
OWNER:	COWPASTURE ROAD (2005) PTY LTD
APPLICANT:	APP CORPORATION
AUTHOR:	BRIANNA VAN ZYL

ISSUES RELATED TO THE PLANNING PROPOSAL

The panel has considered the Council officers' report and attachments, including the applicant-initiated planning proposal. The Panel received a briefing from Council officers. The owner and his consultants attended the meeting and answered questions from panel members.

The panel considers the planning proposal has strategic merit given the location of the site on a major traffic thoroughfare adjacent to other non-residential uses to the south and south-west, while changes associated with Western Sydney International Nancy-Bird Walton Airport and Bradfield will change the nature of the wider area and connections over time. The site is currently used for non-residential purposes rendering the current R1 general residential zone somewhat anomalous. The proposed B6 Enterprise Zone formalises the current uses, while providing opportunities for other non-residential uses, generally consistent with the wider zoning regime and hierarchy.

The panel supports the Council officers' recommendation to reduce the maximum height of buildings on the site from 15m proposed to 12 metres. The reduced height is consistent with the elected Council's recent policy decision to lower height limits in commercial zones outside the Liverpool CBD and is particularly appropriate on this site being adjacent to residential uses to the north and north-west. The reduced maximum height limit will cater for the expected gross floor area of a future building on the site to a maximum FSR of 0.75:1.

The panel has carefully considered the site-specific merits of the proposal. The panel is particularly interested in the potential contamination of the site and the interface of future development with residential uses to north west and north. The panel notes that Local Planning Direction 4.4 – Remediation of Contaminated Land imposes a mandatory obligation of Council to *"obtain and have regard to a report specifying the findings of a preliminary investigation of the land carried out in accordance with the contaminated land planning guidelines"*. Council must also be satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for all the purposes for which land in the zone concerned is permitted to be used.

The panel supports Council's request to the applicant to provide Council with a preliminary site investigation in accordance with Direction 4.4. It is a matter for Council to determine what

LIVERPOOL CITY COUNCIL**LIVERPOOL LOCAL PLANNING PANEL MINUTES AND DETERMINATION
PAGE 2****14th November 2022**

further information, in addition to a preliminary site investigation, that Council requires to be satisfied that the land is suitable either in its contaminated state or after remediation for the proposed B6 zone.

The panel is aware that Council's development control plan requires a future commercial building on the site to be setback at least 5 metres from the residential zone boundary to the north and north east, including a minimum landscaped setback of 3 metres. While the site layout and design of future development on the site is a matter to be dealt with at the development application stage, the panel is satisfied that these development controls will assist in mitigating impacts of further development on those residential uses. The panel assumes the immediately adjoining residential land owners will be afforded the opportunity to comment on the planning proposal after gateway determination. The panel noted there is a draft concept plan for the site prepared by the applicant. The panel is of the view this should concept plan should not be endorsed and is otherwise provided for illustrative purposes only.

The panel also notes the potential risk for retail creep into this enterprise zone. If the LEP is amended to zone this site as B6 enterprise zone, Council officers should be careful to ensure in the assessment and determination of future commercial uses on the site that only those uses that squarely meet the definition of specialised retail premises are approved on the site. Similarly, care is needed to ensure an appropriate landscape and tree-canopy outcome for the site, in due course.

VOTING NUMBERS:

4 – 0

ADVICE OF PANEL:

That the planning proposal to amend the zoning, HOB and FSR standards relating to land at 368-370 Cowpasture Road, Middleton Grange:

- a. has strategic and site specific merit; and
- b. proceed to a gateway determination subject to the applicant providing Council with a preliminary site investigation report as required by Local Planning Direction 4.4 before submission to gateway.



INTEGRATED PEST MANAGEMENT POLICY

Adopted: *(Current date)*

TRIM *(Number)*



INTEGRATED PEST MANAGEMENT POLICY

DIRECTORATE: Operations

BUSINESS UNIT: City Environment

1. PURPOSE/ OBJECTIVES

The purpose of this Policy is to provide a framework for the effective management of priority pest species within the Liverpool Local Government Area (LGA) in a manner that minimises potential harm to human health and the environment. The Policy will be supported by an Integrated Pest Management (IPM) Strategy and Pest Management Plans for specific priority pests.

The objective of this Policy is to set an IPM framework that aims to:

- Manage pests in a manner that is consistent with legislative requirements and regional plans;
- Adopt a strategic approach to pest management to prevent pest populations becoming established;
- Adopt pest control techniques that minimise potential harm to human health and the environment; and
- Ensure that pest control measures are efficient, effective and appropriately target species that are of the greatest risk to the community, environment and economy.

2. DEFINITIONS

DPI - Department of Primary Industries. DPI is responsible for the legislative and policy framework for biosecurity matters within NSW and works with stakeholders to manage and mitigate pests.

IPM - Integrated Pest Management. The Food and Agriculture Organization of the United Nations defines IPM as *"the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimise risks to human health and the environment"*.

LLS - Local Land Services. LLS is responsible for delivering regional weed management plans and assists with education and community engagement initiatives.

Pest (as defined under section 15 of the *Biosecurity Act 2015*) - A plant or animal (other than a human) that has an adverse effect on, or is suspected of having an adverse effect on, the environment, the economy or the community because it has the potential to:

- out-compete other organisms for resources, including food, water, nutrients, habitat and sunlight;
- prey or feed on other organisms;

- transmit disease to other organisms;
- cause harm to other organisms through its toxicity;
- otherwise reduce the productivity of agricultural systems or the value of agricultural products;
- damage infrastructure;
- reduce the amenity or aesthetic value of premises;
- harm or reduce biodiversity; or
- do any other thing, or have any other effect, prescribed by the regulations.

3. POLICY STATEMENT

3.1. Background

This Policy provides the broad framework and principles for IPM within Liverpool LGA. It will be supported by an IPM Strategy (to be developed), which will expand upon this Policy and provide details on priority species and actions. Where required, Pest Management Plans will then be developed to target specific priority pests that warrant detailed planning and action delivery.

3.2. Standard Pest Management Practices

Control measures that prevent or minimise the impacts caused by pests are generally the most effective. Measures that aim for pest eradication are undertaken when feasible, such as for highly localised incursions.

If not implemented in a strategic manner, pest control can be resource intensive, harmful, and of limited success. Without the appropriate planning, monitoring and coordination, pest management measures can result in negligible impact on the pest and can cause harm to off-target entities and the environment.

Control measures that rely heavily on chemical pesticides (including herbicides) can pose a risk to humans, beneficial species and the environment if incorrectly used. Pesticide use can also contribute to the development of pesticide resistance in some target species, limiting the long-term effectiveness of this treatment.

3.3. Integrated Pest Management

IPM recognises the importance of minimising control measures that may be environmentally harmful, and prioritising alternative measures to prevent and control pests. These measures include, but are not limited to:

- biological control such as predators, parasites or pathogens;
- physical measures such as barriers, traps or removal;
- environmental measures to make conditions less favourable for the pest;
- regulatory measures to prevent entry or spread of pests; and
- chemical measures that are less toxic.

Stakeholder education and engagement are also important aspects that can help prevent pest outbreaks and facilitate early intervention measures.

The benefits of IPM include reduced:

- health risks;
- chemical contamination risks;
- public concern about potential harm to humans or the environment; and
- pesticide resistance risks.

IPM can also have the additional benefit of offering the best value for money for control programs.

The enhanced pest management approach outlined within this Policy systematically prioritises target pest species via an IPM Strategy. The Strategy will also identify measures that aim to prevent outbreaks of pests and to minimise potential harm associated with control techniques.

Pest Management Plans, which prescribe detailed actions for a single species or for a group of similar species, will be developed when warranted. The development of Pest Management Plans will be progressive, with species that pose the greatest risk to the environment, community or economy being prioritised.

3.4. Applicability

This Policy primarily applies to the management of priority pests on land under the care, control or management of Council.

Community engagement and participation will also be encouraged to maximise the likelihood of success at a landscape scale. Inspections will also be undertaken on private land for high-risk pests in accordance with Council's responsibilities under the *Biosecurity Act*. Council also fulfils a health-related regulatory role on private land, which at times can involve pest species.

For pests that are not considered a priority for control measures, Council will work collaboratively with the community and key agencies to assist where practicable.

3.5. Responsibilities and Stakeholders

Pest control is a shared responsibility for government, industry and the community. Council will work collaboratively with NSW DPI, LLS, NSW Health, Regional Weed Committees and the community.

Pest management responsibilities are distributed across multiple departments of Council, as listed below:

- City Presentation has an operational responsibility for pest management within land under the care, control or management of Council, focusing on species that pose a risk to the environment and the community. City Presentation is also

responsible for implementing and enforcing compliance with the *Biosecurity Act 2015*;

- Economy and Growth (Community Standards) has a regulatory function investigating pest related complaints on private property that pose a risk to human health during routine inspections of regulated premises;
- City Environment provides strategic support for the planning phase of pest management and will lead the development of the IPM Strategy;
- Subsequent Pest Management Plans that respond to a specific pest or local outbreak will be developed by the section of Council tasked with the pest control action, which will depend on the primary risks of the target pest (such as biosecurity, health or environment); and
- Communications assists with the distribution of information on pests and control measures to the community.

4. RELEVANT LEGISLATIVE REQUIREMENTS

Agricultural and Veterinary Chemicals (Administration) Act 1992 (Commonwealth)
Agricultural and Veterinary Chemicals Code Act 1994 (Commonwealth)
Biodiversity Conservation Act 2016 (NSW)
Biosecurity Act 2015 (NSW)
Companion Animal Act 1998 (NSW)
Crown Land Management Act 2016 (NSW)
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
Fisheries Management Act 1994 (NSW)
Game and Feral Animal Control Act 2002 (NSW)
Local Government Act 1993 (NSW)
Local Land Services Act 2013 (NSW)
Pesticides Act 1999 (NSW)
Prevention of Cruelty to Animals Act 1979 (NSW)
Protection of the Environment Operations Act 1997 (NSW)
Work Health and Safety Act 2011 (NSW)

RELATED POLICIES & PROCEDURE REFERENCES

Greater Sydney Regional Strategic Pest Animal Management Plan 2018-2023
 Greater Sydney Regional Strategic Weed Management Plan 2017-2022
 Liverpool City Council Animal Management Policy
 Liverpool City Council Environment Restoration Plan
 Liverpool City Council Overgrown Vegetation Enforcement Policy
 Liverpool City Council Pesticide Use Notification Plan for Outdoor Public Places
 Liverpool City Council Work Health and Safety Policy
 Model codes of practice and standard operating procedures for the humane capture, handling or destruction of feral animals in Australia
 National Threat Abatement Plans (various species)
 NSW Biosecurity Strategy 2013 -2021
 NSW Invasive Species Plan 2018-2021
 Standard for Weed Management Capacity in NSW.
 Weeds and the Biosecurity Act: A handbook for local councils and councillors in NSW

AUTHORISED BY

Council Resolution

EFFECTIVE FROM

This date is the date the policy is adopted by Council resolution.

REVIEW DATE

The policy will be reviewed every two years.

VERSIONS

Version	Amended by	Changes made	Date	TRIM Number
1			xxx	xxx

THIS POLICY HAS BEEN DEVELOPED IN CONSULTATION WITH

City Presentation
 City Economy and Growth (Community Standards)
 City Corporate (Governance)
 Environment Advisory Committee
 Companion Animals Advisory Committee

The policy was placed on public exhibition in June 2022 in accordance with the *Local Government Act 1993*.

ATTACHMENTS

Integrated Pest Management Strategy

Integrated Pest Management Strategy

Final

March 2023

**LIVERPOOL
CITY
COUNCIL**





Liverpool City Council
Integrated Pest Management Strategy
 Final

Client: Liverpool City Council

Prepared by:

Molino Stewart Pty Ltd

Suite 3, Level 1, 20 Wentworth Street, Parramatta NSW 2150, Australia

PO Box 614, Parramatta CBD BC, Parramatta NSW 2124

T +61 2 9354 0300 www.molinostewart.com.au

ABN 95 571 253 092

ACN 067 774 332

March 2023

© Molino Stewart Pty Ltd. All rights reserved

Molino Stewart has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of Molino Stewart. Molino Stewart undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and Molino Stewart's experience, having regard to assumptions that Molino Stewart can reasonably be expected to make in accordance with sound professional principles. Molino Stewart may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.



Document Control

Document Reference	1314 Liverpool City Council Draft Integrated Pest Management Strategy V4.Docx
Project	Liverpool City Council
Document Type	Integrated Pest Management Strategy
Author	Rebecca O'Rourke

Revision History

Date	Version	Name	Comments
20/12/2021	1.0	Rebecca O'Rourke	Draft for internal review
21/12/2021	1.1	Shireen Baguley	First draft for client review
08/03/2022	2	Shireen Baguley	Second draft for client review
10/05/2022	3	Shireen Baguley	Third draft for public exhibition
19/08/2022	4	Shireen Baguley	Final Draft with consultation feedback incorporated
07/12/2022	Final Draft	Cam Radford	Final with consultation feedback incorporated
06/03/2023	Final	Neil Dufty	Final with final amendments

Document Approval

For Molino Stewart	
Name	Shireen Baguley
Position	Principal
For Liverpool City Council	
Name	Karen Visman
Position	Coordinator Environment Management

Executive Summary

Pests in Australia cause major economic, environmental, and social impacts at local, regional, and national scales. They inhabit a broad variety of habitats such as agricultural regions, forested lands, arid environments and urban areas and can have a significant impact on biodiversity by out-competing native plants and animals for resources, spreading disease, preying on native fauna and contributing to erosion and waterway degradation.

Integrated Pest Management (IPM) is an approach that establishes a sustainable methodology to managing pests by combining biological, cultural, physical and chemical tools in a way that minimises economic, health and environmental risks. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment.

Liverpool City Council (Council) has undertaken various levels of pest management to satisfy its legislative and community responsibilities. Council recently prepared an IPM Policy to provide a framework for the effective management of priority pest species within the Liverpool Local Government Area (LGA) in a manner that minimises potential harm to human health and the environment.

This IPM Strategy has been developed to support Council's IPM Policy and identify an improved approach to controlling pest animals and weeds. The focus of the Strategy is on the control of pests on land under the care, control and management of Council. However, the Strategy also includes biosecurity responsibilities, health related regulatory functions, and community engagement and education.

This Strategy addresses the legislative responsibility of Council and the roles and responsibilities of associated stakeholders with respect to managing priority pest species. Community engagement and public awareness are critical in effective pest management. This report discusses appropriate strategies including volunteer programs and community events; the use of informative signage in problem areas; the release of materials in multiple languages and the importance of altering public behaviour.

Through implementation of this Strategy Council aims to:

- Manage pests in a manner that is consistent with legislative requirements and regional plans;
- Adopt a strategic approach to pest management to prevent pest populations becoming established;
- Adopt pest control techniques that minimise potential harm to human health and the environment;
- Guide shared roles and responsibility of various stakeholders;
- Ensure that pest control measures are efficient, effective, and appropriately target species that are of the greatest risk to the community, environment and economy;
- Improve biodiversity assets on Council land through control of pest species;
- Minimise the impacts of pest species on Council assets;
- Minimise the impacts of pest species on residential assets;
- Improve community understanding of pest species management including actions regarding community education/awareness; and
- Manage community expectations of pest species management (education and information management).

**LIVERPOOL
CITY
COUNCIL**

Contents



1 Introduction	1
1.1 Purpose	2
1.2 Aim	2
1.3 IPM Principles	2
2 Legislative Responsibilities	3
3 Roles and Responsibilities	4
4 Pest Management in Liverpool City Council	5
4.1 Impacts	5
4.1.1 Economic	5
4.1.2 Environmental	6
4.1.3 Social	6
4.2 Challenges	6
4.3 Risks	6
5 Management Priorities	8
5.1 Nuisance vs. Priority Pests	8
5.2 Priority Pests	10
5.3 Nuisance Pests and Weeds of Concern	11
5.4 Native Species	11
6 Current Integrated Pest Management Practices	13
6.1 Bush Regeneration at Priority Sites and Broad-scale Weed Management Practices	13
6.2 Asset Protection and Aquatic Weed Treatment	14
6.3 Roadside Maintenance	14
6.4 Reactive Actions for New Incursions and High-risk Species	14
6.5 Involvement in Collaborative Projects	15
7 Improvement to Integrated Pest Management Practices	16
7.1 Pest Species Management Improvement	16
7.2 Non Species-Specific Improvement	16
8 Proposed Actions	17
8.1 Species Specific Measures for Priority Pests	17
8.2 Integrated Pest Management Approach	21
8.2.1 Internal Governance	21
8.2.2 Adaptive Implementation	24
8.2.3 Resource Prioritisation	26
8.2.4 Control Measures	28
8.2.5 Educational programs & community engagement	30
8.2.6 Partnerships and collaboration	32





8.2.7 Planning and Development	34
8.2.8 Pest Species Monitoring and Tracking	36
9 Community Education and Engagement	38
9.1 Commonly Reported Species	38
9.2 Education and Engagement Opportunities	38
10 Resourcing and Funding	41
10.1 Environment Restoration Plan	41
10.2 Weeds Action Program (WAP)	41
10.3 NSW Department of Primary Industries (NSW DPI) National Agreements	41
10.4 Federal Government Grants	42
10.5 Other	42
11 Integrated Pest Management Monitoring and Recording Program	43
11.1 Program Logic	43
11.2 Monitoring	44
11.3 Evaluation	45
11.4 Reporting	45
11.5 Improvement	45
12 Strategy Review Schedule	46

Appendices

Appendix A	Integrated Pest Management Principles
Appendix B	Legislation
Appendix C	Roles and Responsibilities
Appendix D	Matrix of Rational for Pest Species Inclusion
Appendix E	Discussion of Priority Pests

List of Tables

Table 1 Species Specific Actions for Priority Pests	18
Table 2: Internal governance pest management improvement, deliverables and performance indicators	22
Table 3: Adaptive management pest management improvement, deliverables and performance indicators	25
Table 4: Resource prioritisation pest management improvement, deliverables and performance indicators	27



Table 5: Control measures for pest management improvement, deliverables and performance indicators	29
Table 6: Community engagement and education programs for pest management improvement, deliverables and performance indicators	31
Table 7: Partnerships and collaboration for pest management improvement, deliverables and performance indicators	33
Table 8: Planning and development for pest management improvement, deliverables and performance indicators	35
Table 9: Pest species monitoring and tracking for pest management improvement, deliverables and performance indicators	37
Table 10: Metrics to monitor Strategy achievements	44

List of Figures

Figure 1: Generalised invasion curve (adapted from Biosecurity Victoria)	9
Figure 2: Program improvement and adaptive management under MERI framework (Australian Government Land and Coasts 2009)	43

1 | Introduction

Pests in Australia cause major economic, environmental, and social impacts at local, regional, and national scales. They inhabit a broad variety of habitats such as agricultural regions, forested lands, arid environments and urban areas and can have a significant impact on biodiversity by out-competing native plants and animals for resources, spreading disease, preying on native fauna and contributing to erosion and waterway degradation.

In Australia, pest management is the responsibility of all land managers, whether private or public. The Australian Government works with the states and territories to develop strategies to undertake research and fund key management activities. Under the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* and the *NSW Biodiversity Conservation (BC) Act 2016*, several pest flora and fauna are recognised as threats to native animals and plants. The impacts of some pest species have been listed as Key Threatening Processes and species-specific plans to reduce the threats they pose have been developed in some cases.

The *Biosecurity Act 2015* and its supporting regulations gives NSW the essential regulatory tools and powers to manage pests and minimise biosecurity threats to the NSW economy, environment and community. Under the *Biosecurity Act*, pests are not defined by species but can be considered as any species (other than native species) that present a biosecurity threat. The Act places the responsibility on land managers to take actions to prevent, eliminate or minimise biosecurity risks to manage their general biosecurity duty.

Integrated Pest Management (IPM) is an approach that establishes a sustainable methodology to managing pests by combining biological, cultural, physical and chemical tools in a way that minimises economic, health and environmental risks. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment.

The Food and Agriculture Organisation of the United Nations defines IPM as:

"The careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimise risks to human health and the environment"

Liverpool City Council (Council) has undertaken various levels of pest management to satisfy its legislative and community responsibilities, however there is no formalised framework directing these activities. Recently, Council prepared an IPM Policy to provide a framework for the effective management of priority pest species within the Liverpool Local Government Area (LGA) in a manner that minimises potential harm to human health and the environment.

The objective of this Policy is to set an IPM framework that aims to:

- Manage pests in a manner that is consistent with legislative requirements and regional plans;
- Adopt a strategic approach to pest management to prevent pest populations becoming established;
- Adopt pest control techniques that minimise potential harm to human health and the environment; and
- Ensure that pest control measures are efficient, effective and appropriately target species that are of the greatest risk to the community, environment and economy.

The IPM Policy is to be supported by an IPM Strategy (this report), which will expand upon the Policy and provide details on priority species and actions. Where required, Pest Management Plans will then be developed to target specific priority pests that warrant detailed planning and action delivery.





1.1 Purpose

This IPM Strategy (hereafter referred to as the Strategy) has been developed to identify an improved approach to controlling pest animals and weeds. The focus of the Strategy is on the control of pests on land under the care, control and management of Council. However, the Strategy also includes biosecurity responsibilities, health related regulatory functions, and community engagement and education.

1.2 Aim

Guided by the existing IPM Policy, the Strategy addresses the purposes of the policy for specific priority pests. The Strategy aligns with Council's legislative requirements, pertinent state and regional plans, and industry best practice standards. This will lead to future species-specific plans which are currently outside the scope of the Strategy.

The overarching aims of this Strategy are as follows:

- Manage pests in a manner that is consistent with legislative requirements and regional plans;
- Adopt a strategic approach to pest management to prevent pest populations becoming established;
- Adopt pest control techniques that minimise potential harm to human health and the environment;
- Guide shared roles and responsibility of various stakeholders;
- Ensure that pest control measures are efficient, effective, and appropriately target species that are of the greatest risk to the community, environment and economy;
- Improve biodiversity assets on Council land through control of pest species;
- Manage pest species in accordance with the *NSW Biosecurity Act 2015*;
- Minimise the impacts of pest species on Council assets;
- Minimise the impacts of pest species on residential assets;
- Improve community understanding of pest species management including actions regarding community education/awareness; and
- Manage community expectations of pest species management (education and information management).

1.3 IPM Principles

The United States Environmental Protection Agency (US EPA) has developed a four-tiered approach to practising IPM as follows (EPA 2021):

- a) Set action thresholds
- b) Monitor and identify pests
- c) Prevent pests from becoming a threat
- d) Control

Further information is provided in Appendix A|.





2 | Legislative Responsibilities

While the primary legislative requirements for IPM are set by *NSW Biosecurity Act 2015*, there is a wide-ranging legislative framework applicable, along with related policies and procedures. An outline of the legislative framework with regards to IPM is included in Appendix B].



3 | Roles and Responsibilities

Shared responsibility is one of the key guiding principles with regards to IPM. Whilst the roles of the respective stakeholders vary, everyone has the same responsibility to ensure that they do not contribute to the introduction or spread of pests through their actions (Invasive Plants and Animals Committee (IPAC), 2016). An outline of the roles and responsibilities with regards to IPM is included in Appendix C|.

4 | Pest Management in Liverpool City Council

Council's current approach to pest management includes:

- Bush regeneration at priority sites;
- Asset protection and aquatic weed treatment;
- Roadside maintenance;
- Reactive actions for new incursions and high-risk species; and
- Involvement in collaborative projects.

An overview of IPM practices already utilised by Council, including several case studies are included in section 6 of this report.

4.1 Impacts

Pest species, without ongoing and informed management can present serious and deleterious impacts on:

- a) the environment or an ecosystem, including terrestrial, inland waters and marine environments;
- b) social amenity including negative impacts on human infrastructure or human health, including from infectious diseases; and/or
- c) the economy, including negative impacts on human, animal or plant life, or health and relevant abiotic aspects of primary production and/or business.

The integration of pest management practices means that each site will need individual evaluation for the best outcome, inclusive of human health, the environment and infrastructure protection. Over time, as the impacts of pest species are reduced, the resilience of the environment can be expected to increase, and management costs should decrease.



4.1.1 Economic

Recent research suggests that pest species have cost the Australian economy at least \$390 billion in the last 60 years alone (Bradshaw et al 2021). The management expenditure for pest species usually begins with eradication costs, and ultimately changes to suppression via control management as the



species becomes established (Figure 1 and Bradshaw et al 2021). As a local government, Council has finite resources with which to tackle invasions of pest species such that risk based prioritisation is followed. Therefore, the economic impact of pest species which occur but that are not prioritised by Council present financial risk should they become entrenched.

4.1.2 Environmental

Liverpool LGA possess numerous environmental assets including the Georges and Nepean Rivers, Chipping Norton Lakes and several bushland areas. The southeastern portion of Liverpool is controlled by the Department of Defence and is a significant natural environment asset. There is an estimated 10,700ha of vegetation communities in Liverpool LGA of which over half are listed as Threatened Ecological Communities under state and/or federal legislation. Furthermore, there are an estimated 29 threatened flora species, 52 threatened fauna species, 16 migratory species and two endangered populations thought to occur in the LGA. Liverpool LGA is a fast-growing area of Greater Sydney and as such there is extensive and ongoing development. This has the potential to disturb and fragment high environmental value areas and create favourable conditions for pests to proliferate.

4.1.3 Social

Pest species can have considerable negative social impacts. The predation of livestock, although less common in Liverpool LGA has significant social and psychological effects on landholders. In addition, pests can damage infrastructure and culturally important sites, present a health risk via zoonotic disease transmission, and display nuisance behaviours such as disruptive noise and overpopulation causing community frustration (see section 10.3.2).

4.2 Challenges

Council's current approach to pest management faces several challenges which have been considered in the preparation of this Strategy including but not limited to:

- Responding and adapting to the ongoing and changing status of pest species in Liverpool LGA;
- Misalignment of prioritization perceptions between Council and community;
- Limited knowledge and education within parts of internal government and community on responsibilities, pest management priorities and obligations;
- Limited coordination and partnership with neighbouring Councils, land managers, and stakeholders on landscape scale pest management;
- Lack of systematic approach for monitoring and reporting; and
- Limited funding and allocation prioritization framework

4.3 Risks

The common message across all levels of government is that pest management is a shared responsibility regardless of land tenure and is premised on risk. A systematic, robust and consistent management framework should be in place during any pest management to ensure the following risks are considered:

- Human health and safety;
- Biosecurity and the environment; and
- Infrastructure and responsible financial management.





This Strategy facilitates the adoption of IPM practices that reduce risk while attaining desired outcomes and legislative requirements.



5 | Management Priorities

With limited resources to address the risks and impacts of pest species, activities and investment must be prioritised. Pest species prioritisation is largely based on risk-based decision making regulated under the Biosecurity Act in terms of risk posed to the environment, community and economy.

This approach ensures that pest prioritisation is:

- Reasonably practicable;
- Matched to the degree of risk posed; and
- Flexible and non-prescriptive.

These goals are relevant to the stages of invasion on a generalised invasion curve (Figure 1). Pest species management can be classified under four approaches: Prevention, Eradication, Containment and Asset-Based Protection. These four approaches are aligned with the invasion process from arrival to widespread establishment. The invasion curve highlights the relationship between the stages of invasion, the level of effective control that can be expected and the likely return on investment.

5.1 Nuisance vs. Priority Pests

The classification of a pest as either a nuisance or priority species is multifaceted and fluid. While some species may be listed as priority at a national or state level, there may be a lower risk at a local level. This is based on the stage of invasion, perceived impacts or invasiveness which may not warrant priority action, in which case the species may be better defined as a nuisance pest.

Pest species categorisation must be determined on a case-by-case basis and continually reviewed based on monitoring and reporting. Overall, this is a risk-based approach and at a local level would include assessing each pest's:

- Invasiveness;
- Impacts; and
- Potential distribution.

Furthermore, the feasibility of pest management must consider:

- Control costs;
- Persistence; and
- Current distribution.

A priority pest should then be defined as fulfilling most or all of the following descriptors:

- A species which presents a high risk with respect to its current position on the invasion curve and/or its ability to establish reproduce and spread such that significant management costs, prolonged persistence or increase in current distribution are predicted;
- A species which presents a high risk with respect to economic, environmental and social impacts such that significant management costs, prolonged persistence or increase in current distribution are predicted;
- A species which presents a high risk in terms of potential distribution and progression on the invasion curve if left unmanaged such that significant management costs, prolonged persistence or increase in current distribution are predicted; and
- The species is recognised as a high risk under state and or federal legislation and management plans.

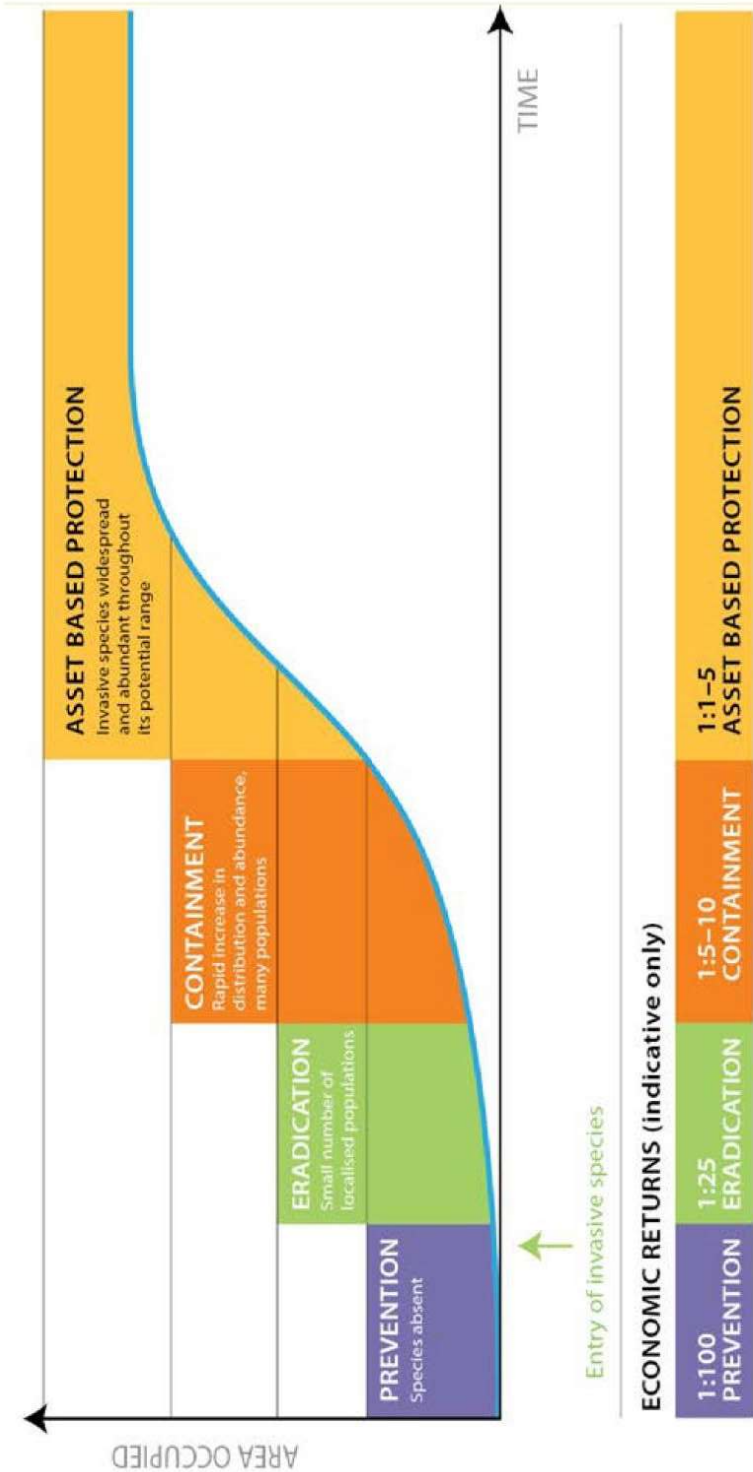


Figure 1: Generalised invasion curve (adapted from Biosecurity Victoria)



Conversely, a nuisance pest should then be defined as fulfilling most or all of the following descriptors:

- A species which has the potential to present a high risk if it progresses on the invasion curve such that its ability to establish reproduce and spread causes significant management costs, prolonged persistence or increase in current distribution are predicted, but is not currently progressed on the invasion curve at a local level;
- A species which presents a potential high risk with respect to economic, environmental and social impacts such that significant management costs, prolonged persistence or increase in current distribution are predicted, but is not currently progressed on the invasion curve at a local level; and
- The species may or may not be recognised as a high risk under state and or federal legislation and management plans.

It should be noted however, the above descriptors of a priority or nuisance pest are flexible and non-prescriptive. It is essential that vigorous and ongoing monitoring and surveillance are undertaken as prescribed in this Strategy to ensure that pest species are prioritised in an accurate and timely manner that is reflective of current circumstances. This feasibility of IPM is inextricably linked to the relationship between the stages of invasion, the level of effective control that can be expected and the likely return on investment.

5.2 Priority Pests

A list of priority pest animals and weeds has been decided by Council and the priority matrix is included in Appendix D]. The following species are currently identified as priority pests in Liverpool LGA. This list of priority pests will be the subject of regular reviews to respond to new incursions and priorities.

a) Fauna

- Cat (*Felis cattus*);
- European Fox (*Vulpes vulpes*);
- Feral Pig (*Sus scrofa*);
- Deer (*Cervidae sp*); and
- Mosquito (*Culicidae sp*).

b) Flora

- African Boxthorn (*Lycium ferocissimum*);
- Alligator Weed (*Alternanthera philoxeroides*);
- Asparagus weeds (*Asparagus spp.*);
- Blackberry (*Rubus fruticosus*);
- Boneseed and Bitou Bush (*Chrysanthemoides monilifera sub monilifera and rotundata*);
- Cat's Claw Creeper (*Dolichandra unguis-cati*);
- Chilean Needle Grass (*Nassella neesiana*);
- Coolatai Grass (*Hyparrhenia hirta*);
- Fireweed (*Senecio madagascariensis*);
- Frogbit (*Limnobium spp*);
- Kei Apple (*Dovyalis caffra*);
- Lantana (*Lantana camara*);
- Ludwigia (*Ludwigia peruviana*);
- Madeira Vine (*Anredera cordifolia*);
- Opuntia (*Opuntia spp.*);
- Salvinia (*Salvinia molesta*);



- Skunk Vine (*Paederia foetida*);
- Tiger Pear (*Opuntia aurantiaca*);
- Water Hyacinth (*Eichhornia crassipes*); and
- Willows (*Salix* spp.)

5.3 Nuisance Pests and Weeds of Concern

The following species are identified as nuisance pests in Liverpool LGA. It is recognised that management of these species is required and this is the subject of general actions, as prescribed (Section 8.2.1 and 8.2.4).

a) Fauna

- Feral Goat (*Capra hircus*);
- Red-eared Slider Turtle (*Trachemys scripta elegans*);
- Indian/Common Mynah Bird (*Acridotheres tristis*);
- European Carp (*Cyprinus carpio*);
- Cane Toad (*Rhinella marina*);
- Rabbit (*Oryctolagus cuniculus*); and
- Feral Pigeon (*Columba livia domestica*).

b) Flora

- African Olive;
- Other widespread woody weeds in Liverpool LGA:
 - Castor Oil Plant,
 - Green Cestrum,
 - Privets,
- Other environmental weeds of concern in Liverpool LGA:
 - Balloon Vine,
 - Crofton Weed,
 - Japanese Honeysuckle,
 - Morning Glory,
 - Mother of Millions,
 - Pampas Grass.



5.4 Native Species

Native species are not within the scope or intent of the Strategy. While there have been some complaints pertaining to native species (see section 10.3.2), Council's stance on this matter is that a shifted focus on community education to highlight that native species are protected under the *NSW National Parks and Wildlife Act 1974* and simple measures such as restricting food sources would assist



in lessening reports of nuisance native species. There are also specific requirements associated with the management of native species that are best addressed in a specific plan. As such, this Strategy does not discuss in any further detail management of native species by Council.



6 | Current Integrated Pest Management Practices

6.1 Bush Regeneration at Priority Sites and Broadscale Weed Management Practices

Environment Restoration Plan (ERP) site restoration occurs in Liverpool LGA on a project-by-project basis within sites nominated by stakeholders, community, and Council. These sites are not always considered the best candidates from a conservation priority perspective. For instance, historical ERP sites selections have often been popular public areas, small in size, constrained by adjacent land uses or in poor condition. Council's priority is to protect higher conservation value bushland to improve biodiversity outcomes.

Council undertakes varying levels of proactive management for priority weeds and weeds of concern throughout the Liverpool LGA. There is a focus on reducing herbicide demand however acknowledging that limitations of non-pesticide alternatives are such that they can be more costly and less effective. Council undertakes its herbicide applications in public areas such as Council owned or controlled parks, bushland, and roadsides in line with its Pesticide Use Notification Plan (PNP). This pesticide use notification plan has been prepared in accordance with the requirements of the *Pesticides Regulation 2009*. The plan sets out how Council notifies members of the community of pesticide applications it makes or allows to be made to public places that it owns or controls. Pesticide use in certain public areas for instance adjacent to playgrounds, are not always welcomed by community and as such have been the subject of trial pesticide free weed management (see Case Study One).

Case Study One – Sugar Trial

Council undertook a trial at Wattle Grove Lake to reduce weed infestations including Cobblers Pegs (*Bidens pilosa*) using sugar. The trial was based on a CSIRO study which found that sugar reduces seed germination rates of some herbaceous weeds. Sugar was applied to a test plot, which was adjacent to a control plot that did not have sugar applied. Both plots were weeded and mulched. Sugar was reapplied to the test plot three months later. Within the first three months, limited Cobblers Pegs plants were present, and at six months no Cobblers Pegs plants were germinating. Results have persisted past the six month treatment period. The trial results reduced the reliance on herbicide use and paved the way for more economical and environmentally friendly weed control alternatives.

Weed management in Liverpool LGA tends to follow yearly programs that are not formalised and fulfil an estimated 95% of Council's legislative responsibilities. There are provisions to engage contractors who use spraying and manual removal for target weed surveillance and controls. However, this varies according to seasons and favourable conditions.

On private properties Council undertakes biosecurity compliance inspections and can issue notices for cleanup to landowners under the *Local Government Act 1993 (LG Act 1993)*. A statutory order under the *LG Act* is served by Council in circumstances when land, or premises, is not in a safe or healthy condition. The owner/occupier of the premises is required to undertake actions that are specified in the order, to ensure the land, or premises, is kept in a safe or healthy condition (s124 of the *LG Act*). Council may impose penalties upon owners/occupiers who fail to comply with this order. This action is guided by Council's Overgrown Vegetation Enforcement Standard (2021) which contains specific



criteria and exemptions to be considered when determining whether enforcement action can be taken under Order No 21.

The use of fire such as cultural burns to achieve bushland regeneration and pest management outcomes is of interest to Council but is not formalised and as such does not form part of this Strategy. Schedule 1 of the Protection of the Environment Operations (Clean Air) Regulation 2021 specifies that all burning is prohibited except with approval.



6.2 Asset Protection and Aquatic Weed Treatment

Council undertakes varying levels of proactive management for aquatic weeds throughout the Liverpool LGA. Notifications of online sales of prohibited aquatic plants are intercepted to prevent the sale and trade of prohibited matters.

Council undertakes annual control and regular surveillance of aquatic weeds at multiple sites (case study three) with a focus on assets identified as outbreaks on the Liverpool section of Nepean River, water sensitive urban design assets, roadsides, parklands, and bushland areas. Council also occasionally assists rural property owners who have priority aquatic weeds onsite.

6.3 Roadside Maintenance

Weed management on roads and road reserves within Council responsibility falls under *NSW Biosecurity Act 2015, Schedule 1 Part 3*, Duty to control weeds on roads and *Roads Act 1993 Part 9, Division 3: Section 142*.

Slashing and spraying of weeds is undertaken along roadsides by Council. However, there are no formalised work protocols with respect to hygiene practices to lessen weed spread such as washdown procedures, methods of priority weed reporting, or weed identification guides.

6.4 Reactive Actions for New Incursions and High-risk Species

Council's reactive actions to new incursions and high-risk species are largely governed by achieving legislative responsibilities under the Biosecurity Act. Ongoing proactive management of priority weed species are undertaken by Council's bush regenerators on Environment Restoration Plan sites. However, there are no formalised work protocols with respect to hygiene practices to lessen weed spread such as washdown procedures, methods of priority weed reporting, or weed identification guides.

There is limited capacity to address community complaints to pests which are not considered priority under regional and state plans. However, occasionally one-off funding has been allowed for the management of weeds such as an African Olive infestation at Glen Regent Reserve. These occasions are usually short-term and are not part of ongoing funding or management.

LLS is the leading support agency for priority weed management in Liverpool LGA which allows for funding and support for reactive actions against priority pests recognized under the Act. In some circumstances, priority pest animal incursions in the Liverpool LGA may present opportunity for reactive management in association with LLS (Case Study Two).



Case Study Two – Feral Pig at Voyager Point

Council bushland officers contacted the Greater Sydney LLS biosecurity team after observing evidence of feral pig activity at Voyager Point. Under the *LLS Act 2013* there is a Pest Control Order for Feral Pigs released in 2016 meaning that Council has a responsibility to destroy any that are found on Council land. A camera trap was setup in a nearby residents property to monitor the pig's movements. The pig was later trapped and destroyed as per legislative requirements.

6.5 Involvement in Collaborative Projects

Council has been involved in LLS projects for certain weed and feral animal species (Case Study Two and Three). Coordination with neighbouring Councils has been explored but ongoing management programs and commitments have not been reached.

Case Study Three – Multi-agency Frogbit Infestation Response

In October 2020, Council was a part of a multi-agency environmental effort which saw teams from NSW DPI, Greater Sydney LLS, Hawkesbury River County, Camden, Liverpool, Campbelltown, Lane Cove, Strathfield, Illawarra and Wingecaribee Councils tackle nine new Frogbit (*Limnobium laevigatum*) infestations. A total of 438 properties were surveyed for Frogbit with infestations removed from Rossmore, Bringelly, Leppington and Catherine Field. Surveillance is continuing in association with LLS to eradicate all Frogbit infestations from streams, dams, wetlands and water features.



7 | Improvement to Integrated Pest Management Practices

7.1 Pest Species Management Improvement

Within this Strategy, 25 priority pest species, seven nuisance pest animals, and three weeds of concern are addressed, as discussed in detail in Appendix D| and Appendix E|. Recommended actions and improvements for the monitoring and management of these pests are included in Appendix D| and Appendix E|.

It is anticipated that Pest Management Plans would be developed as needed in the future to target specific priority pests that warrant detailed planning and action delivery. These species-specific plans are outside the scope of this Strategy.

7.2 Non Species-Specific Improvement

As per section 4.2 of this Strategy, several challenges relating to the implementation of pest management practices in Liverpool LGA are present. To address these challenges and for succinctness these are grouped into the following themes :

- **Internal governance** – issues relating to current internal Council management and coordination relating to pest management;
- **Adaptive implementation** – issues relating to ensuring that pest management activities are amenable and reflective of ever changing and evolving risks and invasion situations;
- **Resource prioritisation** – issues relating to making informed and rational decisions when considering resource allocation to ensure best outcomes for pest management;
- **Control measures** – issues relating to efficacy and feasibility of management practices when ensuring cost effect and minimal risk outcomes;
- **Educational programs & community engagement** – issues relating to community and stakeholder perceptions and expectations for Council's pest management activities and priorities (discussed in detail in section 10 of this Strategy);
- **Partnerships and collaboration** – issues relating to coordinating unified landscape scale pest management practices with neighbouring LGAs, community, regional and state governments, and other stakeholders (discussed in detail in section 10 of this Strategy);
- **Planning and development** – issues relating to coordination pest management obligations and practices for neighbouring land managers on non-council land; and
- **Pest species monitoring and tracking** – issues relating to implementing unified, systematic and ongoing reporting and monitoring of pest species distribution and management activities.

These themes are discussed in detail in section 9 in terms of possible actions, performance indicators as well as the associated responsibilities, timings and costings as outlined in section 8.

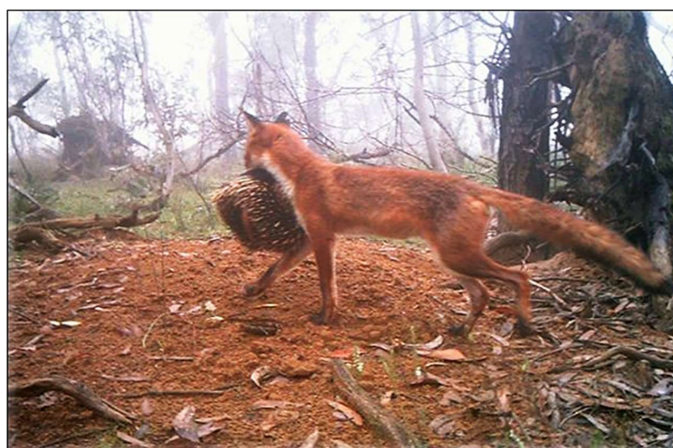
8 | Proposed Actions

8.1 Species Specific Measures for Priority Pests

Recommended actions and improvements for the monitoring and management of the following priority pests in Liverpool LGA are included in Table 1, and Appendix D| and Appendix E|.


For actions towards the priority pest species identified above, the target timeframe for containment/no further spread status species should be over three years and where the status is eradication this should be achieved in five years. For species identified for asset protection, monitoring should be undertaken to track the condition of the asset to be protected to ensure maintenance or continual improvement.


Nuisance animals and weeds of concern for Liverpool LGA, including those identified within section 5.3, will be addressed through the integrated approach outlined in the themes in section 8.2.



Species	Status	Actions	Responsibility	Budget Impact	Timing
Cat	Asset based protection	Expand education program (eg responsible pet ownership).	Community Standards	-	Ongoing
		Investigate establishing wildlife protection areas within high conservation lands.	City Works, City Environment, Property, Community Planning, Community Standards	Consultant costs (as required)	Year 1
European Fox	Asset based protection	Work collaboratively with any regional programs that are initiated.	City Works	-	Ongoing
Feral Pig	Eradicate	Ongoing surveillance of Council land to ensure early detection. Continue to work with land managers and LLS to swiftly manage any new incursion.	City Works	-	Ongoing
Deer	Contain	Continue involvement in LLS deer control program	City Works	-	Ongoing
		Work collaboratively with any ongoing regional programs that are initiated.	City Works	tbc	Ongoing
Mosquito (<i>Culicidae sp</i>)	Asset based protection	Continued implementation of Mosquito Management Plan	City Works	-	Ongoing (review Plan 2022)
African Boxthorn	Asset based protection	Continued reactive management on bush regeneration sites.	City Works	-	Ongoing
Alligator Weed	Contain	Annual control on multiple sites. Biological control (Flea Beetle) also active. Reactive management elsewhere.	City Works	-	Ongoing
Asparagus weeds	Asset based protection	Continued reactive management on bush regeneration sites. Increased staff awareness and machinery hygiene protocols to limit the spread.	City Works	-	Ongoing

Species	Status	Actions	Responsibility	Budget Impact	Timing
Blackberry	Asset based protection	Continued reactive management on bush regeneration sites. Increased staff awareness and machinery hygiene protocols to limit the spread.	City Works	-	Ongoing
Boneseed and Bitou Bush	Eradicate	Continued regular surveillance and control. Reactive management	City Works	-	Ongoing
Cat's Claw Creeper	Asset based protection	Continued reactive management on bush regeneration sites. Increased staff awareness and machinery hygiene protocols to limit the spread.	City Works	-	Ongoing
Chilean Needle Grass	Asset based protection	Continued reactive management on bush regeneration sites. Increased staff awareness and machinery hygiene protocols to limit the spread.	City Works	-	Ongoing
Coolatai Grass	Eradicate	Continued proactive management of all infestations. Increased staff awareness and machinery hygiene protocols to limit the spread. Eradicate new incursions.	City Works	-	Ongoing
Fireweed	Asset based protection	Continued reactive management on bush regeneration sites. Increased staff awareness and machinery hygiene protocols to limit the spread.	City Works	-	Ongoing
Frogbit	Eradicate	Continued proactive management. Routine monitoring and reporting.	City Works	-	Ongoing
Kei Apple	Eradicate	Continued proactive management. Large effort to remove this species	City Works	-	Ongoing
Lantana	Asset based protection	Continued reactive management on bush regeneration sites. Increased staff awareness and machinery hygiene protocols to limit the spread.	City Works	-	Ongoing
Ludwigia	Contain	Continued proactive management.	City Works	-	Ongoing
Madeira Vine	Asset based protection	Continued reactive management on bush regeneration sites. Increased staff awareness and machinery hygiene protocols to limit the spread.	City Works	-	Ongoing





Species	Status	Actions	Responsibility	Budget Impact	Timing
Opuntia	Asset based protection	Continued reactive management on bush regeneration sites. Increased staff awareness and machinery hygiene protocols to limit the spread.	City Works	-	Ongoing
Salvinia	Contain	Continued proactive management of all infestations.	City Works	-	Ongoing
Skunk Vine	Eradicate	Continued proactive management.	City Works	-	Ongoing
Tiger Pear	Eradicate	Continued proactive management including property inspections.	City Works	-	Ongoing
Water Hyacinth	Contain	Continued proactive management including property inspections.	City Works	-	Ongoing
Willows	Asset based protection	Continued reactive management on bush regeneration sites. Increased staff awareness and machinery hygiene protocols to limit the spread.	City Works	-	Ongoing



8.2 Integrated Pest Management Approach

To address the pest management related challenges in a succinct manner, eight themes have been devised and a matrix provisioned.

The approximate costs and timeframes are included in section 8.2, however it should be noted that these should be evaluated at least on an annual basis in line with a robust MERI framework (section 12).

Targets should be assessed and reported in Council's annual report as outlined in section 12 of this Strategy.

8.2.1 Internal Governance

These are actions relating to current internal Council management and coordination relating to pest management (Table 2). The actions are:

- Establish a working group to coordinate IPM implementation across the organisation. Responsibilities include:
 - Identifying and designating areas of responsibility for current and future pests;
 - Training of staff and integration of pest management into workflows; and
 - Monitoring and reporting on targets and new incursions.
- Identify or employ a responsible officer to set up IPM initiatives and address gaps. (Potentially a temporary measure until long-term solutions identified by the working group are well established)
- Develop resources including site specific strategies and species-specific pest management plans. (Documents will be developed progressively with priority given to resources that are anticipated to cause the largest positive impact for pest management)
- Staff workshops and training on pest and biosecurity issues and responsibilities.
- Integrate biosecurity considerations into all Council works, including development of task protocols.
- Weeds of concern within the region to be addressed in Plans of Management for Natural Areas in accordance with the asset-protection based management approach.

They have been identified in response to the following current challenges:

- Coordination of teams for pest management issues that span the responsibilities of multiple teams;
- Gaps and weak inter-departmental relationships where a task or responsibility is not clearly assigned;
- Limited staff knowledge of the Biosecurity Act and associated General Biosecurity Duties; and
- Biosecurity actions are not consistently being implemented as part of Council's activities.



Table 2: Internal governance pest management improvement, deliverables and performance indicators

	Actions	Performance Indicators	Responsibility	Budget Impact	Timing
1	Establish a working group to coordinate IPM implementation across the organisation. Responsibilities include: • Identifying and designating areas of responsibility for current and future pests; • Training of staff and integration of pest management into workflows; and • Monitoring and reporting on targets and new incursions.	<ul style="list-style-type: none"> • Group established with representatives from all teams with pest management responsibilities. • Meetings held, minutes taken. • Improved coordination of pest management. 	City Works, City Environment, and Community Standards	-	Ongoing from year 1
2	Identify or employ a responsible officer to set up IPM initiatives and address gaps. <i>(Potentially a temporary measure until long-term solutions identified by the working group are well established)</i>	<ul style="list-style-type: none"> • Dedicated pest management officer identified. 	City Works	1 FTE	Year 1
3	Develop resources including site specific strategies and species-specific pest management plans. <i>(Documents will be developed progressively with priority given to resources that are anticipated to cause the largest positive impact for pest management)</i>	<ul style="list-style-type: none"> • Qualitative assessment of whether there are situations where there are inadequate control monitoring and control tools to address pest animal impacts. • Number of active species-specific management plans, site specific strategies that address pest management. 	Council team that is responsible for undertaking the subject control	Consultant costs as needed	Progressively from year 1
4	Staff workshops and training on pest and biosecurity issues and responsibilities.	<ul style="list-style-type: none"> • Number of staff participating in formal and informal training events. 	City Works	Consultant costs as needed	Ongoing from year 1 (as required)
5	Integrate biosecurity considerations into all Council works, including development of task protocols.	<ul style="list-style-type: none"> • Task protocols include biosecurity considerations. • Statistics on activities under each of the seven steps of the general biosecurity duty procedure for pest animals 	City Presentation, Infrastructure & Environment	-	Ongoing

Actions		Performance Indicators		Responsibility	Budget Impact	Timing
6	Weeds of concern within the region to be addressed in Plans of Management for Natural Areas in accordance with the asset-based protection management approach.	<ul style="list-style-type: none"> Statistics on compliance with Vertebrate Pesticide Manual and Pesticide Control Order requirements. 	Service standards for weeds of concern identified in Plans of Management for Natural Areas Resources allocated in accordance with Plans of Management for Natural Areas to control weeds	Community Planning and City Works	-	Ongoing



8.2.2 Adaptive Implementation

These are actions relating to ensuring that pest management activities are amenable and reflective of ever changing and evolving risks and invasion situations (Table 3). The actions are:

- Respond to emerging pest issues, including adding species to priority pest list.
- Seek new funding and contingency funding as required to respond to spikes in pest activity, emerging pests and disturbance events. This should include external funding sources such as LLS.

They have been identified in response to the following current challenges:

- The need to respond to changing issues regarding pests and pest management, and resourcing;
- Action and species lists are snap-shots that need regular revision, not set lists;
- Management programs do not always scale up and down effectively in response to variations such as seasonal and climatic influences; and
- Accessibility and scaling of resources to manage pest issues following a disturbance event.



	Actions	Performance Indicators	Responsibility	Budget Impact	Timing
7	Respond to emerging pest issues, including adding species to priority pest list.	<ul style="list-style-type: none"> • Time taken to follow up on incursion reports • Follow-up activities (e.g. number of communication activities in local area, number of surveillance activities etc.) • Data on eradication attempts (e.g. number of eradication programs, duration/cost/area of program, outcome etc.) 	City Works [lead], City Environment, Community Standards	-	Ongoing
8	Seek new funding and contingency funding as required to respond to spikes in pest activity, emerging pests and disturbance events. This should include external funding sources such as LLS.	<ul style="list-style-type: none"> • Adequate funding sources accessed to allow for required pest management. • Funding accessed from external sources (\$). 	Council team responsible for the management of the subject pest	As required	Ongoing



8.2.3 Resource Prioritisation

These are actions relating to making informed and rational decisions when considering resource allocation to ensure best outcomes for stakeholder perceptions and pest management (Table 4). The actions are:

- Base pest management actions and resource allocation on an assessment of pest species and response against IPM invasion curve and environmental, economic and human health impacts.
- Prioritise site-based pest management actions based on conservation value.
- Develop a customer service response framework, including:
 - Customer service guidelines(e.g. flowchart);
 - Educational resources (e.g. Council website); and
 - Contacts (including external contacts).

They have been identified in response to the following current challenges:

- Managing community expectations while trying to achieve optimal operational/strategic management of pests;
- Over-burdening Council resources with non-priority issues;
- Lack of consistent direction on when and where to assign resources;
- Target areas for Environment Restoration Plan (ERP) works not always in areas of high conservation value; and
- Inadequate management of natural areas leaves them susceptible to disturbance events.



	Actions	Performance Indicators	Responsibility	Budget Impact	Timing
9	Base pest management actions and resource allocation on an assessment of pest species and response against IPM invasion curve and environmental, economic and human health impacts.	<ul style="list-style-type: none"> Resources for management activities relative to observed outcomes (e.g. changes in landholder participation, pest animal density, asset condition, reduced impacts etc.) 	IPM working group	-	Ongoing
10	Prioritise site based pest management actions based on conservation value.	<ul style="list-style-type: none"> Resources for management activities relative to the conservation value of the land. Decrease in pests in areas of high conservation value. 	City Works, City Environment	-	Ongoing
11	Develop a customer service response framework, including: <ul style="list-style-type: none"> Customer service guidelines(e.g. flowchart); Educational resources (e.g. Council website); and Contacts (including external contacts). 	<ul style="list-style-type: none"> Number of targeted communications of various forms (e.g. extension materials, e-newsletters, media coverage, social media, community meetings, email and text reminders etc.) and access figures where available (e.g. on-line page views) Improvements in knowledge, awareness, skills and attitude Decrease in number of non-priority community complaints referred to officers 	Customer Service, City Works, City Environment, Community Standards	-	Ongoing



8.2.4 Control Measures

These are actions relating to efficacy and feasibility of management practices when ensuring cost effect and minimal risk outcomes (Table 5). The actions are:

- Identify and utilise control measures that minimise impacts caused by pests in a cost effective manner that also minimises potential harm to the environment and off-target species.
- Implement early intervention measures to prevent pest outbreaks from escalating.
- Operational management of public land to contain and control existing infestations of weeds of concern.

They have been identified in response to the following current challenges:

- Impacts and public concern with some control methods;
- Effectiveness and costs of some control measures limit feasibility of their use; and
- Limited operational management of open space.



Table 5: Control measures for pest management improvement, deliverables and performance indicators

	Actions	Performance Indicators	Responsibility	Budget Impact	Timing
12	Identify and utilise control measures that minimise impacts caused by pests in a cost effective manner that also minimises potential harm to the environment and off-target species.	<ul style="list-style-type: none"> Number of, and funding for, trials into more environmentally and health conscious alternative control methods (number of alternative methods trialled, and \$ per year) 	City Works	Highly variable dependent on method.	Ongoing
13	Implement early intervention measures to prevent pest outbreaks from escalating.	<ul style="list-style-type: none"> Time taken to follow up on incursion reports Follow-up activities (e.g. number of communication activities in local area, number of surveillance activities etc.) Data on eradication attempts (e.g. number of eradication programs, duration/cost/area of program, outcome etc.) 	City Works	Highly variable dependent on method and species.	Ongoing
14	Operational management of public land to contain and control existing infestations of weeds of concern.	<ul style="list-style-type: none"> Resources allocated in accordance with Plans of Management for Natural Areas to weed control Monitoring of the extent of weeds infestations 	City Works	Highly variable dependent on method and species.	Ongoing



8.2.5 Educational programs & community engagement

These are actions relating to community and stakeholder perceptions and expectations for Council's pest management activities and priorities (discussed in detail in section 9.2 of this Strategy) (Table 6). The actions are:

- Develop a communication plan
- Use existing communication channels (website, social media, newsletters etc.) to provide community information on pest management including:
 - Information on pests, weeds, and wildlife;
 - Ways to prevent pest outbreaks and facilitate early interventions;
 - Pest species prioritisation; and
 - Empowering community to manage pest and nuisance species on their own property.
- Targeted community engagement and resources to overcome barriers in CALD communities.

They have been identified in response to the following current challenges:

- Limited community knowledge about pest species, their impacts and management.
- Community perception as to what is a pest species, as opposed to a nuisance species.
- Community expectations for management of nuisance species
- Perception of CALD communities on pest species and their management.



Table 6: Community engagement and education programs for pest management improvement, deliverables and performance indicators

	Actions	Performance Indicators	Responsibility	Budget Impact	Timing
15	Develop a communication plan	• Communication plan developed	Communications	-	Year 1
16	Use existing communication channels (website, social media, newsletters etc.) to provide community information on pest management including: • Information on pests, weeds, and wildlife; • Ways to prevent pest outbreaks and facilitate early interventions; • Pest species prioritisation; and • Empowering community to manage pest and nuisance species on their own property.	<ul style="list-style-type: none"> • Number of targeted communications of various forms (e.g. extension materials, e-newsletters, media coverage, social media, community meetings, email and text reminders etc.) and access figures where available (e.g. on-line page views) • Improvements in knowledge, awareness, skills and attitude (KASA) metrics post education programs – as determine by baseline and follow-up surveys • Indicators to be assessed through time (baseline to be collected as early as possible). Questions to align, where possible, to existing surveys (e.g. see LLS stakeholder surveys, DPI attitudinal survey and ABARES pest animal and weed management survey). 	Customer Service, Communications, City Works, City Environment, Community Standards	-	Ongoing
17	Targeted community engagement and resources to overcome barriers in CALD communities.	<ul style="list-style-type: none"> • Number of targeted communications that are inclusive of CALD communities (e.g. more language options) • Improvements in knowledge, awareness, skills and attitude (KASA) metrics post education programs – as determine by baseline and follow-up surveys. 	Communications, Community Development	-	Ongoing following development of IPM information



8.2.6 Partnerships and collaboration

These are actions relating to coordinating unified landscape scale pest management practices with neighbouring LGAs, community, regional and state governments, and other stakeholders (discussed in detail in section 10 of this strategy) (Table 7). The actions are:

- Using existing groups, communication channels and agencies as a mechanism to provide information and support to landholders, focusing on rural areas.
- Advocate to LLS for establishment of a pest management network for region.
- Partner with neighbouring councils and land managers on species specific programs, extending this to a south-west or western Sydney regional approach under the umbrella of the LLS as necessary.

They have been identified in response to the following current challenges:

- Creation of opportunities with LLS aligned with separate management outcomes;
- Limited coordination and partnering with neighbouring land managers (e.g. Councils, Sydney Water, Defence, TfNSW) to manage pests at landscape-scale; and
- Limited capacity to achieving effective management where regional approach is required (e.g. rabbit virus release and highly mobile pest species).



Table 7: Partnerships and collaboration for pest management improvement, deliverables and performance indicators

Actions		Performance Indicators	Responsibility	Budget Impact	Timing
18	Using existing groups, communication channels and agencies as a mechanism to provide information and support to landholders, focusing on rural areas.	<ul style="list-style-type: none"> Number of landholders participating in pest training activities Improvements in knowledge, awareness, skills and attitude (KASA) metrics post meetings / education programs – as determine by baseline and follow-up surveys. Number of landholders participating in coordinated management programs. Number of targeted communications that are inclusive of rural landowners. 	Council (City Works, City Environment)/LLS	-	Ongoing
19	Advocate to LLS for establishment of a pest management network for region.	<ul style="list-style-type: none"> Establishment of a regional pest management network. 	Council (City Works)/LLS	-	Ongoing
20	Partner with neighbouring councils and land managers on species specific programs, extending this to a south-west or western Sydney regional approach under the umbrella of the LLS as necessary.	<ul style="list-style-type: none"> Number of projects undertaken in partnership with other councils and land managers. 	Council (City Works)/neighbouring land managers/LLS	-	Ongoing



8.2.7 Planning and Development

These are issues relating to coordination pest management obligations and practices for neighbouring land managers on private land (Table 8). The actions are:

- Develop and enforce targets for the management of priority pests on private land to be dedicated to Council, including resources for monitoring and regulation.
- Develop guidelines for developers regarding pest management actions required as part of approvals (including VPAs) that include:
 - Pest management actions aligned with Strategy, including species specific actions.
 - Performance targets for pest species, including general weed densities and a minimum maintenance period.
 - Monitoring and reporting requirements.
- Identify funding mechanisms to cover ongoing residual pest management issues from land dedications and budget forecasting for operational management of areas dedicated to Council post-handover.

They have been identified in response to the following current challenges:

- Lack of clearly defined service standards outlining Council's expectation of developers with VPAs for open space improvements (e.g. bush regeneration) including no clear guidelines for monitoring, sign-off, and land handover.



Table 8: Planning and development for pest management improvement, deliverables and performance indicators

	Actions	Performance Indicators	Responsibility	Budget Impact	Timing
21	Develop and enforce targets for the management of priority pests on private land to be dedicated to Council, including resources for monitoring and regulation.	<ul style="list-style-type: none"> Number of land dedications guided by pest management targets 	City Works, City Environment	-	Ongoing
22	Develop guidelines for developers regarding pest management actions required as part of approvals (including VPAs) that include: <ul style="list-style-type: none"> Pest management actions aligned with Strategy, including species specific actions. Performance targets for pest species, including general weed densities and a minimum maintenance period. Monitoring and reporting requirements. 	<ul style="list-style-type: none"> Guidelines established for pest management actions required for developments. 	City Works, City Environment	-	Ongoing
23	Identify funding mechanisms to cover ongoing residual pest management issues from land dedications and budget forecasting for operational management of areas dedicated to Council post-handover.	<ul style="list-style-type: none"> Funding secured for ongoing pest management on land dedicated to Council. 	City Works	Variable dependent on condition of land at dedication	Ongoing

8.2.8 Pest Species Monitoring and Tracking

These are issues relating to implementing unified, systematic and ongoing reporting and monitoring of pest species distribution and management activities (Table 9). The actions are:

- Coordinated reporting from works crews (not only bush regeneration team) for weeds and pest animals observed in the field.
- Record private property biosecurity inspections in Pathways
- Encourage the use of FeralScan by Council staff and community members.

They have been identified in response to the following current challenges:

- No systematic approach for monitoring or reporting; and
- Limited FeralScan use to record sightings.



Table 9: Pest species monitoring and tracking for pest management improvement, deliverables and performance indicators

	Actions	Performance Indicators	Responsibility	Budget Impact	Timing
24	Coordinated reporting from works crews (not only bush regeneration team) for weeds and pest animals observed in the field.	<ul style="list-style-type: none"> Number of pests reported by works crews. 	City Works	-	Ongoing
25	Record private property biosecurity inspections in Pathways	<ul style="list-style-type: none"> Private property biosecurity inspection records created in Pathways 	City Works	-	Ongoing
26	Encourage the use of FeralScan by Council staff and community members.	<ul style="list-style-type: none"> Increase in number of pest species sightings recorded using FeralScan. 	City Works, City Environment	-	Ongoing

9 | Community Education and Engagement

Control measures for the pests covered within this Strategy contain a component of community engagement in order to minimise the impact of pests.

9.1 Commonly Reported Species

Council customer service request data was analysed for the period between January 2018 to September 2021 to identify pest species which are commonly reported as complaints to the customer service team. These results are summarised as follows:

- Cats and Pigeons are the most commonly reported species, but it is often unclear if the animals are domesticated, stray, or feral (approximately 20-30 records of each species that may relate to an animal that is not owned);
- Miscellaneous wild birds, often being a mixed flock of both introduced and native species predominantly associated with someone feeding them (18 records);
- Indian Mynas (seven records, often linked to a neighbour feeding them or other food source);
- Swarming Bees (four records);
- Rabbits (four records but given their location and description some or all may be domesticated);
- Foxes (three records - Holsworthy, Casula, and Cartwright);
- Muscovy Ducks (two records in response to an aggressive individual being dumped at Wattle Grove Lake);
- Carp (one record in Wattle Grove Lake); and
- Rodents and insects are often reported but tend to be associated with complaints regarding a neighbouring property (e.g. chicken coop or unhygienic conditions).

9.2 Education and Engagement Opportunities

Education material and engagement opportunities need to inform the community of their shared pest management responsibility, raise awareness of the work prioritised by Council, educate and assist in the identification and self-management of pests, and include community members of Culturally and Linguistically Diverse (CALD) backgrounds.

a) Interpretive Signage

It is crucial to employ clear visual signs in appropriate places in order to advise the public of issues in the area or pests to look out for. Signs can also advise of any prohibited activities such as feeding ducks or if in a Wildlife Protection Area inform the public that dogs must be on leads and that cats are prohibited. If signs are in a fishing area, they could show how to identify different aquatic weeds or fish species so that if species such as Carp or Gambusia are caught, they are informed not to release them but instead to euthanise the animal.

b) Website Information Pages

Council's website should be updated to include more robust and up-to-date information, resources and tools for the community about pests. This should be integrated with Council's customer services team to allow for the customer service team to direct complaints to these resources to reduce over burdening Council resources for non-priority issues. At a minimum there should be a webpage for:



- Priority weeds including an identification factsheet, information on Council's management practices, and details of how to report sightings (e.g., Council and the DPI Invasive Plants and Animals Enquiry Line);
- Priority animals including an identification factsheet, information on Council's management practices, and details of how to report sightings (e.g., Council and the DPI Invasive Plants and Animals Enquiry Line);
- Nuisance animals and non-priority weeds including an identification factsheet, information on Council's management practices, information on self-management if applicable, and details of when to report sightings to FeralScan, Council, and DPI Invasive Plants and Animals Enquiry Line; and
- Encouragement of resources such as Pest Tales (primary school resource), Feral Focus (secondary school resource), and NSW DPI Gateway e-learning modules.

c) CALD Communities

Liverpool is a multi-cultural LGA and as such there are often language barriers. It is therefore crucial that no matter whether the community engagement is in the form of signs, leaflets, webpages or face to face information sessions, it should be offered in multiple languages, pictures and symbols. Only if all members of the community fully understand the effect of their behaviours, can pests be successfully managed.

d) Domesticated Pets

A common theme with respect to many pest management issues, is that the problem is often exacerbated by the release of pets. Educational programs should be run informing the public of their legal responsibility with regards to this issue. Under the *BC Act 2016* it is an offence to liberate any animal (other than a captured protected animal) in NSW without authority. Part 2, Section 11 of the *NSW PCA Act 1979*, states that it is an offence to abandon an animal, providing grounds to prosecute members of the public who abandon domestic pets such as dogs and cats. As well as their legal responsibility, people should be made aware of the issues these released pets can then go onto create, such as cats and dogs preying on native wildlife.

e) Volunteer Programs and Events

Volunteer programs and community events encourage community participation, raise general community awareness and generate enthusiasm for pest management. Where appropriate and practical, these programs should be established, or existing programs should be broadcasted such as local bush care groups.

f) Citizen Science Initiatives

Cooperative research and data contribution should be encouraged among the community including the use of:

- PestSmart Connect;
- FeralScan;
- DeerScan; and
- FeralPigScan.



**LIVERPOOL
CITY
COUNCIL**



MOLINO STEWART
 ENVIRONMENT & NATURAL HAZARDS



10| Resourcing and Funding

Resource constraints and continued decline is a deciding factor for the efficacy of IPM. The following are avenues of funding which seek to increase maximise return on investment of public funds to assist in achieving the aims of this Strategy.

10.1 Environment Restoration Plan

In July 2007 Council received approval for a permanent Environment Levy called the Environment Restoration Plan (ERP). The ERP funding levy equates to roughly \$20.00 per annum for a 650m² block of land and aims to continue programs implemented by the previous environment levy as well as develop further environmental initiatives to be delivered in the Liverpool LGA.

The ERP provides a framework for the delivery of key environmental projects for the long-term benefit of Liverpool and its community. It includes an outline of the environmental projects, programs, and on-ground works to help improve the natural environment of Liverpool. A minimum of eight bush regeneration projects are to be carried out each year by qualified bush regenerators.

This ongoing initiative would assist in implementing Council's Strategy, particularly at sites recognized as high conservation significant assets.

10.2 Weeds Action Program (WAP)

The NSW Weeds Action Program (WAP) is a NSW Government grant funding initiative to reduce the adverse impact of weeds. It is guided by the NSW Biosecurity Strategy 2013-2021 and the NSW Invasive Species Plan (ISP). Approximately \$1 million is allocated to the Greater Sydney WAP project per year from the funding body, NSW DPI. Securing funding from the WAP on an annual basis would assist in implementing Councils Strategy and contribute to managing priority weeds on a regional scale.

10.3 NSW Department of Primary Industries (NSW DPI) National Agreements

NSW DPI is a signatory to national agreements relevant to biosecurity, including the Intergovernmental Agreement on Biosecurity (IGAB), the Emergency Animal Disease Response Agreement (EADRA), the Emergency Plant Pest Response Deed (EPPRD) and the National Environmental Biosecurity Response Agreement (NEBRA). These agreements outline the roles and responsibilities of government and industry in responding to nationally significant incursions of emergency animal diseases, emergency plant pests and diseases, and invasive species. These agreements also detail the funding arrangements for those responses including emergency response arrangements and cost-sharing arrangements for responses to biosecurity incidents that primarily impact the environment and/or social amenity and where the response is for the public good.

To qualify under the above mentioned agreements, a report must demonstrate that the impact is nationally significant either ecologically and environmentally and that cost-benefit is favourable in terms of feasibility of eradication. In these circumstances a comprehensive targeted pest eradication that is eligible for cost sharing and reimbursement at its completion. Knowledge of these agreements

are linked to aims of this Strategy which should be amenable to changing pest species that could present themselves in future.

10.4 Federal Government Grants

Periodically the Australian Government will provide significant funding programs targeting the research and development for pest species management. For instance, the Communities Combating Pest and Weed Impacts During Drought Program— Biosecurity Management of Pests and Weeds provided \$25 million in funding to eligible local councils to help manage the impacts of pest animals and weeds during drought. Council should continue to monitor the Government's Grant Connect website to monitor for available grant opportunities.

10.5 Other

Council supports several initiatives which undertake varying levels of pest management in the Liverpool LGA.

a) **Georges Riverkeeper Program**

The Georges River Combined Councils Committee Incorporated (GRCCC) was formed in 1979 by eight local Councils including Liverpool. The aim of the project recognises a collective responsibility for the health of the Georges River and collaboration to improve its environmental condition and ongoing management. The GRCCC provides a useful forum for the discussion of catchment issues, the facilitation of group projects and to provide a lobbying voice for local government. The Georges Riverkeeper Program has undertaken numerous projects along the river including weed management and habitat restoration.

b) **Sydney Weeds Network Inc.**

The Sydney Weeds Network (formerly Sydney Weeds Committees) is a small not-for-profit incorporated association of organisations, primarily local Councils, working together to assist in weed management across all land tenures in the Greater Sydney region.



11| Integrated Pest Management Monitoring and Recording Program

A Monitoring, Evaluation, Reporting and Improvement (MERI) framework is recommended to support this Strategy to ensure the consistency and comprehensiveness of data collection and reporting, as well as evaluate effectiveness of actions, and guide changes on pest management in Liverpool LGA.

At all stages of invasion (prevention, eradication, containment and asset protection), monitoring of pest management activities is required. Monitoring measures the effectiveness of actions in reducing the impacts of pest species and provides data about return on investment. Using this information, pest species programs can be reviewed and evaluated, and investment of resources (human and financial) realigned as required (Figure 2). The Strategy is supported by a framework to ensure that plans evolve to re-prioritise pest species and management areas and actions as required.

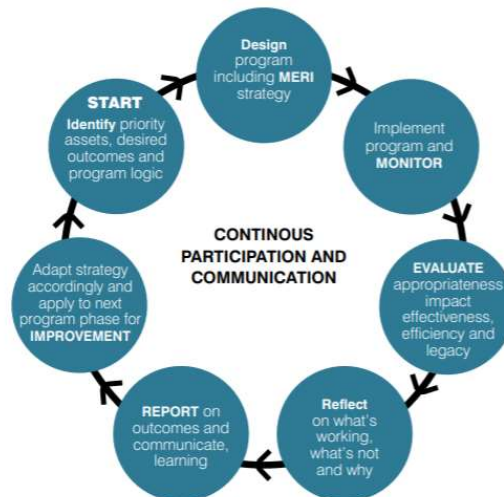


Figure 2: Program improvement and adaptive management under MERI framework (Australian Government Land and Coasts 2009)

11.1 Program Logic

Program logic is defined as the rationale behind a strategy in terms of what are understood to be the cause-and-effect relationships between program activities, outputs, intermediate outcomes and longer-term desired outcomes.

This logic underpins the MERI Framework and acknowledges that pest management operates at a range of scales and over different timeframes:

- Foundational activities—activities to inform investment, including planning, benchmarking, assessment and prioritisation.
- Immediate activities and outcomes—easily identifiable activities and related immediate goods, services and infrastructure.
- Intermediate outcomes—a combination of biophysical and non-biophysical results that lead to change by way of maintenance of and/or improvement in pest species issues.

- Longer-term outcomes—tangible and measurable changes resulting from maintenance of and/or improvement in NRM assets, including NRM organisations and institutions.

11.2 Monitoring

Monitoring involves collection and analysis of data to assist timely decision making, ensure accountability and provide the basis for evaluation and improvement. Monitoring data informs continual, broad-scale assessment through qualitative and quantitative measures of potential actions and the extent of change using two streams of monitoring data (Table 10):

- **Monitoring asset condition**—changes in the state of and trends in the condition of assets as measured at the area of investment and at higher levels through agreed indicators; and
- **Monitoring program performance**—changes in people, organisations, institutions, practices and technologies that create an environment that is conducive to improving asset condition.

Table 10: Metrics to monitor Strategy achievements

Monitoring Data for Asset Condition	Monitoring Program Performance
Baseline value	Reports of sightings and impacts by the community (e.g., through FeralScan and other mapping processes)
Target value (species specific)	Number of staff participating in formal and informal training events
Species distribution/relative abundance maps	Number of targeted communications of various forms (e.g., extension materials, e-newsletters, media coverage, social media, community meetings, email and text reminders etc.) and access figures where available (e.g., on-line page views)
Incursion reports and follow up activities	Number of landholders participating in pest management and training activities
Control effort	Funding for research projects underway
Proportion of priority pests actively managed	Resources for management activities relative to observed outcomes (e.g., changes in landholder participation, pest animal density, asset condition etc.)
Data on eradication attempts (e.g., number of eradication programs, duration/cost/area of program, outcome etc.)	Number of staff involved in pest animal management
Number of containment line breaches and data on managing breaches	Qualitative assessment of whether there are situations where there are inadequate control monitoring and control tools to address pest impacts

While quantitative data is required for direct spatial and temporal comparisons, there is a place for qualitative data and case studies to help illustrate complexity and linkages in both the biophysical and community/social aspects of pest animal management. Where possible and relevant, monitoring reports should include spatial data that is consistent with the investment design and program logic.

11.3 Evaluation

Evaluation encompasses the periodic assessment of the appropriateness of the Strategy via applied research techniques to generate systematic information that improves performance. It is critical at this stage that there is consideration given to the complexity of natural systems in order to ascertain links between pest animal management activities and changes in incursions, recorded sightings, community awareness and response and asset protection. The evaluation process should address the following matters relating to the implementation and progress of the Strategy:

- **Appropriateness** – the alignment of the program to current pest management best practice processes;
- **Impact** – the changes in asset condition, pest species distribution and whether changes are positive or negative and occurring as a direct result of the Strategy;
- **Effectiveness** – is the program attaining, or expected to attain, its objectives efficiently and in a way that is sustainable;
- **Efficiency** – are resources used providing the best value and productivity with respect to pest abatement activities; and
- **Legacy** – is the Strategy likely to allow for continued impact and effective management over time.

11.4 Reporting

Following from the evaluation of monitoring data, regular reporting intends to demonstrate the extent to which the Strategy is progressing and achieving set goals and targets. Reporting should also address shortcomings of pest management activities with achieving the goals of the Strategy. Reports should encompass:

- **Outputs;**
- **Finances;** and
- **Outcomes.**

Where possible, summary data in reports should be presented in graphical formats (maps, graphs, dashboards etc.) that are easily understood by a wide range of target audiences.

11.5 Improvement

Continuous review, learning and adaptation as informed by rigorous monitoring, evaluation and reporting is critical in attaining improved results. This process allows Council to reflect critically on the efficacy of the Strategy in terms of investments, current scientific advances, currency of best practices, program timing and target attainment.



12 | Strategy Review Schedule

Once adopted, the Strategy will commence and be deliverable through the outlined actions on a continuous improvement basis for five years, with a review at three years.



References

- Alligator Weed control manual Eradication and suppression of Alligator Weed (*Alternanthera philoxeroides*) in Australia, NSW Department of Primary Industries (DPI) (2007)
- Atlas of Living Australia (2020), *Weeds of Australia – Profiles*. Accessed November 2021 from <https://profiles.ala.org.au/opus/weeds-australia>.
- Australian Government Land and Coasts (2009), NRM MERI framework: Australian Government natural resource management monitoring, evaluation, reporting and improvement framework, Department of the Environment, Water, Heritage and the Arts, Canberra, ACT, viewed 15 December 2021,
- Bradshaw CJA, Hoskins AJ, Haubrock PJ, Cuthbert RN, Diagne C, Leroy B, Andrews L, Page B, Cassey P, Sheppard AW, Courchamp F (2021) Detailed assessment of the reported economic costs of invasive species in Australia. In: Zenni RD, McDermott S, García-Berthou E, Essl F (Eds) The economic costs of biological invasions around the world. *NeoBiota* 67: 511-550. <https://doi.org/10.3897/neobiota.67.58834>
- Brougham, KJ, Cherry, H and Downey, PO (eds) (2006). Boneseed Management Manual: current management and control options for boneseed (*Chrysanthemoides monilifera* ssp. *monilifera*) in Australia. Department of Environment and Conservation NSW, Sydney.
- Control of Aquatic Weeds in the Sydney West-Blue Mountains and Sydney North regions, Regional Weed Management Plan, NSW DPI (2010)
- Environment Protection Authority (2021) Integrated pest management – Accessed November 2021 from <https://www.epa.nsw.gov.au/your-environment/pesticides/integrated-pest-management>
- Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022, Local Land Services (LLS) (2019)
- Hampton, J, Finch, N, Watter, K & Forsyth, DM (2019), *A review of methods used to capture and restrain introduced wild deer in Australia*. CSIRO Publishing accessed November 2021 from https://www.researchgate.net/publication/322823609_A_review_of_methods_used_to_capture_and_restrain_introduced_wild_deer_in_Australia.
- Hoh (2016), *Urban fox numbers successfully reduced by Sydney councils*. Accessed November 2021 from <http://www.abc.net.au/news/2016-08-09/sydney-urban-fox-numbers-reduced/7704634>.
- Local Land Services (2018) Greater Sydney Regional Strategic Pest Animal Plan 2018 – 2023.
- Molino Stewart (2018) Draft Integrated Feral Animal Management Plan for City of Canterbury Bankstown Council
- NSW DPI (2018b) *New South Wales Weed Control Handbook – A guide to weed control in non-crop, aquatic and bushland situations 7th Edition*. NSW Department of Primary Industries.
- National framework for the management of established pests and diseases of national significance, Department of Agriculture and Water Resources, National Biosecurity Committee (2016)
- New South Wales Alligator Weed Strategy 2010–2015, NSW Department of Industry and Investment (2010)
- New South Wales Invasive Species Plan 2018-2021, NSW DPI (2018)
- NSW DPI (2021), *NSW Weedwise*, <https://weeds.dpi.nsw.gov.au/>



- NSW DPI (2021a), *Fox Control*. Accessed November 2021 from <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/foxes/fox-control>.
- NSW DPI (2021b), *Urban Foxes*. Accessed November 2021 from <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/foxes/urban-foxes>.
- NSW DPI (2021c), *Managing feral deer in NSW*. Accessed November 2021 from <https://www.dpi.nsw.gov.au/hunting/game-and-pests/managing-feral-deer-in-nsw>.
- NSW DPI (2021d), *Wild Deer*, Accessed November 2021 from <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/wild-deer/wild-deer>
- NSW DPI (2021e), *Feral pig biology and distribution*, Accessed November 2021 from <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/feral-pigs/feral-pig-biology>
- New South Wales Weeds Action Program Guidelines 2020-2025, NSW DPI (2019)
- NSW DPI (2021f), *Feral pig control*, Accessed November 2021 from <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/feral-pigs/feral-pig-control>
- OEH (2012), *Regional Pest Management Strategy 2012–17, Metro South West Region: a new approach for reducing impacts on native species and park neighbours*, Office of Environment and Heritage, Sydney.
- PestSmart, (2016) *PestSmart Factsheet: PAPP for Wild Dog and Fox Control*. Centre for Invasive Species Solutions
- Plant Health Australia (2021) PLANTPLAN: Australian Emergency Plant Pest Response Plan. Plant Health Australia, Canberra ACT.
- Saunders, G. and McLeod L. (2007), *Improving fox management strategies in Australia*. Bureau of Rural Sciences, Canberra.
- Sharp, T. and Saunders, G. (2012a) *Model code of practice for the humane control of wild dogs*
- Sharp, T. and Saunders, G. (2012b) *Model code of practice for the humane control of feral pigs*.
- Sydney Coastal Councils Group (2017) *Fox Management in southern Sydney factsheet*. Accessed November 2021 https://www.sydneycostalcouncils.com.au/sites/default/files/SSFMG-Fox_control_factsheet.pdf.
- Webb, C. (2019), *Mosquito Management Plan: Liverpool City Council, NSW, NSW Health Pathology*.
- Winkler, MA, Cherry, H and Downey, PO (eds) (2008). *Bitou bush Management Manual: current management and control options for bitou bush (Chrysanthemoides monilifera ssp. rotundata) in Australia*. Department of Environment and Climate Change (NSW), Sydney.
- Standard for Weed Management Capacity in New South Wales, NSW DPI (2019)
- Urban Cat Management Plan, Liverpool City Council (2021)
- Weeds and the Biosecurity Act A handbook for local councils and councillors in NSW, NSW DPI (2020)



Appendix A | Integrated Pest Management Principles



Integrated Pest Management Principles

The United States Environmental Protection Agency (US EPA) has developed a four-tiered approach to practising IPM as follows (EPA 2021):

1) Set action thresholds

An action threshold is a point at which pest populations or environmental conditions indicate action must be taken to prevent the pest from becoming an economic or environmental threat. Seeing a single pest does not always mean control is needed.

2) Monitor and identify pests

Identifying pests accurately and monitoring their population and behaviour helps IPM practitioners detect when action thresholds have been reached and decide on appropriate control methods.

Many weeds and insects that are considered pests are actually harmless, or even beneficial, and do not need to be controlled. Monitoring and identification reduces the risks of using the wrong type of pesticide or using pesticides when other strategies will be more effective.

3) Prevent pests from becoming a threat

Pests can be prevented from becoming a threat with minimal or no risk to people or the environment. Prevention can be highly effective and cost-efficient. Prevention methods include:

- in agriculture, selecting pest-resistant plant varieties and crop rotation; and
- in buildings, reducing clutter and maintaining good hygiene

4) Control

If prevention methods have not worked, and monitoring, identification and action thresholds indicate that pest control is necessary, the next step is to evaluate the control options. IPM prioritises methods that present the least risk to the environment and human health. These include

- physical controls such as trapping or weeding; and
- using highly targeted chemical controls such as pheromones to disrupt reproduction

If monitoring indicates that these methods are not effective, pest control methods such as targeted spraying of pesticides can be used. General spraying of non-specific pesticides is only done if all other measures have failed.



Appendix B | Legislation



Legislative Responsibilities

While the primary legislative requirements for IPM are set by *NSW Biosecurity Act 2015*, there is a wide ranging legislative framework applicable, along with related policies and procedures. An outline of the legislative framework with regards to IPM is presented below.

Relevant Legislation

- *Agricultural and Veterinary Chemicals (Administration) Act 1992 (Commonwealth)*
- *Agricultural and Veterinary Chemicals Code Act 1994 (Commonwealth)*
- *Biodiversity Conservation Act 2016 (NSW)*
- *Biosecurity Act 2015 (NSW)*
- *Biosecurity Regulation 2017 (NSW)*
- *Companion Animal Act 1998 (NSW)*
- *Crown Land Management Act 2016 (NSW)*
- *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)*
- *Fisheries Management Act 1994 (NSW)*
- *Game and Feral Animal Control Act 2002 (NSW)*
- *Local Government Act 1993 (NSW)*
- *Local Land Services Act 2013 (NSW)*
- *Pesticides Act 1999 (NSW)*
- *Prevention of Cruelty to Animals Act 1979 (NSW)*
- *Protection of the Environment Operations Act 1997 (NSW)*
- *Work Health and Safety Act 2011 (NSW)*

Related Policies and Procedures

- *Greater Sydney Regional Strategic Pest Animal Management Plan 2018-2023*
- *Greater Sydney Regional Strategic Weed Management Plan 2017-2022*
- *Liverpool City Council Animal Management Policy*
- *Liverpool City Council Environment Restoration Plan*
- *Liverpool City Council Overgrown Vegetation Enforcement Policy*
- *Liverpool City Council Pesticide Use Notification Plan for Outdoor Public Places*
- *Liverpool City Council Work Health and Safety Policy*
- *Model codes of practice and standard operating procedures for the humane capture, handling or destruction of feral animals in Australia*
- *National Threat Abatement Plans (various species)*
- *NSW Biosecurity Strategy 2013 -2021*
- *NSW Invasive Species Plan 2018-2021*
- *Standard for Weed Management Capacity in NSW.*
- *Weeds and the Biosecurity Act: A handbook for local councils and councillors in NSW*

Primary Legislative Requirements

The *NSW Biosecurity Act 2015* states that biosecurity is the responsibility of all land managers, whether private or public. Similarly, the general public have a responsibility under this Act to reduce biosecurity risks through their activities and to alert the relevant authorities when biosecurity risks are sighted. A general biosecurity duty under the Act is that anyone who knows or ought to know

about a biosecurity risk has a responsibility to prevent, eliminate or minimise the risk where reasonably practical (LLS, 2018).

Fauna

The Act also includes a number of regulatory tools which land managers should be aware of when they are controlling biosecurity risks presented by feral animals.

Under the *NSW Local Land Services (LLS) Act 2013* and *NSW Companion Animals (CA) Act 1998*, local councils are required to manage both pest and domestic animals on land that they own, occupy or manage. Under the *NSW Biosecurity Act 2015* councils have a responsibility to prevent, eliminate or minimise biosecurity risks on public land. Councils are critical in the implementation of pest control plans (DPI, 2018a & LLS, 2018).

The importation of live animals is controlled by the *EPBC Act* and the *Biosecurity Act 2015*. The importation of animals such as the African hedgehog, Veiled chameleon, Red eared slider turtle, American corn snake and Boa constrictor is classed as Prohibited Dealing under the *Biosecurity Act 2015*. It is illegal to keep these species unless authorised for example under the *NSW Exhibited Animals Protection (EAP) Act 1986* or *NSW Animal Research Act (ARA) 1985*.

Part 2, Section 11 of the *NSW Prevention of Cruelty to Animals (PCA) Act 1979*, states that it is an offence to abandon an animal, providing grounds to prosecute members of the public who abandon domestic pets such as dogs and cats, which can then go onto to prey upon native animals. In addition, Section 23 of the Act states that the use of steel-jaw traps and snares are prohibited in New South Wales. The use of cage and soft-jaw leg hold traps is however permitted for fox control.

Under the *BC Act 2016* it is an offence to liberate any animal (other than a captured protected animal) in NSW without authority.

Under the *NSW Local Government Act (LG) 1993*, councils are to adopt practices of management which are consistent with threat abatement plan objectives, where council land is identified for involvement in a threat abatement plan.

Flora

Under the *NSW Biosecurity Act 2015*, Council has a legal obligation to manage the biosecurity risk posed or likely to be posed by reducing the impacts of Priority Weeds on human health, the economy, community and environment. Under Part 3 of the *Biosecurity Act 2015*, all landowners or land managers have a 'General Biosecurity Duty' to prevent, eliminate or minimise the Biosecurity Risk posed or likely to be posed by Priority Weeds.

The Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022, developed by Greater Sydney Local Land Services, outlines the following two categories of Priority Weeds:

- 'State Priority Weeds'; and
- 'Regional Priority Weeds'.

It also lists

- 'Other Weeds of Regional Concern'.

Both 'State Priority Weeds' and 'Regional Priority Weeds' require specific control measures for individual weed species. 'Other Weeds of Regional Concern' have passed through a Weed Risk Assessment process that identifies outcomes for these weeds. This category is known as 'Local Priority Weeds'.



Appendix C | Roles and Responsibilities



Roles and Responsibilities

Shared responsibility is one of the key guiding principles with regards to IPM. Whilst the roles of the respective stakeholders vary, everyone has the same responsibility to ensure that they do not contribute to the introduction or spread of pests through their actions (Invasive Plants and Animals Committee (IPAC), 2016). An outline of the roles and responsibilities with regards to IPM is below.

Liverpool City Council

Under the NSW Biosecurity Act 2015 Council has a responsibility to prevent, eliminate or minimise biosecurity risks on public land. Council has a responsibility to manage pest animals and weeds on public land using best practice guidelines. Council should encourage responsible pest management within the community and other landholders. It should encourage the recording of feral animal and weed sightings and generate public awareness of associated issues. It should work in conjunction with other stakeholders including neighbouring councils and other governing bodies. Where Council land is identified for involvement in a threat abatement or regional strategic plan, it is to adopt practices of management which are consistent with the plan objectives.

Local Land Services

LLS works with the community and relevant stakeholders and Regional Pest Animal Committees to prepare and deliver Regional Strategic Pest Animal Management Plans.

These plans:

- Identify the priority pest species in each local area;
- Outline management outcomes for each pest type; and
- Outline local management approaches and provide local guidance on how people can contribute to managing pests.

Local Land Services:

- Continues to provide advice, education and guidance to land managers about pest management;
- Coordinates local pest management programs and Restricted Chemical Products vital for effective management of many priority pest animals; and
- Enforce the regulations when necessary.

Department of Primary Industries

The Department of Primary Industries (DPI) oversees the implementation of pest management policy in NSW. It has the lead role in administering key legislation such as the NSW Biosecurity Act. It represents the NSW Government at national forums. It releases alerts for novel species threats and provides state-wide support. It takes reports of any alert species in new areas via the NSW Invasive Plants and Animals Enquiry Line.

Environment Protection Authority

The Environment Protection Authority (EPA):

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

- administers the Pesticides Act 1999;
- develops and enforces pesticide use laws in NSW, including Pesticide Control Orders; and
- provides information and advice on the management of pesticides.

Pesticide Control Orders determine which pesticides can be used to manage pest animals and how this needs to be done.

NSW Department of Health

The Environmental Health Branch of NSW Health addresses the physical, chemical, and biological factors external to a person and the related factors that can potentially affect health. It is targeted towards preventing disease and creating health-supportive environments.

Environmental health issues include the provision of safe drinking water supplies, recreational use of water, sewage management, public swimming pools, toxicology, microbial control, skin penetration industries, funeral industries, mosquito vector management, air quality, heatwaves, waste management, and basic hygiene.

Landholders

Under the NSW Biosecurity Act 2015, landholders have a responsibility to prevent, eliminate or minimise biosecurity risks to manage their general biosecurity duty (LLS, 2018). Private land managers have a responsibility to manage any potential risks when trading feral animals for example for horticulture or agriculture and manage any vectors if they are conducting movement of goods and equipment (DPI, 2018a). They must also detect and report any new pest occurrences, cooperate and coordinate any pest management activities in conjunction with neighbours.

Bushcare Groups

Bushcare groups play a critical role in the management of pest species. This is in the form of direct removal of invasive weeds and promoting the regeneration of natural habitats increasing the available habitat for native species and discouraging pest animals. They can also assist with data collection.

Community Groups

Community groups play a critical role representing community interests with respect to pest species management. They promote collective action, support and build public awareness about pest management issues and assist with data collection (IPAC, 2017).



Appendix D| Matrix of Rationale for Pest Species Inclusion



Rationale for Pest Species Inclusion

The matrix for pest species inclusion is provided as a separate spreadsheet.



Appendix E | Discussion of Priority Pests



Discussion of Priority Species

The following are in depth profiles and the rational for inclusion for priority species identified for the Liverpool LGA. The invasion curve status in line with Figure 1 for each species has been included. It is anticipated that Pest Management Plans would be developed as needed in the future to target specific priority pests that warrant detailed planning and action delivery. These species-specific plans are outside the scope of the Strategy.

Cat (*Felis catus*)



Feral cat. Photo credit: C Potter

Status: Asset Based Protection

a) Background

With respect to pest management, cats are divided into three categories: domestic, stray and feral. Domestic cats are owned, fed and cared for. Stray cats reside in urban areas and may be lost pets. In contrast, feral cats exist as completely wild animals, without any dependence on humans. Whilst all cats, including well fed pets can have a devastating effect on native wildlife, feral cats are the ones subject to pest management (Sharp & Saunders, 2012a). Cats are carnivorous and can survive on little water, using the moisture from their prey. They can breed year-round and can have up to two litters of four kittens per year. However, most of the young do not survive (Sharp & Saunders, 2012b).

Council is not required under legislation to control feral cats; however, under the *Companion Animals Act 1998* it is the responsibility of Local Government to regulate domestic cats through identification and control of nuisance cats. Under this Act, councils may designate Wildlife Protection Areas (WPAs) from which domestic cats must be excluded. Some councils have declared some or all of their bushland reserves as WPAs to protect native fauna. Similarly, cats must be excluded from national parks and

Liverpool City Council



reserves. Predation of native wildlife by cats is listed as a key threatening process under the *NSW BC Act 2016* and the *EPBC Act 1999*.

Cats are popular as pets throughout Sydney. Therefore, when cats are sighted it is difficult to know whether they are domestic or feral unless they are caught and checked for a microchip or unless a collar is visible. In Liverpool LGA cats are among the most common species recorded as a complaint by Council, but it is often unclear if the animals are domesticated, stray, or feral (approximately 20-30 records of this species that may relate to an animal that is not owned).

b) Current Management

Council does not currently have any designated control programs in place for feral cats. Furthermore, removal of problematic individuals is limited due to restrictions under companion animal act and "no kill" shelters. Council has adopted the Liverpool Urban Cat Management Plan (29 May 2021) which prescribes a comprehensive set of actions to address the uncontrolled cat populations. This includes:

- Desexing;
- Education about containment and responsible pet ownership; and
- Identification and registration

As adapted from the plan current statistics from the Council pound and the RSPCA are:

- 27 cats were impounded in 2020 by Liverpool Animal Shelter;
- All were dumped at the shelter or picked up by animal management officers;
- None were seized after attacking someone;
- 26 were rehomed and one reclaimed;
- It took an average of 45 days to rehome a cat;
- In 2018-2019, 659 cats from suburbs in the LGA went to the RSPCA
- Of these, 69% were stray cats and 76% were kittens; and
- Out of these 659 cats, 5 were reclaimed (1.8%), 49% rehomed and 37% euthanized (50% of strays).

c) Control Options

i) Education

Cats can have a high impact on native fauna even within their own backyard, particularly if the garden is close to remnant native vegetation. It is vital to drive public education with respect to the impact of cats. It is recommended that households keep their cats indoors, particularly at night time. Alternatively, households could build a cat run in their garden. It is also recommended that cats are made to wear collars with bells. Multiple bells are best, as there is anecdotal evidence to suggest that cats can learn to move in a way that will silence a single bell so that they can still ambush prey (Wollongong City Council, 2018). In addition, cats should be de-sexed so that they can't breed with feral cats and increase the population further.

ii) Shooting

A lethal control option is shooting which when carried out by competent shooters can be a reasonably humane method of destroying feral cats. If an animal is wounded, it must be found and disposed of immediately. Similarly, if a lactating female is shot, her dependent kittens must also be found and disposed of so as to prevent their starvation. However, shooting is quite labour intensive and therefore not very cost effective. It may have some effect if implemented over a sustained period of time, otherwise it is best suited to small, restricted areas (Sharp & Saunders, 2012b).

iii) Leg hold and cage trapping



The use of steel-jaw traps and snares are prohibited in New South Wales under the *PCA Act 1979* (Section 23) (Saunders & McLeod, 2007). The use of cage and soft-jaw leg hold traps is however permitted for feral cat control. Cage traps are most humane as they cause fewer injuries than when an animal is restrained in a leg-hold trap as animals can often struggle to break free and cause serious leg injuries in the process. Cage traps are also advantageous in that if a non-target animal is caught, it can be released unharmed. In addition, it can be conducted in areas where baiting would not be appropriate, such as in urban areas.

When placing traps, it is vital that they are checked at least once daily (Sharp & Saunders, 2012b). If conducting trapping in summer, ideally traps should be checked in the early morning and closed so no animals can enter during extreme temperatures of the middle of the day, and then reset in the evening so that animals are only contained during the cooler night temperatures. When placing traps, they should be sheltered from weather extremes as animals can suffer from exposure, thirst, starvation, shock, predation and stress myopathy as a result of capture.

iv) *1080 baiting*

Baiting with respect to feral cats is not hugely effective and as a result is not widely used. This is attributed to the fact that cats occur in low densities, have large home ranges and naturally avoid feeding on carrion unless food is scarce (Sharp & Saunders, 2012b).

If conducting baiting, the only poison currently used in Australia for feral cat control is 1080. Another issue with baiting with respect to targeting feral cats, is that often non-target species, including native animals, working dogs and livestock can eat the baits as feral cat baits are not buried or non-target animals may scavenge on the dead body of an animal that has been poisoned (Sharp & Saunders, 2012b).

v) *Exclusion fencing*

Exclusion fencing can be a successful long-term method through which to protect endangered native species. However, setting up and maintaining cat proof fences can be very costly (Sharp & Saunders, 2012b).

In addition, exclusion fencing can also restrict non-target species, altering dispersion and foraging patterns as well as causing entanglement and electrocution; it can also cause a hazard to wildlife in the event of a bushfire (Sharp & Saunders, 2012b). Fencing is therefore not a practical solution for large scale control programs.

vi) *Wildlife Protection Areas*

Under the *Companion Animals Act 1998*, Council reserves can be declared Wildlife Protection Areas. Cats are prohibited from these areas. If domestic cats are found with reserves that have been declared Wildlife Protection Areas they should be identified and returned to their owner or taken to the pound.

vii) *Challenges*

A key issue comes with the differentiation between domestic, stray and feral cats. It is Council's responsibility under the *Companion Animals Act 1998* to ensure that all domestic cats have identification and are registered. Identification can include a collar or a microchip. If this is enforced, then when cats are trapped it is easier to identify them as feral. It is important when conducting lethal control methods, to ensure that only feral and not domestic cats are targeted.

Another key issue comes with the implementation of Wildlife Protection Areas as they are difficult to enforce. The correct signage can be implemented, and the public can be made aware of any new such areas within their region, however policing these areas in order to exclude cats is extremely difficult. Preliminary fauna surveys through camera trapping and spotlighting could be employed to gain an understanding of whether cats are present within the site. However, if cats are present, the next issue is that of appropriate management strategies.

d) Implementation

Cat control programs should be integrated with rabbit and fox programs so that their populations do not increase following the removal of feral cats. When cats are removed, other feral cats will move into the area and so it is essential that management strategies are ongoing. Because of this, cat management strategies can be highly costly to run, particularly on a large scale and therefore targeted controls might be more effective, for example in areas known to be frequented by endangered fauna species.

e) Monitoring

During the course of a program, accurate records should be kept as to the number of animals that have been removed and destroyed. Similarly, records should be kept of any other pests sighted whilst doing control work, even if they were not trapped. Fauna surveys including spotlighting should be conducted before and after the implementation of a control to establish if there has been a change in feral cat numbers

Accurate records should also be kept of any complaints or sightings submitted to Council by members of the public. The public should also be actively encouraged to upload their sightings to FeralScan, enabling the collection of cat data from a large variety of sources. It is important to try to market this facility in any community engagement materials.

f) Procedures

All control measures should be conducted by a licenced pest controller and health and safety procedures should be implemented. All pest animals caught should be humanely euthanased.



European Fox (*Vulpes vulpes*)



Foxes preying on native wildlife. Photo credit: Georgeanna Story

Status: Asset Based Protection

a) Background

Foxes are widely distributed throughout the entire Greater Sydney region (LLS, 2018). In the Liverpool LGA, there have been reports of foxes detected in both rural and urban areas including on motion sensing camera. Sightings that have been submitted to FoxScan are scattered throughout the entire LGA, with no key hotspots of activity evident. Councils are required to manage foxes under the LLS *European Red Fox Pest Control Order 2014* released under the *LLS Act 2013*. Predation by foxes is listed as a Key Threatening Process under the *NSW BC Act 2016* and the *EPBC Act 1999*. They are identified as a regional priority pest with the management focus of asset-based protection. The key objective is in conserving biodiversity including threatened species, and reducing negative impacts to agricultural production, domestic pets and poultry.

Foxes are well adapted to living in urban and peri-urban environments as they are successful scavengers and opportunistic in nature. Population densities of foxes can be up to 10 times greater in urban areas compared to rural areas (DPI, 2021b) with densities reaching approximately 12 per km² compared to 1 per km² in coastal forests, 2 to 5 per km² in semi-arid and sub-alpine regions and 6 to 8 per km² in temperate grazing lands (DPI, 2021a). In the Southern Sydney Region there were estimated to be approximately 7,000 foxes (10 per km²) (Hoh, 2016).

Anecdotal observations, following consultation with numerous councils, indicate that foxes are an ever-pervasive issue, with fox numbers increasing in many areas, whilst the populations of native animals are decreasing such as Bandicoot and Antechinus (Molino Stewart, 2018). In addition, foxes have been associated with increased weed dispersal as they often use thick invasive weed species such as blackberry for shelter (Sydney Coastal Councils Group, 2017). An objective of conducting successful fox control would be to increase the abundance and diversity of ground dwelling native mammals within Council reserves and minimise fox nuisance and weed dispersal.

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

b) Current Management

Council does not currently have any control programs in place; however, can work collaboratively with other regional programs that are initiated. Actions should be consistent with the NSW Fox Threat Abatement Plan and Saving Our Species priority sites and actions.

c) Control Options

Fox control plans should be coordinated in association with LLS and other relevant landholders so that the largest impact can be had on the fox population (DPI, 2018). There are several potential control options with regards to foxes, each with its own strengths and weaknesses. A combination of control methods should be utilised to gain the maximum effect.

i) Leg-hold and Cage Trapping

The use of steel-jaw traps and snares are prohibited in New South Wales under *Section 23 of the PCA Act 1979* (Saunders & McLeod, 2007). However, the use of cage and soft-jaw leg hold traps is permitted for fox control. Cage traps are most humane as they cause fewer injuries than when an animal is restrained in a leg-hold trap as animals can often struggle to break free and cause serious leg injuries in the process. Cage traps are also advantageous in that if a non-target animal is caught, it can be released unharmed. In addition, it can be conducted in areas where baiting would not be appropriate, such as in urban areas.

When placing traps, it is vital that they are checked at least once daily (Sharp & Saunders, 2012a). If conducting trapping in summer, ideally traps should be checked in the early morning and closed so no animals can enter during extreme temperatures of the middle of the day, and then reset in the evening so that animals are only contained during the cooler night temperatures. When placing traps, they should be sheltered from weather extremes as animals can suffer from exposure, thirst, starvation, shock, predation and stress myopathy as a result of capture. Trapping is a very time-consuming exercise and trap rates can be very low. Therefore, if conducting trapping, it is critical to ensure appropriate placement of the traps and to allow for a large number of trap nights.

Contractors can be engaged to undertake trapping activities. Additionally, other Councils have programs where fox cage traps are loaned to members of the public with specific instructions. This approach could be explored to increase the capacity of fox controls in problem areas.

ii) Shooting

Shooting is a beneficial strategy in areas where it is not appropriate to lay baits or if foxes are not eating baits. Foxes can be attracted using artificial distress calls. It is critical that welfare issues are reduced and so it is recommended that a high velocity rifle that is fitted with telescopic sight is used, regardless of time of day. A spotlight of minimum 100w is also vital (DPI, 2021a). This may only be carried out by a specialist pest species contractor licensed under the *NSW Firearms Act 1996* and authorised by the NSW Police and Council. Risk management controls need to be in place, particularly where this is carried out in urban and residential contexts.

iii) 1080 & PAPP Baiting

The use of 1080 for baiting programs is controlled by the *Pesticides Act 1999* and the *1080 Pesticide Control Order 2020*. Only Authorised Control Officers (ACOs) are allowed to obtain, handle, prepare and supply 1080 baits. A 1080 poison register must be kept by the Council or contractor. Baits should be utilised at optimum time to have maximum effect on fox abundance (during Spring and Autumn) and at times critical for fledglings for native bird species. Baits should be placed at least one week before the period of highest impact. Continue baiting at weekly intervals until bait uptake is minimal. Repeat the process if foxes re-enter the area (DPI, 2021a). Baits must be in accordance with minimum distance restrictions to minimise risks to people and non-target animals. They should not be placed in areas where the distance restrictions cannot be met or where they can contaminate surface and

ground waters. Specifically, 1080 baits must not be laid within close proximity to urban areas unless the program is planned in conjunction with and is approved by an ACO. An approved program must include strategies for minimising risk to non-target animals.

Best practice guidelines dictate that baits should be placed near fences and tracks throughout the target area. They should be buried at 200 to 500m intervals, using approximately 50 baits per 500 hectares. By burying the baits, the potential for other animals to eat the baits is minimised, they keep fresher for longer and if left on site they rapidly degrade. A spade or mattock should be inserted into the soil, levered approximately 50mm, the bait should be dropped in and then the soil should be levered shut again. The bait should be buried about 10cm deep. It is essential that all sites where baits have been deployed are marked and under the 1080 PCO, any bait not taken should be collected and buried according to current guidelines.

In rural areas baits can be used to poison foxes, however in urban areas this would present a large risk to domestic pets such as dogs and as such it is not a practical method (DPI, 2021b). If concerned about the effect on non-target species, bait stations without poison can be set up to monitor activity of animal species.

Para-aminopropiophenone (PAPP) is an alternative poison to 1080 and is subject to the same controls as 1080. It is designed to be used in areas where 1080 is restricted or for land managers who would prefer not to use 1080 (PestSmart, 2016). PAPP is considered to be a humane toxin and has an antidote, which if administered by a veterinarian within one hour of bait exposure, can allow a non-target animal to recover with no long-term effect.

iv) *1080 Ejectors*

Ejectors are spring-loaded devices which are filled with 1080 and then buried in the ground with an attractant attached. As the target animal, in this instance foxes, bites the attractant, a spring-loaded plunger is triggered which punctures a capsule of toxin which is then propelled into the animal's mouth.

This method is advantageous as the capsules in which the 1080 is kept are more stable than placing the toxin in bait where it can degrade. Additionally, it has high target specificity as there is a required strength threshold in order to trigger the ejector. However, this method should be used in conjunction with other control methods (DPI, 2021a).

v) *Exclusion fencing*

When complaints are received from the public regarding loss of poultry due to fox predation, they can be advised to employ fox proofing. As foxes are able to jump, poultry pens should ideally have a roof, but if that isn't possible the fence should be at least 2m high with an overhang of 30cm. The floor of the enclosure should be reinforced with mesh, or mesh should be buried under the enclosure to prevent foxes from digging through (DPI, 2021b).

With regards to excluding foxes from larger areas such as conservation areas, they can be deterred through the use of electric fencing. A live wire can be placed approximately 200mm from the ground and offset 200mm from the fence and then another wire should be placed near the top of the fence and offset a similar distance. By having two live wires foxes are prevented from going under or over the fence. Alternatively, a 6 or 7 wire electric fence could be employed, as long as the space between the wires is sufficient to prevent them crawling through or under (DPI, 2021a).

Fencing can be very expensive to employ, and foxes can still go through at ramps, posts or over and under gates. In addition, if fencing is used for protection of an important habitat for flora and fauna, burrowing native species may dig under the enclosed area, making the fence compromised and thus allowing fox entry (DPI, 2021a).

vi) *Den fumigation*



Den fumigation can be used to destroy fox cubs, using carbon monoxide which is the only registered fumigant in Australia. The technique has been associated with an 80% reduction in cub activity. However, it is most efficient as a control measure when used in problem areas, with known active fox dens in significant zones such as near Council bushland reserves. As a general use control measure, den fumigation would not be considered cost effective (Saunders & McLeod, 2007)

vii) Habitat modification

In order to minimise the success of a fox, its habitat should be modified so as to reduce its resources such as the availability of food and shelter. Reduction in shelter can be achieved by dismantling dens when discovered, removal of dense weed species such as lantana and blackberry, and minimisation of rubbish sites. In order to remove available food, carcasses and roadkill should be removed as soon as possible and if pets are fed outside, the general public should be encouraged to remove any remaining pet food once an animal has finished eating (DPI, 2021b)..

viii) Guard animals

There is limited supporting evidence, however anecdotally it has been suggested that the use of animals such as llamas, alpacas, donkeys and dogs can reduce fox predation on vulnerable livestock and endangered animals (DPI, 2021a). This control has limited feasibility for urban and residential contexts.

ix) Challenges

As previously discussed, foxes are successful scavengers, and as such are excellent adaptors, often consuming roadkill or pet food that has been left outside. It is vital as part of fox control programs to implement community engagement in order to change public behaviours in order to remove available fox resources. As part of a community program, it is necessary to teach the public to always remove any remaining food after their pet has finished eating. Of even greater importance is to encourage the public to not actively feed foxes. In addition, the public should be encouraged to remove any dense weed species they may have on their property such as Lantana, African Olive, and Blackberry. Foxes use these as shelter and also act as dispersal agents as they eat the fruit and spread the seeds (Sydney Coastal Councils Group, 2017). As such they further the spread of these weeds, as well as increasing their own available habitat.

d) Implementation

It is recommended that Council pursue a combination of primary and secondary controls to manage foxes in the Liverpool LGA in areas with reported sightings and damage. These actions should be implemented with community engagement and weed management (blackberries).

Rabbits are a key prey item of foxes and so a rabbit control program should continue to be coordinated concurrently with the fox control program so as to reduce available food resources and potentially further suppress fox numbers (DPI, 2021a). Fox control without an equivalent level of rabbit control could lead to an increase in rabbit populations. Therefore, a fox control program should be coordinated and integrated with rabbit and cat control, as similar control methods are also used for these species.

All control measures should be conducted by a licenced pest controller and health and safety procedures should be implemented. All pest animals caught should be humanely euthanised. Implementation of management controls should prioritise the safety of the community and other species in the area, particularly those that are native. Council should also work collaboratively with other regional plans for fox management to ensure holistic management. Implementation should support fox management that is consistent with the NSW Fox Threat Abatement Plan.

e) Monitoring



Monitoring is important to determine if a formal fox control program should be pursued and to identify target areas. Accurate records of fox activity should be kept of any complaints, damage, or sightings, submitted to Council by members of the public. The public should also be actively encouraged to use and upload their observations to Feral Scan's *FoxScan*. This platform is a free resource which enables the collection of fox distribution data from range of sources which can be used to better inform pest management. By encouraging the reporting of sightings, a more accurate picture of fox distribution within the LGA can be obtained. Council should also use this resource to monitor and inform their management strategy to identify areas with higher fox sightings and nuisance.

If a control program is pursued, accurate records should be kept of the number of animals that have been removed and destroyed. Similarly, records should be kept of any other pests sighted whilst doing control work, even if they were not trapped. Spotlighting should be conducted before and after the implementation of a control program to establish if there has been a reduction in fox numbers (DPI, 2021a). However, it is worth noting that fox abundance can be difficult to accurately measure as they are secretive animals (Saunders & McLeod, 2007). Therefore, additional survey methods should also be implemented, such as camera trapping and sand pads.

f) Procedures

All control measures should be conducted by a licensed pest controller and health and safety procedures should be implemented. All pest animals caught should be humanely euthanised. Safety of the community and other species (particularly native) should be prioritised.



Feral Pigs (*Sus scrofa*)

Feral Pig. Photo credit: Christopher Hume

Status: Eradicate

a) Background

Wild pig populations have been established in Australia following the release of domestic pigs, either through escape or deliberate release. Initially pigs were only found within proximity of human settlements, however now there are many feral colonies within rural areas. Estimates of the pig population size vary greatly in Australia from 3.5 million to 23.5 million (Sharp & Saunders, 2012b). Pigs can reproduce rapidly, with females being able to produce two litters of six piglets every twelve to fifteen months (Sharp & Saunders, 2012b). As such they are widely distributed in NSW and can rapidly recover following management programs. This combined with a pig's opportunistic omnivore diet and ability to survive in a variety of habitats makes them very successful feral animals.

Feral pigs are primarily managed by the *NSW Biosecurity Act 2015* (Section 15) under general biosecurity. They are classified as a regional priority pest with the objective of eradication, containment, and asset protection to reduce impacts for biodiversity, water quality and agricultural production. Predation, habitat degradation, competition and disease transmission by feral pigs is listed as a Key Threatening Process under the *EPBC Act 1999* and the *NSW BC Act 2016*. Under the *LLS Act 2013* there is a Pest Control Order for Feral Pigs released in 2016 meaning that Council has a responsibility to destroy any that are found on Council land. Feral pigs are defined as those born in the wild, that have lived in the wild, that demonstrate wild and erratic behaviour, that are not domesticated and that have some or all the following morphological features; long coarse hair, elongated snout, sloping hindquarters.

Feral pigs can have a huge effect on native ecosystems, the agricultural industry and community. They are known to cause substantial impacts to the natural environment. They consume a large variety of native plants and animals including invertebrates, frogs, lizards, snakes, turtles and their eggs, and small ground nesting birds and their eggs. They disturb natural ecosystems through rooting up soils

Liverpool City Council



and grasslands and contribute to the spread of root-rot fungus which causes dieback disease in native vegetation. Further, they can cause major disruptions to agricultural enterprises including damage to crops, pasture, fences and water supplies, competition with livestock for pasture, and preying on newborn lambs. Additional, feral pigs are often hosts or vectors for diseases and parasites which can impact animals and humans.

Currently feral pigs are absent from most of the greater Sydney region, however there are established populations in south west Sydney as part of a larger western population in the Megalong Valley (LLS, 2018). There are also two isolated populations within the Sydney region, east of the divide near Penrith and Camden (LLS, 2018). Within the Liverpool LGA, there are reports of occasional sightings (see Case Study Two).

b) Current Management

Council does not currently have any designated control programs in place for feral pigs; however, undertake reactive management in conjunction with LLS as required. There are currently no known established populations in the Liverpool LGA. However, populations have been identified in nearby Southern Western parts of the region including Penrith and Camden so vigilant monitoring should be undertaken and should any pigs be recorded within the LGA the prevention guiding principle should be followed to inhibit the establishment of any populations.

c) Control Options

Control options for land managers should aim to reduce the risk of feral pig breeding, release into environment, accessing easy food sources and negative impacts on priority assets. Control options are best used in combined approaches and include the following:

i) Trapping

Trapping is a useful strategy in areas where baiting or shooting are not appropriate such as peri-urban and residential settings. It is also an effective technique as a follow up control, in order to prevent numbers from rising after being minimised (DPI, 2021f). To maximise effectiveness, traps should be set up where there are signs of current pig activity such as around waterholes. Trapping is a very time-consuming exercise. A study conducted by Eco Logical in 2004 commented that trap rates when targeting mammals are relatively low. A trap rate of 10% would be considered a good result (Eco Logical, 2004). Therefore, if conducting trapping it is critical to ensure appropriate placement of the traps and to allow for a large number of trap nights.

When placing traps, it is vital that they are checked at least once daily (Sharp & Saunders, 2012b). If conducting trapping in summer, traps should be checked in the early morning and closed so no animals can enter during extreme temperatures of the middle of the day, and then reset in the evening so that animals are only contained during the cooler night temperatures. When placing traps, they should be sheltered from weather extremes as animals can suffer from exposure, thirst, starvation, shock, predation, and stress myopathy as a result of capture. If any lactating female pigs are trapped their piglets should be found as soon as possible and also destroyed.

ii) Shooting (Ground & Helicopter)

Shooting from the ground can be used opportunistically as a follow up control after an initial knockdown program. Generally, this method is conducted using dogs to locate pigs and considerations need to be made to ensure humane treatment of both species. For areas inaccessible from the ground, helicopter shooting can be effective to generate an initial reduction in areas with large numbers of pigs. As a control, shooting is costly and is complex to implement in urbanised and residential areas. If used, these activities should be coordinated with other relevant multiple organisations, including the LLS. It is important to also consider shooting can disrupt pig behaviour and cause them to temporarily move to other areas and so should be planned carefully with other control programs (DPI, 2021f).

iii) Ground & Aerial Baiting

Ground baiting uses 1080 poison mixed with grain or pellets. It can only be prepared by ACOs. It is most effective when food sources are low. Poison free bait should be placed out for a minimum of three nights prior to administering the poison. Bait stations should take the form of 1000m² areas enclosed with fencing which pigs can push underneath but keeps out livestock and other non-target animals. Poisoned bait can be out for a maximum of three consecutive nights before it must all be removed. All dead pigs must be removed to prevent animals scavenging on their poisoned carcasses (DPI, 2021f).

More recently a new poison known commercially as HogGone has been trialled in parts of Australia as an alternative to 1080 which can leave environmental residue. HogGone is sodium nitrite based poison which is fatal to pigs but has no impact on non-target species such as birds or scavenging animals. Furthermore, the bait is administered using a pig-specific HogHopper which is designed to allow pigs to feed but excludes all other species.

Aerial baiting is highly restricted and must be approved by LLS based on their being no other available options for large populations (DPI, 2021f). This control is challenging in urbanised and residential context and current feral pig occurrences in Liverpool LGA don't warrant this intervention.

iv) Exclusion Fencing

Pig proof fences have been designed and can be used to protect valuable areas and assets, both of environmental and of economic significance. However, these fences rely on sustained maintenance to remain effective. This reduces its cost effectiveness for large scale control programs (Sharp & Saunders, 2012b). Additionally fencing can affect the distribution and migration of native animals.

v) Prevention

Compliance activities are identified as important regional controls in controlling the distribution of feral pig populations. New incursions are often the result of deliberate pig releases into the environment including translocations and illegal kept captive feral pigs. Investigation of reports of feral pigs in captivity or being released into the environment can prevent development of feral populations. Additionally, regular, and routine compliance checks for swill feeding of domestic pigs is important. Swill feeding is illegal in Australia and is defined as feeding pigs' food waste containing meat or other mammalian by-products. Swill may contain exotic diseases and lead to potentially catastrophic outbreaks such as foot-and-mouth disease, particularly if transmission occurs in a feral population.

d) Implementation

Control options should be guided by the scale of feral pig occurrences in the LGA. In the first instance, monitoring and prevention can be effective controls where there are no known populations. For isolated sightings, localised controls such as trapping, exclusion fencing, and ground shooting are most appropriate. However, should the population size escalate other incursions may be required. Management requires a number of methods in combination, using both primary controls to substantially reduce the population and secondary controls to reduce it further and prevent it building back up. Possible control methods are outlined here.

e) Monitoring

Accurate records should be kept of any complaints or sightings, submitted to Council by members of the public. Monitoring for the development of any established pig populations in the LGA is important to support the Greater Sydney LLS aim of eradication and no ongoing pig populations. As there are currently no known pig populations within the LGA, where reports are made, follow up should be immediate to prevent any escalation of the population establishment or size. If pigs do enter the LGA, accurate records should be kept of any pigs that are removed and destroyed. Similarly, records should be kept of any other pigs sighted whilst doing control work, even if they were not destroyed.

FeralScan's PigScan resource is available, and Council should actively encourage pig sightings and damage to be reported here. PigScan is a free resource that anyone can use to record sightings or problems caused by feral pigs. It is intended to assist government, communities, landholders, industry and pest controller to use data to support justified, effective and strategic pig management.

Council can use this to record, monitor and centralise data for sightings, damage and control actions. Community awareness and engagement materials should encourage the public to report their sightings to the PigScan website or App. As data reported on PigScan grows, this resource will become more useful to Council and other relevant stakeholders in regard to available localized information.

f) Procedures

All control measures should be conducted by a licenced pest controller and health and safety procedures should be implemented. All pest animals caught should be humanely euthanised and meet community expectations. Implementation of management controls should prioritise the safety of the community and other species in the area, particularly those that are native.



Deer (*Cervidae sp.*)

European fallow deer. Photo credit: Geoffrey Cox (CC BY 4.0)

Status: Contain

a) Background

There are six deer species within NSW, five of which are widespread (Fallow, Red, Sambar, Chital and Rusa deer). Hog deer are currently not widespread or in high densities and so are listed as an alert species for the Sydney area (LLS, 2018).

Deer are well established within the Greater Sydney region, including established populations in the Illawarra region, the Royal National Park and Hawkesbury area. There are also low to moderate numbers throughout the Wollondilly region, Central Coast and upper Hawkesbury (LLS, 2018). Within the Liverpool LGA, deer have been detected in the Western Liverpool area. Deer can have a large impact on native environments. They damage vegetation and plant growth through browsing, grazing, trampling, and antler rubbing. They can be dispersal agents for weeds by transporting their seeds. They also can affect water quality through wallowing and fecal contamination (DPI, 2021d). Additionally, community-based impacts are an increasing problem on the NSW east coast. This includes deer being a public nuisance, browsing on garden plants and causing vehicle and rail accidents. Deer can also pose significant problems for agricultural properties and enterprises including to damage fencing, crop damage and livestock conflict (injury, conflict and/or disease).

Herbivory and environmental degradation caused by wild deer is a Key Threatening Process under the *NSW BC Act 2016*. Research conducted in the research conducted locally in the Royal National Park informed this listing as it was determined deer were causing environmental impacts including damage to native vegetation and threatened ecological communities, weed dispersal and disruptions to seeding recruitment and growth.

Wild deer are considered pest animals under the *NSW Biosecurity Act 2015* and are classified as a regional priority pest with the objective of eradication, containment, and asset protection to reduce

impacts for public safety, high priority environmental assets and agricultural production. There is no formal control order under the *NSW Biosecurity Act 2015* for deer, so there is no land manager obligation to eradicate deer beyond general biosecurity duty. Under Schedule 3, Part 1 of the *Game and Feral Animal Control Act 2002* deer are declared as a game animal in NSW. Hunting is controlled and regulated with restrictions on how and when deer hunting can be carried out. However, in some areas, in order to reduce feral populations, the NSW government has suspended regulations relating to deer hunting under the *Game and Feral Animal Control Act 2002* (DPI, 2021c).

b) Current management

Council currently has a deer control program underway in partnership with Penrith Council and Local Land Services. This program undertakes control work on private properties with cooperation from land holders.

c) Control Options

Deer control across the Greater Sydney region is complex as some deer populations are managed as pests and others as game animals (LLS, 2018). Effective control can be challenging and limited as shooting is the only suitable method, and this activity can be restricted in peri-urban and residential settings, due to firearm safety concerns (LLS, 2018). Deer are an emerging threat in rural western Liverpool with established populations in Greendale and neighbouring LGAs. NSW DPI recommends deer hunting on both public and private land as an effective management control.

i) Shooting

Shooting is generally accepted as an effective control to reduce feral deer populations. This should be conducted on both public and private land as a strategy to maximize containment and eradication. The suspension of some deer hunting regulations in 2018 was extended on 16 November 2021 until November 2026 to reduce restrictions enabling more extensive deer hunting activities. This includes the following: For public land hunters written permission by DPI and game hunting licence is required, however deer seasons do not apply, and electronic devices or callers may be used; for private land hunters, do not require a game hunting licence where permission from the landholder/occupier is obtained. See Table B-1 for regulations as of November 2021. NSW DPI Hunting should be consulted for current information deer hunting licensing and other requirements.

Table B - 1: Managing Feral Deer (DPI, 2021)

Rule	Private land	Public land	Notes
Must have permission of the landholder before entering any lands to hunt deer	Yes	Yes	Public land – written permission from NSW DPI
Must hold a NSW Game Hunting Licence	N/A	Yes	Public land – Restricted class (R-Licence)
May hunt all deer species all year round	N/A	Yes	Legal season for fallow, red, wapiti and hog deer suspended
May use electronic device to hunt deer	N/A	Yes	E.g., electronic game callers now permitted

Rule	Private land	Public land	Notes
Use of spotlights prohibited	N/A	Yes	Written permission conditions 12 and 13 prohibit hunting on public land at night using firearms or bows and the use of spotlights while hunting.

ii) Trapping

A range of trapping methods are available for physical restraint of deer. In Australia, the two main designs used are corral and Clover traps (Hampton et al, 2019). Clover traps have been used successfully by other councils in Greater Sydney such as Sutherland Shire Council. Different designs are suitable for different deer species and environments. Advice from pest control experts should be consulted for the most suitable design for the context. Trapped deer should be destroyed humanely.

iii) Challenges

These control methods can be effective; however, engaging private landholders to participate in culling operations in areas where there is limited council managed/owned land, inaccessible sites, high deer numbers and large areas of private land is recommended. This can include entering into targeted private property agreements with Council to install and maintain deer traps on their property. Engagement of recreational hunters in addition to contract/pest shooters may be useful in expanding control operations, particularly in areas otherwise inaccessible.

Best practice control techniques coordinated pest control programs and activities that incorporate both primary and secondary controls. Further, managing wild deer is most effective as a coordinated approach and should promote collaboration between Council, LLS, pest controllers and landholders (including groups of neighbours where relevant).

d) Implementation

Based on the current deer distribution in the Liverpool LGA, monitoring and targeted controls are likely to be effective. Private landholders should also be engaged. If deer occurrences increase in the LGA and pose threats, a deer control program should be pursued. This should be integrated with other regional plans as they can be highly costly and cover large geographical areas.

e) Monitoring

Accurate records should be kept of any complaints or sightings, submitted to Council by members of the public. Monitoring for the development of any established deer populations in the LGA is important to support the Greater Sydney LLS aim of eradication.

Feral Scan's DeerScan resource is available, and Council should actively encourage deer sightings and damage to be reported here. DeerScan is a free resource that anyone can use to record sightings or problems caused by deer. It is intended to assist government, communities, landholders, industry and pest controller to use data to support justified, effective and strategic deer management. This is important to mitigate human-wildlife conflicts as deer increasingly encroach on urban/residential setting.

Council can use this to record, monitor and centralise data for sightings, damage and control actions. Community awareness and engagement materials should encourage the public to report their sightings to the DeerScan website or App. As data reported on DeerScan grows, this resource will become more useful to Council and other relevant stakeholders in regard to available localized information.



f) Procedures

Key expectations of the whole community where deer control is conducted are that control actions are humane and do not impose safety risks to others. Should shooting be undertaken it must be conducted by a licenced pest controller and health and safety procedures should be implemented. Any deer that are only wounded when first shot, should be located and disposed of as quickly as possible to minimise suffering. If deer populations establish in the Liverpool LGA, LLS should be consulted in regard to the Supplementary Pest Control program which can remove regulations allowing accredited volunteer hunters to be utilised.



Mosquito (*Culicidae sp.*)

Mosquito. Photo Credit: JJ Harrison (CC BY-SA)

Status: Asset Based Protection

a) Background

Mosquitoes pose pest and public health threats such as mosquito-born pathogens and nuisance-biting. This can have severe impacts for those living or undertaking recreation in close proximity to wetlands. Of the 60 different species found in the Greater Sydney region, those found in major estuarine habitats have the greatest potential impacts due to their abundances, wide dispersal from habitats, inclination to bite and proven role in pathogen transmission.

To date, there is little information about the pest in the Liverpool LGA. Studies from neighbouring LGAs can help inform the likely risks impacting the Liverpool community. For example, populations associated with the greater Georges River region pose risk through the potential transmission of arboviruses (e.g., Ross River virus (RRV) and Barmah Forest virus (BFV)) and nuisance biting.

It has been acknowledged that a regional approach to mosquito management is required. However, in the interim Council has developed a mosquito management plan for the LGA. The objective of this plan is to develop a framework to enable better management of the pest and public health risks of mosquitoes associated with local area in a sustainable way, fostering future collaboration with stakeholders and community.

b) Current Management

Reports of mosquitoes in the Liverpool LGA are received during peak seasons and are a recognized item to include as a health priority. Council has a Mosquito Management Plan (September 2019) and includes educational material on their website.

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

Based on sampling from the mosquito monitoring program in Georges River, it is expected that there is mosquito dispersal from habitats along the Georges River with the potential to affect community in eastern Liverpool LGA including the suburbs of Hammondville, Voyager Point and Chipping Norton. In addition to mosquitoes associated with wetlands along the Georges River, those of secondary pest importance linked with fresh water or brackish-water wetlands are also of concern in Liverpool LGA. These can be associated with water-holding containers within urban settings.

c) Control options

An integrated approach that combines a number of strategies is most effective at managing risks posed by mosquitoes. Efforts should be made to avoid reliance on a single strategy to prevent longer-term problems such as the development of chemical resistance.

i) Physical Controls

Targeting mosquito sources and removing breeding sites can be an effective strategy, for example draining or filling wetlands. It is important that holistic wetland/environment wellbeing is assessed for this strategy to mitigate ecosystem impacts and approval is gained where the wetland is protected. Habitat modification in the urban environment can also be highly effective. Removing sediment and vegetation from stormwater systems can improve their functioning and reduce potential mosquito habitat. These incursions require routine maintenance and major works that may be expensive.

Commercial mosquito traps can be used as an inexpensive and simple strategy. They are readily available and popular with the general community. However, proved effectiveness is limited for the reduction of populations and prevention of mosquito-borne disease.

ii) Biological Controls

Introducing aquatic predators to reduce mosquito larvae can be a successful and longer-term solution. Fish species endemic to the local area can be released as a biological agent. This strategy reduces reliance on routine application of chemical agents. This strategy is not suitable in ephemeral and/or habitats that are substantially polluted.

iii) Chemical Controls

Insecticides such as adulticides and larvicides can be applied to reduce mosquito populations. Adulticides can be rapid, flexible, and relatively cost-effective making them a suitable strategy as an emergency response to disease outbreak. Application methods can include thermal fogging, ULV and residual insecticides. Adulticides used in fogging activities can be lethal to other flying insects (e.g., dragon flies, bees) and fish. Fogging should only be used if there is great public health risk and in appropriate environmental conditions, including optimal wind and drift over waterbodies and wetlands is reduced.

Larvae control is considered more effective against mosquitoes, and with less impacts for non-target species. Larvae control can be more cost effective than adulticides; however, sustained application can be time consuming.

iv) Cultural Controls

Water-holding containers of a wide range of size and shape can be found in urban areas including backyards and other domestic settings. This includes pot plant saucers, bird baths, roof gutters and other miscellaneous items that hold water with the potential to be mosquito habitat. Enhancing community awareness and encouraging the public to adopt practices to avoid mosquito bite is an effective strategy to reduce the impacts without impacting and modifying the environment. This strategy is cost effective and should increase awareness about personal protective measures and reducing backyard mosquito habitat.



Land use planning impacts such as water sensitive urban design dense vegetation in residential areas should be considered where there is potential or known mosquito risk

v) Challenges

Whilst mosquitoes pose health risks, they do play important ecosystem roles and any pest management should minimize the impact on the environment. Additionally, as many wetlands have conservation protection, management strategies should always check the official status of the target wetland (at local, national, and international levels) and ensure any relevant approval is obtained. Where chemical control is considered necessary, larvicides are preferred over adulticides as they have minimal environmental impacts and are more target specific.

d) Implementation

A combined approach is necessary for effective result in reducing the risks posed by mosquitoes. Actions consistent with the Liverpool City Council Mosquito Management Plan (2019) and best practice should continue to be implemented. Community education is important for enhancing awareness of the pest and public health risks associated with mosquitoes and promoting personal protective measures. It is important that strategies include consideration of natural and urban land uses such as vegetation, stormwater, urban development, and water sensitive design. Surveillance, monitoring and mapping activities should inform priority target sites.

Operational and equipment costs from mosquito management and surveillance may be costly. Where feasible these activities should be coordinated with other regional programs and funding from NSW Health. As mosquito management programs can be expensive to run, strategies should be targeted and must be ongoing to ensure long-term effectiveness.

e) Monitoring

Rigorous monitoring consistent with the best practice guidelines and the Liverpool City Council Mosquito Management Plan (2019) should be conducted. This includes ongoing sampling as part of the NSW Arbovirus Surveillance and Mosquito Monitoring Program and improving community awareness and reporting of mosquito nuisance. Mapping of key local mosquito habitats and target areas should inform monitoring programs.

f) Procedures

An integrated approach to mosquito management should be employed that combines a variety of strategies (chemical, physical, cultural and biological). Risks should be minimized for mosquito-borne disease transmission and interaction between the mosquitoes and the public reduced.

As many wetlands have an official conservation status, any relevant approval should be sought prior to undertaking mosquito management in these areas.



African Boxthorn (*Lycium ferocissimum*)



African Boxthorn. Photo credit: Bob Trounce (NSW DPI)

Status: Asset Based Protection

g) Background

African Boxthorn was originally introduced to Australia from South Africa and planted as hedges for wind breaks and fences. It is now widespread in regional Australia and listed as a WoNS. African Boxthorn is a perennial thorny shrub that produces red berries and white flowers. The berries are eaten by native and non-native birds and omnivorous mammals which disperse the seeds after passing through the gut. Young plants grow quickly.

African Boxthorn is considered a major environmental problem because it invades native vegetation, forming dense impenetrable thickets that exclude other plants and reduces suitable habitat for native wildlife. This weed also provides refuge habitat for introduced pests such as rabbit, European fox, and non-native birds. The fruit of African Boxthorn also harbours several pest insect species. However, in some areas where African Boxthorn has replaced native vegetation, it can provide suitable refuge habitat for native wildlife. The large thorns of African Boxthorn can also injure livestock and degrade the quality of livestock wool. The berries, leaves and roots of African Boxthorn are all toxic to humans.

African Boxthorn is drought-tolerant and grows across New South Wales. It grows in temperate, subtropical and semi-arid regions, and is most common on the well-drained soils of the western slopes and plains, especially dry creek beds.

h) Current Management

Reactive management, only managed on bush regeneration sites.

i) Control Options



Liverpool City Council

Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

Effective long-term control of African Boxthorn requires implementing a combination of control methods. Initial caution should be applied before mechanical clearing of African Boxthorn to avoid impacting native wildlife using the plants for refuge.

i) Chemical control

There are over 400 herbicides registered for use on African Boxthorn. Herbicides cause the plant to lose the leaves and appear dead, however it may recover, or seedlings may sprout in Autumn, so follow-up application is required. The most common herbicides used include Glyphosate, Picloram, and Triclopyr. Herbicides can be applied by basal bark or cut stump treatment, year-round, and by foliar spray in Autumn when new seedlings emerge. Foliar spray is the most common method of chemical control, however, is costly and so is more suitable for smaller plants. The whole bush should be sprayed when the plant is actively growing. This will vary depending on the location and rainfall. Spraying should not occur when the plant is under stress such as from droughts, water-logging, or cold temperatures. Foliar sprays are more effective when plants have more leaves. Basal bark treatment can be used for plants with stems up to 5cm by liberally spraying the bark from ground level to 30cm high. Cut-stump treatment is suitable for larger plants and in environmentally sensitive areas. The stem should be cut off 15cm above the soil level and the herbicide should be applied immediately.

ii) Mechanical removal

Mechanical removal is effective for large infestations in non-environmentally sensitive areas. A staged approach should be adopted where it is likely native wildlife are using the bushes as refuge. The bushes can be pushed using machines. The roots should be removed as well through cultivation, and this is easiest when the soil is moist. All plant material should be burnt following mechanical removal as the thorns still pose a problem, fruits can still produce seeds, and roots may sucker and regrow.

i) Biological Controls

There are no useful agents in Australia for biological control of African Boxthorn.

ii) Prevention of spread and Education

This requires the practice of good hygiene of boots, tyres, mowing equipment etc to prevent accidental and intentional spread to un-infested regions. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through stock, produce or transported equipment. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

iii) Challenges

Control of African Boxthorn usually requires follow up after initial efforts to control regrowth and new seedling growth. Large infestations can be costly to treat with chemicals. Reinfestation can occur unless removed plants are replaced with natives.

j) Implementation

For maximum efficiency of time and funding, African Boxthorn can be treated at the same time as other priority bushy weeds such as Lantana (*Lantana camara*), Blackberry (*Rubus fruticosus* agg.), Boneseed (*Chrysanthemoides monilifera* subsp. *monilifera*) and Bitou Bush (*C. monilifera* subsp. *rotundata*).

k) Monitoring

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on monitoring regrowth after initial control efforts. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines such as the African Boxthorn best practice manual (DCCEEW).

I) Procedures

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Alligator Weed (Alternanthera philoxeroides)

Alligator weed. Photo credit: Sam Kieschnick (CC BY 4.0)

Status: Contain

a) Background

Alligator Weed is a potentially devastating weed that grows in water and on land, affecting both waterways and floodplain areas. It is listed as a Weed of National Significance (WoNS). Alligator Weed has extremely vigorous growth and great tolerance of normal control measures, which makes it a major threat to wetlands, rivers and irrigation systems.

Alligator Weed affects aquatic systems through excessive growth that restricts water use, alters aquatic ecology, excludes the growth of other plants, obstructs flows, causes problems associated with flooding and sedimentation, provides habitat for mosquitoes and degrades natural aesthetics. In terrestrial situations, impacts include degradation of agricultural land and pastures and contamination of crops, hay, turf, sand and soil.

Alligator Weed infestations across NSW are referred to as Target Areas and management strategies employed are specific to the nature of the infestations present in the Target Area. In some Target Areas, including the Greater Sydney areas, Alligator Weed infestations are long established and extensive and eradication is not considered feasible. Management strategies for these Target Areas aim for containment, suppression, and reduction of biomass and density.

In Greater Sydney the region is classified as a core infestation area where the main objective is to ensure containment of the species. Alligator Weed is widely distributed in the region. While broad scale elimination is not practicable, minimisation of the biosecurity risk posed by this weed is reasonably practicable. Land managers are to prevent spread from their land where feasible and

reduce the impact on priority assets. Additionally, under the Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): a person must not move, import into the State or sell Alligator Weed. The recognized strategic response for the region is to implement quarantine and/or hygiene protocols and manage infestations in accordance with the Priorities for the control of Alligator Weed in the Sydney Region.

As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

Alligator Weed commonly occurs within the Cabramatta Creek Catchment within Liverpool LGA as well as occasionally in rural dams. Currently Council undertakes annual treatment on multiple sites across Council owned lands. Council currently employs biological control for this pest species including the introduction of the Alligator Flea Beetle to graze on Alligator Weed infestations.

c) Control Options

i) Chemical control

This is currently the most cost-effective management strategy. In aquatic situations, eradication is not possible with the currently registered chemical glyphosate. The use of this chemical has achieved adequate long-term management, however the biology of the weed results in a 'burning off' of the plant above the water level. The 'burnt off' portions frequently break apart at the nodes, and disperse, which may be a source of additional infestations downstream. Therefore, this is best conducted with barriers in place to prevent spread, when sufficient resources are available. If a boom is to be placed across a waterway (not a farm dam) it may require a permit under the *Fisheries Management Act 1994* if it is likely to restrict the movement of fish. Glyphosate is poorly translocated into the roots of the plant, resulting in rapid regrowth in warm conditions. Permits have been granted for off label 'minor use' of other more effective herbicides, though this option is not available where water is used for irrigation, stock or where flow rates cause uncertainty as to the spread of the chemical. Eradication of terrestrial infestations is more easily achieved using Metsulfuron methyl, though this requires applications for at least two years.

ii) Mechanical removal

This has been effectively used in the past. The extensive root system necessitates the removal of a large quantity of the substrate, which can result in severe environmental consequences if used in aquatic situations. The disposal of contaminated material also presents a barrier. A permit is required to transport Alligator weed, and the weed must be either deeply buried at an approved site or burned.

iii) Biological control

The Alligator Weed Flea-beetle, (*Agasicles hygrophila*), has proved a reasonable biological control in aquatic situations, but does not make a significant impact on terrestrial infestations. Other insects subsequently introduced have not proved as successful, though investigations are continuing in Alligator weed's natural range.

iv) Prevention of spread and Education

This requires the practice of good hygiene of boots, tyres, boating trailers, mowing equipment etc to prevent accidental and intentional spread to un-infested regions, in particular west of the Dividing Ranges. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through stock, produce or transported equipment. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

v) Challenges



Alligator Weed has the ability to establish in new areas rapidly and successful control often corresponds with timely and rapid response. The challenge is to develop and deploy effective and efficient ways to contain an infestation before it becomes widespread

d) Implementation

For maximum efficiency of time and funding, Alligator Weed in waterways can be treated at the same time as other priority water weeds such as Water Hyacinth (*Eichhornia crassipes*) and Salvinia (*Salvinia molesta*).

e) Monitoring

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines such as the Alligator Weed Strategy and Alligator Weed control manual (NSW DPI).

f) Procedures

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Asparagus Weeds (*Asparagus* spp.)



Ground Asparagus. Photo credit: Bob Trounce (NSW DPI)

Status: Asset Based Protection

a) Background

Six of the ten Asparagus Weeds are WoNS including Bridal Creeper (*Asparagus asparagoides*), Bridal Veil Creeper (*A. declinatus*), Climbing Asparagus (*A. africanus*), Climbing Asparagus Fern (*A. plumosus*), Foxtail Fern (*A. densiflorus*), and Ground Asparagus (*A. aethiopicus*). The other four species include Asparagus Fern (*A. virgatus*), Ming Asparagus Fern (*A. macowanii*), Sickletorn (*A. falcatus*), and Snakefeather (*A. scandens*). These species were introduced to Australia from southern and eastern Africa during the mid to late 1800s mainly for ornamental purposes. Due to their ability to easily disperse and establish in many environments, Asparagus Weeds have spread from gardens into native bushland where they cause major negative impacts.

Asparagus Weeds tolerate a wide range of soils and climates. Most prefer shady, moist conditions, but they can withstand full sun, drought and impoverished soils. Above ground, most Asparagus Weeds have wiry, twining stems that climb over vegetation. Some species have sharp spines along the stems. They have white or cream-coloured flowers and fleshy berries. The berries are mainly consumed by birds and the introduced European Rabbit and European Fox which disperse the seeds. Asparagus Weeds are also dispersed by water and by humans as garden plants. Below ground, Asparagus Weeds have large root masses which can be up to 85% of the plant's biomass. This allows the weeds to withstand harsh conditions, including drought and fire. This also allows the weeds to spread rapidly and dominate the ground and shrub layer, outcompeting native species.



Asparagus Fern

Asparagus Fern. Photo credit: Sheldon Navie

Asparagus Fern is an erect herb or shrub originally introduced as an ornamental plant. It is an emerging environmental weed over a wide range of coastal and sub-coastal habitats. It now occurs in coastal and sub-coastal Queensland and is especially common in the south-east of that state. In New South Wales Asparagus Fern is not widespread, but occurs mostly in the Sydney district. Asparagus Fern has the potential to invade a wide range of coastal and sub-coastal plant communities, in areas north from Sydney. It competes with native ground cover and understorey plants by forming dense infestations that smother other species and prevent their germination and establishment. It can form very large, continuous infestations.

Bridal Creeper

Bridal Creeper. Photo credit: Colin G Wilson

Bridal Creeper is a garden plant with climbing stems. It is now a major weed of bushland where it smothers native plants. Bridal Creeper is now a major weed of bushland in southern Australia, where its climbing stems and foliage smother native plants. It forms a thick mat of underground tubers which

impedes the root growth of other plants and often prevents seedling establishment. Rare native plants, such as the Rice Flower (*Pimelea spicata*), are threatened with extinction by Bridal Creeper.

Bridal Creeper is widespread in south-western Western Australia, southern South Australia and eastern Victoria. It is spreading through New South Wales and Tasmania. It can grow in most soils but is most common close to the coast where it invades woodlands and other open coastal vegetation. It is particularly vigorous in alkaline sandy soils and thrives in areas high in nutrients such as drainage lines.

Bridal Veil Creeper



Bridal Veil Creeper. Photo credit: Hillary Cherry

Bridal Veil Creeper is a fern-like scrambler or low climber with light green, bluish-grey or whitish berries. It quickly outcompetes other plants and could degrade bushland in parts of coastal NSW. Bridal veil creeper can grow very densely at ground and shrub level. It also forms thick tuberous root mats. It is highly invasive and:

- smothers native ground covers and shrubs
- outcompetes native seedlings
- reduces shelter and food for native animals.

Bridal Veil Creeper is not currently known to occur in NSW. It is present in south-west Western Australia, South Australia and western Victoria.

Bridal Veil Creeper is a potential weed of roadsides, urban bushland, coastal habitats, the banks of waterways, waste areas, rocky outcrops, open woodlands, closed forests and plantations. It is suited to the climate of most of southern coastal Australia and can tolerate cold winters and frost. It can grow in a variety of soil types, including sandy soils. It grows well in both shade and full sun.

Climbing Asparagus

Climbing Asparagus. Photo credit: Sheldon Navie

Climbing Asparagus is a climber or low shrub originally introduced as an ornamental plant. It has the potential to invade a wide range of coastal and sub-coastal plant communities from Cape York to northern New South Wales, but has been recorded as far south as Sydney. It strongly competes with native ground cover and understorey plants by forming a dense mat of rhizomes and roots that can prevent the germination and establishment of other species. It can attain very large and continuous infestations.

Climbing Asparagus prefers sub-tropical to tropical regions. It is primarily found in semi-evergreen vine thickets, brigalow, wet eucalypt forests, riparian areas and littoral rainforests.

Climbing Asparagus Fern

Climbing Asparagus Fern. Photo credit: Terry Inkson (MidCoast Council, NSW)

Liverpool City Council

Integrated Pest Management
Strategy

Liverpool City Council - Final
Draft

Climbing Asparagus Fern is a wiry branching vine that invades rainforest vegetation by climbing into the forest canopy and smothering trees. It is now a serious weed of bushland and rainforests and is a WoNS.

Climbing asparagus fern prefers fertile soils in high rainfall areas. It is a shade-loving plant.

Foxtail Fern



Foxtail Fern. Photo credit: Thu Truong

Foxtail Fern is a spreading ground cover with upright stems. It has dense foliage that look like foxtails and foliage and root mats that prevent other plants from growing. It is an ornamental plant that can invade native bushland. Foxtail Fern was previously included with Ground Asparagus, but has since been classed as a separate cultivar.

Ground Asparagus



Ground Asparagus. Photo credit: Bob Trounce (NSW DPI)

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

Ground Asparagus is a low growing, perennial scrambler with arching stems. It can form dense thickets that cover large areas.

Ground Asparagus grows very densely above the ground and forms thick mats of tubers and roots underground. It is a serious environmental weed because it:

- outcompetes native plants for water and nutrients
- smothers and kills small native herbs and shrubs
- reduces habitat and restricts movement for native animals
- changes soil and leaf litter composition, affecting soil life.

Ground Asparagus competes with some threatened native plant species and plants that are within endangered ecological communities.

Ground Asparagus grows along the NSW coast from the QLD border to the Victorian border. It grows in subtropical and warm-temperate regions with 500 mm or more per year. It is drought tolerant and can survive hot, dry conditions. Although frost damages the foliage, it will regrow from the roots. Ground asparagus grows in full sun or shade. It can grow in a range of soil types and thrives in sandy soils. This weed grows in a wide range of environments including:

- sandy foredunes and coastal headlands
- littoral rainforests
- heathlands
- open woodlands
- riparian areas
- wetlands including estuarine edges, salt marshes and swamps.

Seedlings can also grow in the forks of trees, in bird's nest ferns and amongst rocks or leaf-litter.

Ming Asparagus Fern



Ming Asparagus Fern. Photo credit: Sheldon Navie

Ming Asparagus Fern is a shrubby, ornamental plant that has become a potentially serious environmental weed of the eastern and southern Australian coasts. Ming Asparagus Fern has the

Liverpool City Council



potential to invade a wide range of coastal and sub-coastal plant communities from north-east Queensland to eastern South Australia, and south-west Western Australia. It strongly competes with native ground cover and understorey plants by forming dense infestations that can smother and prevent the germination and establishment of other species. It can attain very large and continuous infestations.

Ming asparagus fern prefers semi-shaded situations. It is primarily found in the understorey of drier forests, but has the potential to invade riparian areas, forest margins, open woodlands, urban bushland, coastal environs, roadsides, disturbed sites and waste areas.

Sicklethorn



Sicklethorn. Photo credit: Sheldon Navie

Sicklethorn is a robust climber introduced as an ornamental plant. Stems become woody with age and have sharp, stout thorns that curve backwards. It is an emerging environmental weed.

Sicklethorn has the potential to invade a wide range of coastal plant communities from south-east Queensland to the central coast of New South Wales. The stems climb over and smother native vegetation up to 6 m tall. It also strongly competes by forming a dense mat of tuberous roots that can prevent the germination and establishment of other species. Sicklethorn can attain very large and continuous infestations.

Sicklethorn prefers moist, semi-shaded conditions in sub-tropical regions. Seed can germinate in conditions from full sun to greater than 80% canopy closure. It is common near human habitation and is primarily found in riparian habitats, wet sclerophyll forest, swamp oak and subtropical rainforest communities.

Snakefeather

Snakefeather. Photo credit: Courtesy of the Southern Tablelands and South Coast Regional Noxious Plants Committee

Snakefeather is a creeping or climbing vine with thornless wiry stems. It poses a serious environmental weed threat to southern Australia. It is shade tolerant and competes with native plants for water, space and nutrients. Its tuberous root system forms a dense mat that prevents native seedlings from germinating, and its climbing stems can smother small understorey plants.

In New Zealand it is the most damaging of all the asparagus weeds, and in Australia it is thought that Snakefeather could have similar impacts to those of bridal creeper (*Asparagus asparagoides*).

Infestations are scattered in Australia but are increasing, particularly in southern Victoria. There are also infestations in northern Tasmania, South Australia and south-west Western Australia. In New South Wales the worst areas of infestation are around Sydney and on Lord Howe Island.

Infestations are found close to human habitation, but modelling predicts that Snakefeather could potentially invade across coastal areas of New South Wales and central and southern Queensland.

b) Current Management

Reactive management, only managed on bush regeneration sites.

c) Control Options

Effective long-term control of Asparagus Weeds requires implementing a combination of control methods.

i) Chemical control

The most commonly used herbicides on Asparagus Weeds are glyphosate, metsulfuron-methyl, fluoroxypr, 2,4-D, picloram and triclopyr. Glyphosate, metsulfuron-methyl, and fluoroxypr are used for all Asparagus Weeds, while others are species specific or used in combination. Herbicides are usually applied by the spot-spray technique. Otherwise, for larger plants, cut stump, basal bark spray or cut and paint techniques can be applied.

ii) Mechanical removal

Methods include hand pulling, digging / grubbing, crowning, and slashing. For asparagus weeds, these are only recommended for seedlings or small plants, in small to medium-sized infestations, or when working in high-value native vegetation or around cultural or geological assets.

iii) *Biological Controls*

Three natural enemies specific to Bridal Creeper have been released in Australia: the Bridal Creeper Leafhopper (an undescribed Erythroneurini formerly referred to as *Zygina* sp.) was first released in 1999, the rust fungus *Puccinia myrsiphlli* in 2000 and a leaf beetle (*Crioceris* sp.) in 2002. The rust fungus and leafhopper have caused the most impacts. In good years, these agents can stop plants flowering and fruiting. Many more years of impacts by the agents are required to deplete the nutrient reserves stored in underground tubers and stop regrowth.

iv) *Prevention of spread and Education*

This requires the practice of good hygiene of boots, tyres, mowing equipment etc to prevent accidental and intentional spread to un-infested regions. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed. High priority should be given to new infestations and isolated patches that have not set fruit or seed to prevent dispersal. At site level, prevention of asparagus weed infestations is achieved through:

- Assessing areas on a regular basis that are free from infestation but at a high risk of asparagus invasion
- Controlling potential vectors such as feral stock if they have access to bushland.
- Treating isolated plants if found and before they set fruit.
- Thoroughly inspecting and cleaning machinery and vehicles if they have been used in known infestations before moving them to other locations.
- Raising awareness and ability to identify new asparagus weeds.
- Directing people to report any discoveries to an authorised officer who can assist with mapping the infestations and identifying control options.

Prevention and early intervention provides a high return on investment. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

v) *Challenges*

Asparagus Weeds are difficult to control because a.) they generally have large underground reserves (root masses) and b.) several species have fine or waxy foliage that impede herbicide uptake.

d) **Implementation**

For maximum efficiency of time and funding, and for maximum weed control effects, Asparagus Weeds can be treated at the same time as other priority invasive vines and scramblers.

e) **Monitoring**

Monitoring should be one of the first activities implemented at a control site. It will provide a benchmark to assess the progress at the site. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines such as the Asparagus Weeds Management Manual (NSW OEH).

f) **Procedures**

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Blackberry (*Rubus fruticosus* agg.)



Blackberry. Photo credit: Courtesy QDNRM

Status: Asset Based Protection

a) Background

Blackberry is a prickly scrambling shrub with dark-coloured berries. It forms thickets, is one of Australia's worst weeds, and is a WoNS. There are many different blackberry species making up the *Rubus fruticosus* aggregate. In NSW, the European blackberry (*Rubus fruticosus*) is most common. Blackberry has already cost around \$100 million to control and in lost production. It:

- quickly infests large areas
- forms dense thickets that restrict:
 - stock access to waterways
 - access via fire trails
- takes over pastures
- is unpalatable to most livestock
- reduces native habitat for plants and animals
- fuels bushfires
- provides shelter for rabbits and foxes
- provides food for introduced species such as starlings, blackbirds and foxes.

Blackberry can have some positives such as:

- edible fruit
- supporting pollinators
- food and shelter for some native animals and birds such as bandicoots and blue wrens
- leaves can be used in herbal medicines.

Blackberry infests about 9 million hectares of land in Australia. The *Rubus fruticosus* species in NSW grow in different areas:



- *Rubus anglocandicans* is the most common species in wetter areas of the state
- *Rubus leucostachys* is widespread
- *Rubus polyanthemus* is in Kosciuszko National Park
- *Rubus laciniatus* is in wetter areas of the state
- *Rubus ulmifolius* var. *ulmifolius* is widespread
- *Rubus ulmifolius* var. *anoplothysus* may be present in NSW
- *Rubus vestitus* is uncommon
- *Rubus leightonii* is uncommon
- *Rubus phaeocarpus* grows in the Kowmung River area.

Blackberry thrives in:

- temperate climate with a warm summer and cool winter
- annual rainfall of at least 700 mm.

Blackberry can grow in drier climates if it has access to water (e.g. along a riverbank). It does not like heavy shade. Blackberry produces a lot of seeds. There can be up to 13,000 seeds per square metre under a blackberry bush at the end of a fruiting season. Birds and animals feeding on the berries spread the seeds in their droppings. Seeds also spread by water and with soil. When first year canes (primocanes) touch the ground, they sprout roots and become new 'daughter' plants. The next year, primocanes produce short canes with flowers and berries on the end.

b) Current Management

Reactive management, only managed on bush regeneration sites.

c) Control Options

Long term control of blackberry is an ongoing process. A combination of control methods and follow up is needed.

i) Chemical control

Herbicides are the most reliable blackberry control method. Use herbicides in combination with other control methods. There are many herbicides registered for use on blackberry. A mixture of triclopyr + picloram used with or without aminopyralid gives the best long-term control. Spray healthy, actively growing plants with new leaves on the cane tips. Apply to both the outer and inner leaves. First year plants are easier to kill with herbicide. Well-established thickets may need more treatments. After slashing or burning, wait until plants have up to 1 m of regrowth before applying herbicide. Some blackberry species are more resistant to certain herbicides than others. Identify the species before choosing a herbicide.

ii) Mechanical removal

Physical control alone is rarely successful because it is hard to remove all the roots. Cultivation often spreads blackberry further. Slashing can help make access through infestations, but promotes regrowth. After slashing, use a follow-up control.

iii) Grazing

Goats can make a start on controlling heavy infestations. Goats prefer blackberry over improved pasture species. Cattle will not control blackberry infestations but can stop daughter plants from establishing. Sheep may graze blackberry seedlings if there is no other palatable feed around.

iv) Biological Controls

The leaf rust fungus *Phragmidium violaceum* is the only deliberately released biological control agent in Australia. It attacks the leaves, and infects flower buds and unripe fruit and stops blackberry producing daughter plants. *Phragmidium violaceum* spores need dew, rain or high humidity to germinate. It is most effective when:

- most of the plant's canopy is young leaves
- annual rainfall is greater than 750 mm
- rainfall is evenly spread over the year,
- January temperatures average about 20°C.

v) *Prevention of spread and Education*

Priority actions required to prevent the spread of Blackberry and to protect assets include implementing control to reduce impact at sites with significant ecological, economic or social assets and control to prevent spread from established infestations to sites with significant ecological economic or social assets.

The spread of Blackberry is often event or season-driven, and the rate of spread can be reduced considerably if land managers react to these events with appropriate measures. For example, events such as fire, floods, erosion or plant disease can cause an increase in the extent of bare areas that are vulnerable to invasion by blackberry (and many other weeds). Consequently, these areas, which may have been initially low-priority sites, may need to become a higher priority until the effects of the event have passed. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

vi) *Challenges*

Initially, it is important to identify potential challenges of controlling Blackberry. Large and dense infestations often provide significant challenges for gaining access to undertake control actions. Further, in some cases, Blackberry can provide suitable refuge habitat for threatened fauna. Therefore, coordination with other existing conservation programs, is very important to achieve cost-effective outcomes, minimise impacts to threatened fauna, and to keep all stakeholders engaged in implementing the control program over time.

d) **Implementation**

For maximum efficiency of time and funding, Blackberry can be treated at the same time as other priority bushy weeds such as Lantana (*Lantana camara*), African Boxthorn (*Lycium ferocissimum*), Boneseed (*Chrysanthemoides monilifera* subsp. *monilifera*) and Bitou Bush (*C. monilifera* subsp. *rotundata*).

e) **Monitoring**

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines such as the Blackberry control manual (NSW DPI).

f) **Procedures**

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Boneseed and Bitou Bush (*Chrysanthemoides monilifera sub monilifera* and *rotundata*)



Boneseed. Photo credit: Tony Rebelo (CC BY-SA)

Status: Eradicate

a) Background

Boneseed

Introduced as an ornamental garden plant, Boneseed was considered naturalized by 1910 and forms dense stands in bushland up to three metres tall. Growth occurs during winter and seeds germinate all year, peaking in Autumn. Plants can produce 50,000 seeds/year with approximately 60% viability and can remain dormant in the soil for up to 10 years. Boneseed is an environmental weed that can outcompete native vegetation and reduce habitat and food for native animals, threatening endangered ecological communities. Spread occurs primarily via birds, water, machinery, contaminated landscaping supplies and garden waste.

Boneseed is a WoNS, and the Biosecurity (Boneseed) Control Order 2017 established a control zone with the objective of species eradication. Measures must be implemented to prevent, eliminate, minimise or manage a biosecurity risk and impact of the species. In the control zone, any new infestations must be destroyed immediately, and the local control authority notified. Council is responsible for assisting with identification and management information for this species as inappropriate control activities can cause further spread of the infestation. The recognized strategic response for the region is the detailed surveillance, mapping and destruction of all infestations where practical. Management must be in accordance with the NSW Weed Incursion Plan and appropriate quarantine and hygiene protocols should be implemented. High level analysis of pathways identifying

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

areas of potential introduction, prevention options and monitoring of eradication process to be conducted.

Bitou Bush

Bitou Bush is a South African invasive shrub, commonly planted on the NSW Coast from 1946 – 1968 by the NSW Soil Conservation Service to stabilise coastal sand drifts and revegetate dunes post sandmining (Winkler et al 2008). Bitou Brush poses threats to native species and ecological communities and has subsequently under been listed as a noxious weed and Key Threatening Process under the NSW BC Act 2016. The species is widely distributed making eradication unlikely. Bitou Bush is WoNS and State priority weed for NSW with the objective of species containment and protection of key environmental assets. Broad scale elimination is not practicable; however, minimisation of the biosecurity risk posed by this species requires containment and removal where it is reasonably practicable. A Biosecurity Zone (Part 5, Division 3, Biosecurity Regulation 2017) for strategic management of the species has been established for all land in the state further than 10km of the Pacific Ocean mean high water mark between Cape Byron (North) and Point Perpendicular (South). The Liverpool LGA is in the Bitou Bush Biosecurity Zone and land managers are to eradicate the weed where feasible, and otherwise destroy as much of it is practicable. Spread of the weed should be suppressed and where it is part of a new infestation, the local control authority (Council) must be notified.

Additionally, under the Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): a person must not move, import into the State or sell Bitou Bush. The recognized strategic response for the region is to manage the species in accordance with the NSW Bitou Bush Threat Abatement Plan and Saving our Species. As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

Presence of Boneseed and Bitou Bush is known to Council on the Eastern side of Liverpool LGA on sandy soils. An isolated infestation is also known in Bringelly. Council's management of these species at present is reactive. Surveillance and control activities are being conducted. Council's approach is to manage in line with biosecurity and regional priorities of eradication. Within the Greater Sydney region, both subspecies are considered naturalized over extensive areas.

c) Control Options

Effective control of these species should take an integrated approach using a combination of management techniques listed below. Manual removal and chemical controls are the best suited options for natural areas. The Bitou Bush Management Manual (Winkler et al, 2008) and Boneseed Management Manual (Brigham et al, 2008) provide further comprehensive details for control options.

i) Physical

Both plants can be removed physically. Seedlings and single plants can be removed manually, ensuring that the entire root system is removed. For Boneseed, plants should be disposed of by bagging the seed or fire when fruiting. Slashing can be used for mature plants and is suitable before plants have fruited or flowered to prevent seed dispersal.

Follow up controls such as immediate application of herbicides to the stem are required to prevent regrowth. However, these techniques are time consuming and impractical for areas that are extensive or where access is difficult

ii) Chemical



A range of chemical controls are available to manage Boneseed and Bitou Bush. The NSW Weed Control Handbook and NSW Weedwise provide up-to-date details for suitable registered herbicides and permit requirements. All herbicides should be applied in accordance with their directions, dosage, and the best application methods. Appropriate permits for herbicide usage should be sought, particularly if spraying near waterways.

Bitou Bush should be treated in winter with the plant is actively growing and peak flowering. There are six herbicide application methods permitted for use including cut-and-paint, stem injection scrape-and-paint, foliar spraying, aerial boom spraying and aerial spot spraying. Low and targeted application rates should be used to minimize impacts for non-target species

Preferred methods for chemically controlling Boneseed are cutting-and-swabbing and stem injection rather than foliar spraying as this reduces the impacts for non-target species including native ground cover plants. Foliar spraying can be more efficient for initial treatment, however, follow up controls may be more laborious if more weeds have colonized the resultant bare ground.

iii) Fire

Fire can effectively kill both Boneseed and Bitou Bush and is useful for reducing large numbers of plants. It can also destroy seed in the topsoil and litter. Initial burns should be followed up with additional controls as fire can stimulate germination of seeds from lower in the soil profile. Fire intensity impacts the effectiveness, so consideration of fuel load, season and fire history are pivotal. Permits from the relevant State fire authority and landholder permission are generally required.

iv) Biological

For Bitou Bush, two insects have been released in Australia as biological controls which are effectively reducing seed production. The Bitou Tip Moth (*Comostolopsis germana*) destroys the growing tips, and the Bitou Seed Fly (*Mesoclanis polana*) destroys developing seeds are both well-established along most Bitou Bush distribution. There are other biological controls being studied for their effectiveness as use to control Bitou Bush. There is no current biological agent for Boneseed

v) Grazing

Grazing of Bitou Bush and Boneseed can reduce its presence; however, this is not practical on public lands as livestock can pose case other issues such as erosion, fouling of areas from dung, browsing desirable native species and spreading undesirable weeds. Boneseed shouldn't be grazed if in fruit and if livestock do eat fruiting plants they should be monitored in a holding paddock to ensure the weed is not spread to new areas.

vi) Challenges

There can be additional challenges with fire as control techniques such as increased potential for weed invasion, erosion, pest animal traffic and human access. Mechanical controls can also lead to erosion problems and soil disturbance due to the removal of large roots.

Control methods can potentially have negative impacts on some native habitats. Management strategies must minimise disturbance to soil and desirable vegetation and encourage native plant regeneration, treating the target species at a rate which allows for these restoration processes. Clearing dense infestations can encourage other weeds to spread rapidly by reducing competition for light, water, nutrients and space. Before removing Boneseed and Bitou Bush, an assessment of, and management of other present weed species should be conducted to prevent expansions of these populations.

d) Implementation

A long-term control program should be established with scheduled control and follow-up activities at the time of year they will be most effective. Management approaches should be integrated and aim



to reduce seed production and spread by dispersal vectors. Whilst mechanical and chemical techniques are effective, they can be laborious and costly, so implementation should be coordinated with other species with similar control options. It is beneficial to select herbicides that can treat multiple weed species simultaneously.

e) Monitoring

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines such as the Bitou Bush Threat Abatement Plan and Saving Our Species.

f) Procedures

Proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Cat's Claw Creeper (*Dolichandra unguis-cati*)



Cat's Claw Creeper. Photo credit: Royce Holtkamp

Status: Asset Based Protection

a) Background

Cat's claw creeper is an invasive, woody vine with yellow flowers and is a WoNS. Cat's claw creeper:

- forms dense mats that smother and outcompete native ground covers and seedlings
- climbs over shrubs and trees restricting growth or killing them
- can cause branches and whole trees to fall from the weight of the vines
- changes water flow when trees fall into waterways
- can create gaps in the canopy changing conditions for forest plants
- reduces food and shelter for native animals
- can damage infrastructure such as fences and sheds.

Cat's claw creeper is listed as a Key Threatening Process in NSW because of its potential to impact on endangered and vulnerable plants as well as Lowland Subtropical Rainforest, which is an Endangered Ecological Community.

Cat's claw creeper grows in coastal areas of NSW north of Sydney. Cat's claw creeper grows in subtropical, tropical and warm moist temperate climates. It can tolerate both heavy shade and full sun. It grows in a range of soil types but does not tolerate waterlogging. Plants can tolerate heavy frosts, drought conditions and saline soils. It grows:

- in rainforests, eucalypt forests and woodlands
- along waterways in coastal and hinterland areas
- in disturbed areas such as roadsides and occasionally gardens.



Seed pods mature in late summer to autumn and seeds start dropping from the vines in late May. Most seeds fall in July and August. Seed viability is low but seed production is high and some seeds produce multiple seedlings. The seeds germinate best when covered by moist leaf litter rather than buried in soil. The winged seeds can be blown in the wind and spread by water along streams and rivers. Established plants can reproduce from tubers and stems. Roots develop tubers in their second year. Detached tubers and stems sprout in moist conditions. The tubers can be spread in flood waters or by machinery if the soil is disturbed.

b) Current Management

Asset protection as part of bush regeneration projects.

c) Control Options

Using a combination of control methods is usually more successful. The methods chosen should be adapted to each situation, size and growth stage of the plant, and level of infestation. Freeing mature native trees from the vine is a key first step if you are restoring areas of native bushland.

To manage cat's claw creeper:

- treat isolated plants or sparse populations in areas you want to protect first
- check for and treat regrowth from roots, tubers and stumps for at least 5 years
- avoid damage to native vegetation and other desirable plants
- encourage the recovery of native vegetation to complete with the weed.

i) Chemical control

The most common herbicides used include Glyphosate, Picloram, and Triclopyr. Herbicides can be applied by scrape and paint, stem injection or cut stump treatment, year-round, and by foliar spray whenever new growth is present. For spraying application of herbicides, where possible, when the vines have not grown too high, pull cat's claw creeper down from desirable plants as it may be difficult to spray the leaves of the vine without also spraying the host. Use hand-held equipment to spray regrowth, seedlings and stems with foliage that is less than 2 m tall. This will minimise spray drift and off-target damage. Stems of the plant without leaves will not absorb herbicide. Spot spraying is often used as a follow-up control. For scrape and paint application, Cut stems about 50 cm from where they emerge from the ground and leave the upper stems to die in place. Scrape a strip of bark off one side of the lower stems and apply herbicide within 15 seconds to the scrape. Use a dye in the herbicide mixture so you can see which stems have been treated. For stem injection, thick vines can be treated by drilling holes approximately 10 cm apart around the woody stem of the plant using a 10 cm drill bit. The holes are then filled with herbicide within 15 seconds. If large tubers can be found underground, these can also be drilled and injected with herbicide. Cut stump treatment is the best method for large plants. Cut the climbing stems first, at about 1–2 m above the ground to clear a work area. Leave the aerial parts to die. Re-cut all stems as close to the ground as possible. Cut and scrape the stumps of thicker stems. Apply each cut or scraped surface with herbicide within 15 seconds.

ii) Mechanical removal

Pull stems away from any trees or buildings they are using to climb up. Cut the stems so that there is a gap between the part of the plant that is growing in the ground and the upper part of the vine. It is not recommended to pull the climbing stems out of tree canopy, as this may damage desirable plants and can be dangerous if branches fall from the tree.

Upper parts of the vine that have been cut, will eventually die. If some of the upper parts of the vine continue to grow, check to make sure all of the stems have been cut. Seedlings and small plants have tubers that can be dug out. Removing the larger, tuberous root mass of older plants can cause excessive soil disturbance and may not be suitable in all conditions. Tubers should be removed from the site as they can resprout. Contact your local council for advice on disposal.

iii) *Biological Controls*

There are two biological control agents for cat's claw creeper in NSW:

- *Carvalhotingis visenda*, a leaf sucking tingid
- *Hedwigiella jureceki*, a jewel beetle.

Both of these species feed on the leaves. The jewel beetles feed up higher in the canopy than the tingid so it is useful to use both agents. The jewel beetle is still being reared and released in NSW.

iv) *Prevention of spread and Education*

Identify locations where cat's claw creeper occurs as isolated plants or sparse populations. Remove seedlings and treat isolated plants or clumps first and follow up. Cat's claw creeper can spread along rivers, particularly from seeds dispersed by floodwaters. Keep un-infested areas free of cat's claw creeper. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

v) *Challenges*

Dense infestations of cat's claw creeper are very difficult to control due to its numerous lianas, abundant seed and ability to resprout from the tubers, sometimes for years.

d) **Implementation**

For maximum efficiency of time and funding, and for maximum weed control effects, Asparagus Weeds can be treated at the same time as other priority invasive vines and scramblers. Mechanical control methods can be implemented anytime, although pre-flowering / fruiting is best. Herbicides application is most effective when plants are actively growing.

e) **Monitoring**

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines such as the Cat's Claw Creeper Weed Management Guide (NSW DPI).

f) **Procedures**

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Chilean Needle Grass (*Nassella neesiana*)



Chilean Needle Grass Photo Credit: Romi Galeota (CC BY 4.0)

Status: Asset Based Protection

a) Background

Chilean Needle Grass (CNG) is a serious pasture and environmental weed that poses substantial threat to agricultural enterprises, native vegetation and amenity areas. It is a perennial grass native to South America and is listed as a WoNS. In NSW, its known range extends from the Northern Tablelands, along the Great Diving Range to the Southern Tablelands. Reportings are limited in the Greater Sydney Region but have been recorded around Erskine Park, Camden and the Illawarra area, for the period 2017-2021. Known presence in Liverpool LGA is limited; however, proximity and connectivity to these areas with greater recordings is an important consideration.

CNG is highly invasive with vigorous growth and may compete with and displace native plant communities. It is particularly resilient to drought and heavy grazing. It establishes well on bare ground and is difficult to control due to the persistent seed bank it builds up in the soil. Spread occurs via seed and this includes normal (flowering) seeds and stem seeds that are concealed and enable the plant to reproduce if flowering has been prevented.

Studies show that seeds have very high viability (90%) and can remain viable in the soil for several years (Muyt 2001). Habitats where it can occur include bushland, pastures, grasslands, roadsides, disturbed areas (including trails), riparian systems, urban areas, recreation areas and parks (ALA, 2020). The seeds are sharp and pointed, and readily attach to machinery, clothing, and animal coats. Seed can also be dispersed by floodwater. Impacts include reduced biodiversity, livestock injuries (seed penetration to skin, eyes and fleece) and downgraded pasture. In urbanised areas (including amenity areas) CNG can also cause irritation to humans and domestic animals such as dogs due to seed penetration. Containment is necessary to prevent further spread and infestations around the state.

As a Weed of National Significance which is widely distributed in some parts of the state, its spread must be reduced to protect priority assets. Whilst broad scale elimination is not practicable, minimisation of the biosecurity risk posed by this weed is reasonably practicable. Land managers are to prevent spread from their land where feasible and reduce the impact on priority assets. Additionally, under the Mandatory Measure (*Division 8, Clause 33, Biosecurity Regulation 2017*): a person must not move, import into the State or sell Chilean Needle Grass. There is currently no specific strategic response for the region; however, general biosecurity duty applies.

As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

CNG is managed reactively in Liverpool LGA. Council's approach is to manage this in line with biosecurity and regional priorities and prevent its spread in plant and brush cutting machinery. CNG is difficult to control due to the persistent seed bank and so prevention of CNG spread is the objective. Other options include the use of herbicides, pasture management and crop rotation. It is imperative that CNG controls should focus on preventing the flowering of CNG seedlings.

c) Control Options

i) Chemical Control

Herbicides can be an effective measure for controlling CNG. These generally contain glyphosate (non-selective) or flupropanate (selective). A selective herbicide should be considered to minimize the impacts for non-target species which can compete with the CNG. Pasture species have varying tolerances to these herbicides and so may result in the suppression of desirable species. Application to heavy infestations should be regularly checked and controls followed up due to the likelihood of creating bare patches where more CNG will grow.

Where possible, spot rather than boom spraying is appropriate. Follow up controls and surveillance are critical for containment and longer-term eradication.

The NSW Weed Control Handbook and NSW Weedwise provides up-to-date details for suitable registered herbicides. All herbicides should be applied in accordance with their directions, dosage, and the best application methods. Appropriate permits for herbicide usage should be sought, particularly if spraying near waterways.

ii) Non-Chemical Control

For successful containment, the whole plant needs to be destroyed. Thus, physical removal of the needle grass is effective for small patches and singular plants. This method can be effective and leaves less bare soil than herbicide spot spraying.

Mower and brush cutting machinery may reduce seed set in the grass flower heads, but it will not remove the stem seeds. These methods are also likely to further distribute seeds. Appropriate consideration about undertaking these controls when the grass is not flowering and using mowers with catching attachments is recommended. It is important that the clippings are destroyed (i.e., burnt) and that any machinery used is thoroughly cleaned before being taken elsewhere.

Control may also be achieved by sowing dense crop or pasture to create competition and reduce the quantity of needle grass that can germinate. Maintaining healthy pasture and addressing patches that are thin and bare is an effective long-term strategy to prevent invasion.

iii) Biological Controls

There are no useful agents in Australia to biological control CNG.

iv) Prevention



To avoid invasion, minimize bare soil by seeding desired species and maintain healthy pasture. Vehicle and machinery hygiene should be ensured when moving into clean areas. This is a priority to prevent the spread of seeds with the potential to germinate. Machinery and vehicles should be washed down where appropriate. This requires the practice of good hygiene of boots, tyres, boating trailers, mowing equipment etc. to prevent accidental and intentional spread to un-infested land. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through stock, produce or transported equipment. Additionally, animal movement from infested areas should be controlled.

Early detection and remove plants before they seed. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

v) **Challenges**

The key challenges for controlling CNG are the prevention of seed spread due to high seed viability and seed banking in the soil. Early detection, follow up controls, ongoing surveillance and machinery/vehicle hygiene are crucial for containment. Chemical controls are useful for the removal of needle grass; however, risk leaving bare soil which creates an optimal environment for further seed germination. It may be necessary to use a combination of follow up controls to mitigate this.

d) **Implementation**

For maximum efficiency of time and funding, CNG should be identified and managed as early as possible, ideally before seeding occurs. Where the infestation is small, physical removal and/or spot spraying of singular plants is effective. Where the infestation is more substantial, it may be appropriate to treat CNG with other problematic exotic perennial grasses. All methods require early identification, follow up controls, monitoring.

e) **Monitoring**

Eradication in most core area infestations is generally not feasible. Long-term management strategies should aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines.

NSW DPI Biosecurity Information System- Weeds (2017-21) has recorded the presence of CNG during property inspections. This database resource can be used to identify and report infestations of CNG in the Liverpool LGA.

f) **Procedures**

Proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.

Public and Council staff education about the weed will increase awareness about the weed and aid early identification and reporting.



Coolatai Grass (*Hyparrhenia hirta*)

Coolatai Grass. Photo credit: Tony Rebelo (CC BY-SA 4.0)

Status: Eradicate

a) Background

Coolatai Grass is an invasive tussock forming perennial grass that is drought, fire, and herbicide resistant. It is a major threat to undisturbed natural ecosystems, native biodiversity, and pasture. The plant has a number of characteristics which enhance its ability invade relatively undisturbed ecosystems including that it is long lived, can produce seed from a single plant, has mobile seeds (wind, water, animals, and vehicles), can germinate in a wide range of temperature and that established plants are highly tolerant.

The grass has continued to expand across Australia and forecast increases in summer rainfall and milder winters due to climate change make this likely to continue spreading. Due to its impacts and risk for spread, it is identified as a Weed of Regional Concern by the Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022. As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

Council considers Coolatai Grass a priority for containment and undertakes proactive management. There is currently very limited known distribution in the Liverpool LGA; however, potential for spread is recognized.

c) Control Options

i) Physical Controls



Infestations often start with 1-2 plants and so when detected early, physical removal and disposal and be successful at limiting any spread. Plants should be removed as soon as they are identified and where possible before viable seed has been set. When removing the plant manually, avoid disturbing any seed in the process. The collected plant material should be bagged and burnt.

ii) Chemical Controls

This species is tolerant of most common herbicides making control challenging. Growth suppression with herbicide application can be achieved with timely and ongoing follow up after the initial knockdown. For all application methods, three repeats in the same growing season are required. Glyphosate, Flupropanate or a combination of the two can be used to target the grass with spot or blanket spraying.

Studies have also shown that herbicide pre-treatments including burning and slashing suppresses active growth of the grass and reduces control effectiveness. For the herbicides to be successful, there should be sufficient green leaf and active growth.

The NSW Weed Control Handbook and NSW Weedwise provides up-to-date details for suitable registered herbicides. All herbicides should be applied in accordance with their directions, dosage, and the best application methods. Appropriate permits for herbicide usage should be sought, particularly if spraying near waterways.

iii) Prevention

Early detection is critical to enable prompt control and prevent an infestation establishing. Rigorous hygiene protocols are necessary in areas with known infestation as the species spreads readily by seed, stock, machinery, and fodder. Of particular concern is the management of roadside areas. Coolatai Grass can very easily establish in optimum conditions created during road maintenance and construction (lighter textured soils, regular glyphosate application for vegetation control and road surface water harvesting). It is important to identify and map Coolatai Grass within roadside vegetation areas and prevent slashing until the species is eradicated. Slashing can increase seed spread and enable it to further establish and/or move into new areas. Where machinery is used in an infestation area, it should not be moved to another area without being properly cleaned.

To facilitate early detection, awareness about the species should be increased to better enable accurate identification.

iv) Challenges

Accurate identification is one of the greatest challenges with this species as it prevents early detection and management. Coolatai Grass that is not in flower can be difficult to accurately identify and there are a number of other exotic and summer growing native grasses than can be easily confused with it. It is unlikely that herbicide alone will control Coolatai Grass, and a combination of controls and follow up are necessary to control this weed.

d) Implementation

With effective management, Coolatai Grass can successfully be eradicated from an area in two to three years. Seed viability is only two years so when it is removed from an area and seedlings destroyed before seed set, as long as no further seed is introduced the area can be eradicated of Coolatai Grass.

e) Monitoring

Rigorous monitoring and eradication of existing infestations where feasible should be conducted. Current surveillance should be continued to prevent the development of new infestation. Roadside areas should be specifically monitored and mapped for the presence of Coolatai Grass.

f) Procedures



Proactive program with prevention strategies and annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance. This will become more crucial as climate changes due to global warming. Specifically, roadside area construction and maintenance management should account for machinery hygiene and slashing protocols that minimise the risk of Coolatai Grass spread.



Fireweed (*Senecio madagascariensis*)



Fireweed. Photo credit: H. Rose

Status: Asset Based Protection

a) Background

Fireweed looks like a daisy with little yellow flowers. Flowering is mostly from spring to autumn but times vary for different parts of NSW. All stages of the plant from seedlings to flowering may be present at any time of year in some locations. Flushes of seedlings appear after rain in warm weather. Fireweed invades pastures and disturbed areas and is a WoNS. It:

- reduces productivity
- is poisonous to livestock and can cause death
- is difficult to control.

Fireweed grows along the Australian east coast from Victoria to Central Queensland. It is most invasive in coastal regions. It is also on the northern and southern tablelands. It was first seen in the Hunter Valley in 1918. Fireweed thrives in:

- overgrazed pastures
- disturbed or cultivated soil
- most soil types.

Fireweed does not grow well in shaded areas or wet areas. It does not survive waterlogging.

b) Current Management

Reactive management, only managed on bush regeneration sites.



c) **Control Options**

Effective long-term control of fireweed needs to consider that:

- most new seedlings appear in autumn
- many new seedlings appear after rain when temperatures are 15–27°C
- seedlings grow fast and can flower 6–10 weeks after emerging
- flowering and seeding occur mostly in spring
- most plants die off by late spring
- some plants live for up to three years - the tops die back in spring and regrow the following autumn
- fireweed seed buried deeper than two centimetres is unlikely to germinate
- long-term follow up is essential because about 15% of seeds remain dormant for over 10 years.

In pastures, combine grazing strategies, pasture improvement and strategic herbicide use. In environmental areas hand-pull individual plants and spot spray herbicide.

i) *Chemical control*

Herbicides are most effective in combination with healthy, competitive pastures. The best time to treat fireweed with herbicide is late autumn. This controls the peak numbers of seedlings and young plants. By late winter herbicide treatments are much less effective. Used correctly, selective herbicides don't kill grasses but do slow their growth. They can kill legumes, which are important pasture plants. Blanket applications of selective herbicide are problematic because pasture growth is set back. Wherever possible limit the application areas in paddocks. Bromoxynil herbicides cause the least damage to legumes but only kill young fireweed plants. Protect legumes by applying only when the maximum daily air temperature will be below 20°C. Metsulfuron-methyl herbicides can kill older fireweed plants, but also kill pasture legumes. Flowering plants can be spot sprayed with herbicides containing aminopyralid or metsulfuron-methyl.

ii) *Mechanical removal*

Careful slashing or mulching can reduce fireweed seeding when done:

- before late spring
- when less than 25% of plants are flowering
- at least every six weeks if pastures can recover faster than the cut fireweed plants

Wait two weeks before grazing slashed areas. Livestock are more likely to eat the cut, wilted fireweed. Avoid slashing or mulching in late spring, or when more than 25% of plants are flowering. This can trigger plants to regrow, surviving into summer rather than dying off at the end of spring. That makes next season's control harder.

iii) *Pasture Management*

Maintaining healthy pastures is the best long-term defence against fireweed. Have good autumn–winter pasture cover to suppress new fireweed plants. Avoid grazing too hard. Weeds like fireweed then establish in thin and bare patches. To maintain healthy pasture cover:

- grow combinations of winter and summer pastures
- rest pastures between grazing periods
- test soil to check fertility
- use fertiliser if needed.



Large patches of bare ground and lots of weeds are signs of poor pastures. Pasture improvement to control fireweed is proven to work best north of Sydney where there's more rain in summer). South of Sydney it rains more in winter and pastures are slower to establish. Selective herbicides may be needed to control fireweed until pastures mature. Pasture improvement aims to:

- sow vigorous pasture plants that compete with fireweed
- cover bare soil
- correct soil fertility problems

and adjust grazing to:

- always keep at least 90% of the ground covered with good pasture plants
- have even higher cover during peak fireweed germination in autumn
- reduce numbers of grazing animals before overgrazing.

iv) *Biological Controls*

There are no effective biological control agents available for fireweed. It is difficult to find a biological control that is harmless to the native *Senecio* species. These insects can attack and sometimes destroy fireweed plants:

- A chrysomelid beetle (*Chalcolampra* spp.)
- A magpie moth (*Nyctemera amica*)
- A blue stem borer moth (*Patagoniodes farinaria*).

These species cannot be relied on for control. The damage usually occurs after the plants have produced seeds.

v) *Prevention of spread and Education*

The rapid spread of Fireweed along the east coast of Australia in the last 90 years is a clear indication of its invasive potential. The aim is to restrict seedling emergence, control seedlings early, and prevent seed set and seed spread. To avoid invasion, minimize bare soil by seeding desired species and maintain healthy pasture. Vehicle and machinery hygiene should be ensured when moving into clean areas. This is a priority to prevent the spread of seeds with the potential to germinate. Machinery and vehicles should be washed down where appropriate. This requires the practice of good hygiene of boots, tyres, mowing equipment etc to prevent accidental and intentional spread to un-infested regions. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through stock, produce or transported equipment. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

vi) *Challenges*

Fireweed is able to germinate between 15°C and 27°C (at the soil surface), and so is able to germinate, grow and reproduce throughout most of the year in most climates in NSW. Due to it being poisonous to livestock, it cannot be contained effectively through grazing.

d) **Implementation**

For maximum efficiency of time and funding, Fireweed should be identified and managed as early as possible, ideally before seeding occurs. Where the infestation is small, physical removal and/or spot spraying of singular plants is effective. All methods require early identification, follow up controls, monitoring.



e) Monitoring

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines.

f) Procedures

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance. Public and Council staff education about the weed will increase awareness about the weed and aid early identification and reporting.



Frogbit (*Limnobium spp*)



American frogbit. Photo credit: Sam Kieschnick (CC BY 4.0)

Status: Eradicate

a) Background

Frogbit is a fast growing perennial, floating freshwater weed. It predominately grows in freshwater waterbodies but can also tolerate slightly saline conditions. The weed forms dense mats over the water's surface which prevents growth of native water plants. This reduces lights, food, and habitat for associated aquatic fauna. The weed also has negative impacts for recreational activities including fishing, swimming, and boating. In NSW, spread has primarily occurred by the illegal dumping of aquarium and pond plants in waterways. Frogbit can spread by seed and plant parts. Typical, distribution occurs by water flow and currents, birds and attaching to watercraft

Prevention of the biosecurity risk associated with Frogbit is a reasonably practical objective as it has a very limited distribution in the State and poses substantial biosecurity risk. Under the Prohibited Matter (Part 4, Biosecurity Act): a person who deals with any biosecurity matter that is Prohibited throughout the state is guilty of a state offence. The recognized regional strategic response is that this species be managed in accordance with the New Weed Incursion Plan.

As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

Council considers eradication and active surveillance for new incursions of Frogbit a priority. There is currently very limited distribution of the species in Liverpool LGA and council undertakes proactive management with routine monitoring and reporting.

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

c) Control Options

Frogbit is a prohibited matter, and any sightings should be reported to NSW DPI Biosecurity who are responsible for the initial treatment and disposal of this plant. A variety of chemical control options are available to successfully eradicate this weed; however, this should be undertaken in consultation with NSW DPI.

All herbicides should be applied in accordance with their directions and NSW Weed Wise should be used for up-to-date information on registered herbicides, dosage and the best application methods. Appropriate permits for herbicide usage should be sought, particularly if spraying near waterways.

d) Implementation

Proactive prevention and surveillance of new incursions should continue. If the weed is reported in the LGA, it should be rapidly destroyed with ongoing follow up. Hygiene and disposal strategies should ensure that the plant can't reproduce.

e) Monitoring

Proactive controls, monitoring and surveillance should be a Council priority. Education and awareness activities of the regional importance should be pursued to increase knowledge for relevant stakeholders including land managers, private landholders, and the public.

f) Procedures

Proactive program with prevention strategies, rigorous surveillance and reporting.



Kei Apple (*Dovyalis caffra*)



Kei apple. Photo credit: Jeremy Gilmore (CC BY 4.0)

Status: Eradicate

a) Background

Kei Apple is a small thorny tree that tolerates frost, drought, and saline soils. It can be found in bushland around Western Sydney. The sharp thorns can be a safety hazard and dense foliage out competes and shades native plants. Spread occurs easily by seeds which are distributed by birds who eat the tree's apricot-like fruit. New plants are often found growing under trees or other locations where birds perch.

Kei Apple has been classified as a regional priority weed in Greater Sydney with the objective of eradication. Species presence in the region is limited in abundance and distribution and elimination of the biosecurity risk it poses is reasonably practical. General biosecurity duty for the species in Liverpool LGA is that land managers eradicate and keep their land free from Kei Apple and notify the local control authority (Council) if they identify it on their land. Additionally, the plant (inclusive of all its parts) cannot be grown, traded, carried, or released into the environment. The recognized strategic response for the region is the detailed surveillance, mapping, and destruction of all infestations where practical. Appropriate quarantine and hygiene protocols should be implemented and management in accordance with the NSW Weed Incursion Plan.

As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management



Currently Council is undertaking management of Kei Apple in Liverpool LGA in line with biosecurity and regional priorities of eradication. Infestations are known to Council in Austral and Kemps Creek; however, generally distribution is limited within the Liverpool LGA. Substantial efforts have been made to remove this species with proactive management.

c) Control Options

i) Chemical Options

A range of herbicides are available to successfully control Kei Apple including Fluroxpyr and Glyphosate. These can be applied using basal bark and stem injection techniques, respectively. This can be expensive and time consuming so application should be targeted. All herbicides should be applied in accordance with their directions. NSW Weed Wise should be used for up-to-date information on registered herbicides, dosage, and the best application methods. Appropriate permits for herbicide usage should be sought, particularly if spraying near waterways.

d) Implementation

Eradication and monitoring of existing Kei Apple infestations in Liverpool LGA should include targeted chemical control and follow up. Council should also undertake proactive controls and surveillance to prevent spread. Education and awareness activities of the regional importance should be pursued to increase knowledge for relevant stakeholders including land managers, private landholders, and the public.

e) Monitoring

Eradication is considered feasible and ongoing monitoring, surveillance and mapping should be incorporated within management plans in line with best practice guidelines.

f) Procedures

Proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Lantana (Lantana camara)

Lantana. Photo credit: A. Johnson

Status: Asset Based Protection

a) Background

Lantana is a scrambling shrub with colourful flowers. It is a widespread weed in coastal areas and is a WoNS. Lantana:

- is poisonous to animals and humans
- invades native grassland and pastures
- invades eucalyptus and pine plantations
- fuels bushfires
- can restrict access to bushland and waterways
- costs land managers more than \$22 million each year to control.

Lantana provides some shelter for native fauna. All types and parts of lantana are considered poisonous to humans and stock.

Lantana's range extends from Bega Shire in southern NSW to Cape Melville in north Queensland. It is present on Lord Howe and Norfolk Islands. The main infestations are east of the Great Dividing Range in NSW and QLD. Lantana is unlikely to invade new regions in NSW. It is increasing in density and invades new areas within its range. Lantana was introduced to Australia in 1841 as an ornamental plant. By the 1860s it was common in Sydney and Brisbane. Lantana can quickly colonise roadsides, power line and railway easements, river banks, fence-lines, forestry, pastures, open native woodlands and subtropical rainforest edges. Lantana can grow in steep, inaccessible areas. Lantana often invades disturbed areas where vegetation has been cleared. It's less likely to grow in undisturbed bushland.

Lantana prefers:

Liverpool City Council



- warm weather with more than 900 mm annual rainfall
- well-drained, fertile soils
- coastal areas
- altitudes up to 1000 m.

Lantana can survive periods of drought. It tolerates poor soils and sand and will grow on stony hillsides if moisture is available. Lantana is slowed by:

- cold weather (it stops growing when temperatures are below 5°C)
- low light
- some soils (waterlogged conditions, heavy clays, salt-affected).

A single Lantana plant can produce up to 12,000 fruit (and seeds) in a year. Most seeds are spread by birds and some animals that eat the fruit. Lantana seed is more likely to germinate if it has been through the gut of a bird or mammal. Seeds are also spread by water, in soil, on machinery and garden waste. About half of seeds remain viable for up to two years in dry conditions and some may survive for five years. Lantana regrows after cutting back, even if cut to the base. Cut stems grow new roots when they contact damp soil.

b) Current Management

Reactive management, only managed on bush regeneration sites.

c) Control Options

For successful control of Lantana, a combination of methods is usually needed, including:

- gradual control of sections of large infestations, starting at the edges (do as much at a time as you can follow up)
- dry or frosty periods are good times to work on mature lantana plants
- treat regrowth or seedlings before they are 1 m high
- control young plants before they are a year old to prevent new fruit and seeds
- in summer, look for a flush of seedlings after rain, and kill the seedlings 1 – 3 after the rain event (lantana seeds can germinate year-round but peak after summer rain).
- 1 – 3 months after clearing, burning or cultivation, look for regrowth or new seedlings and control them.
- 3 – 6 months after the end of a dry spell, look for dry lantana that appeared dead reshooting from the base, and control the regrowth
- in spring, look for plants that reshoot after frost damage, and control the survivors.

i) Chemical control

Control with herbicides can be a practical, effective and efficient method of lantana management. They are cost effective for smaller infestations and for treating regrowth.

Pink flowered lantana is easier to control with herbicide than red flowered varieties. Many herbicides are available for Lantana chemical control. The aim should be to minimise off-target damage to native species and pasture grasses. Foliar spraying is only effective if the lantana is actively growing and the plants are less than two metres high. mature lantana is best treated with foliar spraying between February and the first frost. Active regrowth from dry or frost affected lantana is ideal for treatment with foliar spraying as access to the regrowth foliage is easier and the reduced plant surface area requires less herbicide. Regrowth from burning, cutting, slashing or frost is best treated when it reaches a height of 30 cm to 1 m.



Splatter-guns use small amounts of highly concentrated herbicide. A five-litre bottle of mixed herbicide should cover about 0.2 hectares of lantana. The splatter gun:

- works best on dense infestations at least 300 mm high
- limits off-target plant damage
- is good for hard-to-access and steep areas
- can be used year round if plants are actively growing, but works best during summer
- is cheaper than traditional foliar spray methods.

Spray during cooler periods of the day. Angle the gun at 45 degrees and spray an arc over the top of the plant and down the front face. Apply two squirt lines per half a metre of plant height. The amount to apply will depend on the herbicide concentration. Do not spray until herbicide runs off. Do not use the splatter-gun:

- in wet weather
- when there is water or dew on the plants
- on spindly lantana regrowth.

Basal barking can be effective on plants that have been defoliated by biological control agents and is effective at any time of year. Mix the herbicide with diesel. Apply around all stems from the ground up to 30 cm high by spraying at low-pressure or painting on with a brush. For the cut-stem method, cut stems off at about 15 cm from the ground. Apply herbicide to the cut surface of the stump within 15 seconds. It is important to treat every cut stem because lantana regrows vigorously from untreated stems.

ii) *Mechanical removal*

Control with mechanical methods can be suitable for extensive mature lantana infestations. mechanical control by bulldozing or slashing plants can be successful for removing large mature bushes quickly. mechanical control needs to be followed up by herbicide control of seedlings and replacing the lantana with pasture or other vegetation cover. Follow-up spot spraying or further mechanical control is therefore essential until the preferred desirable species becomes dominant. In environmentally sensitive areas, a staged approach should be adopted. Ensure native species are planted where Lantana has been removed.

iii) *Biological Controls*

Successful biological control of lantana has proven difficult. This is mainly due to the number of lantana varieties and the wide range of habitats that it invades. Of the 31 biological control agents which have been introduced into Australia to help control lantana, 17 have become established and four of these are effectively reducing the vigour and competitiveness of lantana in certain areas. Biological control alone cannot eradicate lantana but may help to contain infestations and reduce their spread in the long term.

The lantana rust (*Prospodium tuberculatum*) is a fungal pathogen that was introduced from Brazil in 2001. This rust attacks the widespread pink flowering variety of lantana and appears to have a wide tolerance of climatic conditions.

The two insects causing the most damage are the leaf-mining beetles *Uroplata girardi* and *Octotoma scabripennis*. Larvae of both these insects mine leaves of all lantana types, thereby suppressing plant growth and causing a reduction in flowering. Another insect that can damage the plant is the leafsucking bug, *Teleonemia scrupulosa*. The fourth insect that affects their growth is the lantana seed fly, *Ophiomyia lantanae*. Adults of this insect feed on the flowers while the larvae feed on the developing fruits and seeds.



iv) Prevention of spread and Education

This requires the practice of good hygiene of boots, tyres, mowing equipment etc to prevent accidental and intentional spread to un-infested regions. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through stock, produce or transported equipment. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

v) Challenges

Control of Lantana usually requires follow up after initial efforts to control regrowth and new seedling growth. Large, dense infestations can be costly to treat with chemicals and are difficult to access. Reinfestation can occur unless removed plants are replaced with natives.

d) Implementation

For maximum efficiency of time and funding, Lantana can be treated at the same time as other priority bushy weeds such as African Boxthorn (*Lycium ferocissimum*), blackberry (*Rubus fruticosus* agg.), Boneseed (*Chrysanthemoides monilifera* subsp. *monilifera*) and Bitou Bush (*C. monilifera* subsp. *rotundata*).

e) Monitoring

Lantana is an extremely hardy and persistent weed. Follow up control is always required to prevent reinfestation by regrowth or new seedlings. Control work should be prioritised in situations where there will be enough resources to allow ongoing control in the following months or years. Removing lantana can be a waste of time unless follow up management is carried out.. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines.

f) Procedures

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Ludwigia (Ludwigia peruviana)

Ludwigia. Photo credit: Donna Fernstrom (CC0 1.0)

Status: Contain

a) Background

Ludwigia is an opportunistic and rapid growing water weed threatening wetlands and riverine habitat. In a short timeframe, it can dominate all aquatic vegetation and choke waterways and is a threat to many endangered freshwater wetlands in the Sydney bioregion. It develops as a dense canopy on the waterbody that reduces light and water temperature. This negatively affects native aquatic flora and fauna communities. It reproduces both by seed and vegetatively from root plant fragments and seedlings anchor into the soil with a large taproot. The plants produce thousands of sticky seeds that can spread by attaching to machinery clothing, feathers and hair. Water flow and flood waters can also distribute plant fragments and seeds downstream. Seeds have very high viability (80%) and can germinate quickly in shallow water, mud or floating on the mats of *Ludwigia* vegetation.

Ludwigia has been classified as a regional priority weed in Greater Sydney with the objective of asset protection for the species. The species is listed as a WoNS and poses risk to the environment, agriculture, and community amenity. In the region, broad scale elimination is not practicable; however, minimisation of the biosecurity risk posed by this species requires containment and removal where it is reasonably practicable. General biosecurity duty for the species in Liverpool LGA is that land managers should mitigate risks of species introduction to their land, prevent its spread, minimize the impacts on priority assets and notify the local control authority (Council) if the plant is identified on their land. Additionally, the plant (inclusive of all its parts) cannot be grown, traded, carried, or released into the environment. The recognized strategic response for the region is for ongoing suppression and removal of the plant, and identification of priority assets identified for targeted management.

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

Ludwigia occurs on numerous Council waterbodies in the Liverpool LGA. Council considers containing the current extent of the species as a priority and undertakes proactive management.

c) Control Options

Ludwigia is best controlled when the seedlings are targeted within the first 18 months of growth and before flowering due to the extensive soil seed bank that develops after this.

i) Physical Control

Where Ludwigia plants or infestations are small, manual removal can be effective. Where infestations are larger, slashing and burning can be used. Care should be taken to remove as much of the root as possible and to prevent further spread of the seeds. Management should be combined with followed up with herbicide application

ii) Chemical Control

Herbicide control of Ludwigia is most successful when conducted whilst it is actively growing and before flowering. A range of effective, registered herbicides are available that can be applied using foliar spray or cut stump methods. When applying herbicides in aquatic environments, runoff or spray into the catchment should be prevented to avoid impacts to non-target species. Permits are required if using a 2,4-D amine herbicide.

All herbicides should be applied in accordance with their directions. NSW Weed Wise should be used for up-to-date information on registered herbicides, dosage and the best application methods. Appropriate permits for herbicide usage should be sought, particularly if spraying near waterways.

d) Implementation

Continue proactive management of the weed on Council waterbodies. For maximum efficiency of time and funding, Ludwigia in waterways should be targeted in the active growth phase and before flowering, ideally within the first 18 months of growth. Where possible, management should be coordinated with other aquatic weeds or controls for Ludwigia in the catchment and neighbouring LGAs.

e) Monitoring

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact to priority assets by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines.

f) Procedures

Proactive program with prevention strategies and annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Madeira Vine (Anredera cordifolia)

Madeira Vine. Photo credit: Sam Kieschnick (CC BY 4.0)

Status: Asset Based Protection

a) Background

Madeira vine is an invasive climbing vine with fleshy heart-shaped leaves and aerial tubers. It is a WoNS. Madeira vine grows very quickly and it can:

- smother and kill plants from ground covers to tall trees
- cause branches and trees to fall due to the weight of the aerial tubers
- reduce food and habitat for native animals
- invade crops such as sugarcane
- cause ill health if eaten by livestock.

Madeira vine is one of the invasive vines listed as a Key Threatening Process in NSW. It threatens three endangered species of plants and three Endangered Ecological Communities.

Madeira vine mostly grows in coastal areas of NSW with summer rainfall. However, it is spreading into dryer inland areas including the North West and Central West of NSW. Madeira vine grows in sub-tropical and warm temperate areas. It grows best in full sun or partial shade but is also tolerant of dense shade. It often establishes on the margins of rainforests and on the edges of waterways. It is partly salt-tolerant and can grow over mangroves.

b) Current Management

Reactive management, only managed on bush regeneration sites.

c) Control Options

Using a combination of control methods is usually more successful for Madeira Vine control. This includes follow-up after initial efforts, and detecting and killing regrowth or new plants. To manage madeira vine effectively:

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

- treat isolated plants or sparse populations in areas you want to protect first
- check for and treat regrowth from tubers and stems
- avoid damage to native vegetation and other desirable plants
- encourage the recovery of native vegetation to compete with the weed.

i) *Chemical control*

The most common herbicides used to control Madeira Vine include Glyphosate, Picloram, and Triclopyr, and Fluroxypyr. Using herbicides in warmer months will give the best results. Though, a herbicide application during late winter may allow easier access and better control during the following spring and summer months.

Spraying is suitable for seedlings and for plants growing along the ground, over structures or over other non-desirable plants. Apply herbicide to all foliage to the point of visible wetness. If plants do not have tubers and are climbing on desirable plants, pull them off gently and spray them on the ground. Foliar spraying may be used after the stems have been treated using scrape and paint techniques. It can also be used as an initial treatment, followed by scrape and paint of remaining living stems. Follow up by spraying sprouting tubers when they have between 2 and 8 leaves.

Splatter guns can be used for dense infestations of madeira vine that are difficult to reach. The specialised nozzle produces large droplets. This allows plants up to 10 m away to be sprayed with limited chance of spray drift. Spray small amounts of concentrated herbicide on the weed, taking care not to spray the leaves of native or other desirable plants. It is not necessary to cover all of the foliage.

Stem scraping is suitable for vines of any size and for those with aerial tubers. It is the safest management option in sensitive environments. It is labour intensive, as every vine stem has to be treated individually. Scrape sections of the vine down to the white fibrous layer and paint the exposed area with concentrated herbicide within 15 seconds. Repeat the process as high up the stem as possible. If possible, scrape both sides of the stem. Do not ringbark the stem as this will prevent the herbicide spreading through the plant. Remove and collect tubers along the stem near where they are to be scraped as they can easily fall off when the vines are being treated.

The cut stump method can be used for young vines without aerial tubers. It should only be used on vines with aerial tubers if it is possible to follow up the initial control by treating all of the sprouting tubers that fall to the ground. Tubers may continue to sprout for several years. Cut stems and apply herbicide to the part of the vine that is attached to the ground and the vines remaining above within 15 seconds of cutting.

ii) *Mechanical removal*

Madeira Vine can be physically removed by hand for smaller or immature infestation sites by digging up tubers and collect all plant parts. Dispose of tubers, leaves and stems, as they will regrow when in contact with the soil or if they are exposed to any sunlight. If there is stress on the host plants, cut and pull the madeira vines from the canopy. When pulling the vines aerial tubers easily fall off the stems. Lay tarps or cloths on the ground to collect the aerial tubers to prevent the infestation from spreading. Cut vines can survive in the tree canopy and continue to drop tubers for up to two years. It is important to remove as much plant material as possible.

iii) *Biological Controls*

The leaf-feeding beetle *Plectonycha correntina* has been released in NSW and Queensland. The beetle has established and caused significant damage to madeira vine at many of the release sites. Both the adult beetles and the larvae feed on the leaves. Leaf-feeding reduces the plant's ability to photosynthesise



and depletes the energy stores in the tubers. Only use the beetles in flood-free and frost-free areas. To allow the beetles to establish, do not use other control methods on the release sites.

iv) Prevention of spread and Education

This requires the practice of good hygiene of boots, tyres, mowing equipment etc to prevent accidental and intentional spread to un-infested regions. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through transported equipment. Remove any madeira vine in gardens and dispose of all plant parts appropriately. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

v) Challenges

As Madeira Vine grows from tubers, stems or leaves, its control is challenging. Regrowth can occur from all of these plant parts. Therefore, control of Madeira Vine usually requires follow up after initial efforts to control regrowth. Large infestations can be costly to treat with chemicals. Reinfestation can occur unless removed plants are replaced with natives.

d) Implementation

For maximum efficiency of time and funding, Madeira Vine can be treated at the same time as other priority invasive vines and scramblers .

e) Monitoring

Monitoring should be one of the first activities implemented at a control site. It will provide a benchmark to assess the progress at the site. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines.

f) Procedures

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Prickly Pears - Opuntias (*Opuntia* spp.)



Smooth Tree Pear. Photo credit: Paul Marynissen (Central Coast Council)

Status: Asset Based Protection

a) Background

There are 11 weed species of Prickly Pears – Opuntias (*Opuntia* species) occurring in Australia, including Aaron’s Beard Prickly Pear (*O. leucotricha*), Blind Cactus (*O. rufida*), Bunny Ears Cactus (*O. microdasys*), Chicken Dance Cactus (*O. schickendantzii*), Common Pear (*O. stricta*), Indian Fig (*O. ficus-indica*), Riverina Pear (*O. elata*), Smooth Tree Pear (*O. monacantha*), Tiger Pear (*O. aurantiaca*; see: ‘Tiger Pear’ profile below), Velvety Tree Pear (*O. tomentosa*), and Wheel Cactus (*O. robusta*). Opuntias are cactus plants that can invade natural areas and pastures. Opuntias were first introduced into Australia with the first fleet, via Brazil, to establish a cochineal dye industry. By 1920 *Opuntia stricta* had infested 23,000,000 hectares in NSW and Queensland. Half of the infested area was so densely covered it was useless for production and was abandoned by its owners. Opuntias have been declared WoNS in Australia.

Aaron's Beard Prickly Pear

Aaron's Beard Prickly Pear. Photo credit: Courtesy of Queensland Department of Agriculture and Fisheries

Aaron's Beard Prickly Pear is a branched, succulent cactus that grows up to 2.5 m tall and often has a trunk. It has large succulent pads covered in white spines. Aaron's beard prickly pear can outcompete native plants, reducing food and habitat for native animals. It has sharp spines up to 5 cm long that:

- cause painful injuries to people, livestock, working dogs and pets
- injure and sometimes kill wildlife that get trapped in the spines
- devalue wool and hides and prevent shearing
- get stuck around the mouth of lambs or calves and prevent them from feeding.

It also forms dense thickets that prevent movement of animals and people. This means that:

- livestock may not be able to access feed
- mustering is difficult
- access to watering points is reduced
- recreational activities such as bushwalking and camping are restricted.

In NSW, there are infestations of Aaron's Beard Prickly Pear in the North West region. This cactus grows in arid, semi-arid and warm temperate climates. It grows best on well drained soils.

New plants can grow from parts of the stem of Aaron's Beard Prickly Pear when they come in contact with the soil. These plant parts can be spread by water, sticking to animals or vehicles and by people dumping garden waste. Aaron's Beard Prickly Pear is not known to produce seeds in Australia.

Blind Cactus*Blind Cactus. Photo credit: Courtesy of Queensland Department of Agriculture and Fisheries*

Blind Cactus is a spineless cactus with pairs of pads which are covered in tufts of reddish-brown bristles. Blind cactus forms dense thickets and:

- outcompetes native plants
- limits movement of animals and people
- competes with pasture plants reducing productivity
- has barbed bristles which can injure people and animals
- can restrict recreational activities such as bushwalking and camping.

In NSW, there are infestations in the North West region. Blind Cactus has mostly been spread by people growing it as an ornamental plant. New plants can grow from parts of the pads or fruit when they come in contact with the soil. These plant parts can be spread by:

- water
- sticking to animals or vehicles
- people dumping garden waste.

Blind cactus is not known to produce seeds in Australia.

Bunny Ears Cactus



Bunny Ears Cactus. Photo credit: Courtesy of Queensland Department of Agriculture and Fisheries

Bunny Ears Cactus has pairs of pads that are covered in tufts of golden bristles. The pads grow in pairs and look like a pair of rabbit ears. It is usually a low, creeping plant with shallow roots. Bunny Ears Cactus forms dense thickets and:

- outcompetes native plants
- limits movement of animals and people
- competes with pasture plants reducing productivity
- has barbed bristles which can easily detach and injure people and animals
- can restrict recreational activities such as bushwalking and camping.

In NSW, there are infestations in the North West, Greater Sydney and Hunter regions. Bunny Ears Cactus can tolerate a wide range of conditions. It grows best in open areas, particularly in arid and semi-arid regions and is very drought tolerant. Bunny Ears Cactus has mostly been spread by people growing it as an ornamental plant. They may or may not be aware that it should not be grown. New plants can grow from parts of the stem or fruit when they come in contact with the soil. These plant parts can be spread by:

- moving water
- sticking to animals or vehicles
- people dumping garden waste.

Bunny Ears Cactus is not known to produce seeds in Australia.

Chicken Dance Cactus*Chicken Dance Cactus. Photo credit: Nicola Dixon (NSW DPI)*

Chicken dance cactus is an erect succulent shrub usually 0.7 to 1.8 m tall. It often has a trunk which may be up to 1 m tall. Chicken dance cactus has elongated fleshy pads with short spines and bristles. Chicken dance cactus competes with other plants. The sharp spines up to 1 cm long can:

- cause painful injuries to people, livestock, working dogs and pets
- injure and sometimes kill wildlife that get trapped in the spines
- devalue wool and hides and prevent shearing
- get stuck around the mouth of lambs or calves and prevent them from feeding.

It also forms dense thickets that can prevent movement of animals and people. This means that:

- animals may not be able to access feed
- mustering is difficult
- access to watering points is reduced
- recreational activities such as bushwalking and camping are restricted.

Chicken dance cactus has naturalised in a few locations in NSW including the Greater Sydney, Riverina and the South East regions. Chicken dance cactus can grow in a wide variety of soils and climates. Chicken dance cactus has mostly been spread by people growing it as an ornamental plant.

Common Pear*Common Pear. Photo credit: John Hosking (NSW DPI)*

Common pear is a cactus up to 2 m tall with spines, bristles, yellow flowers and purplish red fruit. It is a WoNS. Common pear can outcompete other plants and form dense infestations. It:

- restricts the movement of animals and people
- reduces productivity by outcompeting pasture plants and reducing access to feed
- makes mustering difficult
- reduces access to watering points
- outcompetes native plants
- reduces food and habitat for native animals
- makes recreational activities such as bushwalking difficult.

Common pear sometimes has spines that can:

- injure people, livestock, working dogs and pets
- get stuck around the mouth of lambs or calves and stop them feeding
- injure and sometimes kill wildlife that get trapped in the spines
- devalue wool and hides
- prevent shearing.

Common pear is also a host plant for fruit flies and provides harbour for pests including foxes and rabbits.

In NSW, common pear is mostly found in the North West and Hunter regions but is also found throughout NSW. Common pear can grow in tropical, subtropical, warm temperate and semi-arid climates. It tolerates full sun and shade. It grows in a wide range of soil types including saline soils, sand, loams and heavy clays. It can grow:

- in grasslands, woodlands shrublands and forests
- on steep, rocky slopes



- on beaches
- in disturbed areas such as roadsides
- on agricultural land.

Common Pear is spread by seeds and plant parts. An average of 110 seeds per fruit are produced, which are spread by birds and mammals which eat the fruit. Plant parts can be spread by animals, vehicles, water or wind and quickly take root.

Indian Fig



Indian Fig. Photo credit: Jen Schabel

Indian Fig is a tree-like cactus up to 7 m tall with very few spines. It is the only *Opuntia* species that is permitted for sale in NSW. It is grown by gardeners for its edible fruit. Indian Fig has never caused any problems to rural production. It spreads slowly and is easily eradicated. It was removed from the list of prohibited plants in 1978.

Indian fig grows sporadically in NSW. It prefers sandy, loamy, well-drained soil.

Riverina Pear*Riverina Pear. Photo credit: John Hosking (NSW DPI)*

Riverina pear is a branched shrub up to 2 m tall. It is usually erect but sometimes scrambles over the ground and climbs over other plants. Riverina pear is an invasive cactus that:

- competes with native plants
- reduces food and habitat for native animals
- competes with pasture plants, reducing productivity
- has bristles, and sometimes spines that can injure people and animals.

It forms dense thickets which:

- reduce access to watering points
- restrict access to feed for livestock and native animals
- make mustering difficult
- restrict recreational activities such as bushwalking and camping.

In NSW, it has been found in the Western, North Western, Riverina, Murray and Greater Sydney regions. Riverina pear grows in a wide variety of soil types but prefers well drained sandy soils. In its native range plants grow in loams and clay soils. It is drought hardy and grows in regions with more than 150 mm of rain per year. It could grow in most parts of NSW. It grows:

- along roadsides
- along the edges of waterways
- in bushland
- in grazing areas
- in disturbed areas.

Smooth Tree Pear*Smooth Tree Pear. Photo credit: Jen Schabel*

Smooth tree pear is an upright cactus up to 6 m tall though usually only 2 – 3 m. The stems have an obvious drooping appearance. It sometimes has a short woody trunk with clusters of large spines up to 10 cm long. Smooth tree pear is an invasive spiny cactus and is a WoNS. The spines can:

- injure people, livestock, working dogs and pets
- injure and sometimes kill native animals that gets trapped in the spines
- get stuck around the mouth of lambs or calves and stop them feeding
- devalue wool and hides
- prevent shearing.

Dense thickets of smooth tree pear restrict the movement of animals and people, so that:

- livestock cannot move to areas with better pasture
- mustering is difficult
- access to watering points is reduced
- recreation such as bushwalking or bird watching becomes difficult.

Smooth tree pear also:

- competes with native plants
- invades native pastures reducing productivity
- harbours pests including foxes, rabbits and fruit fly.

Smooth tree pear grows from coastal NSW to the Western region. Smooth tree pear mostly grows in subtropical, semi-arid and warmer temperate climates. It tolerates a wide variety of soil types though it is often found on sandy soils including coastal dunes. It grows in pastures, open woodlands, waterways, roadsides, railways and coastal areas. Birds and other animals eat the fruit and spread the seeds in their droppings. Stems can break off the plant and be distributed by animals, vehicles or moving water. Immature fruit will also grow into new plants.



Velvety Tree Pear*Velvety Tree Pear. Photo credit: Bruce Auld (NSW DPI)*

Velvety tree pear is a tree-like cactus whose pads are covered in fine velvety hairs. It outcompetes pasture grasses and native plants and is a WoNS. Velvety tree pear is an invasive cactus that:

- competes with native plants
- reduces food and habitat for native animals
- competes with pasture plants reducing productivity
- has bristles and sometimes spines that can injure people and animals.

It forms dense thickets which:

- reduce access to watering points
- restrict access to feed for livestock and native animals
- make mustering difficult
- restrict recreational activities such as bushwalking and camping.

In NSW, velvety tree pear grows in the North West and Greater Sydney regions. It has been in Australia since at least 1912 and may have been introduced as an ornamental plant. Velvety tree pear grows in subtropical, semi-arid and warm temperate climates. It is very drought tolerant. It grows in

- pastures and native grasslands
- open woodlands
- disturbed areas such as roadsides.

The seeds of velvety tree pear are viable and will sprout when there is enough moisture. Seeds can remain dormant in dry conditions for at least 18 months. Birds and other animals, including foxes, eat the fruit and spread the seeds in their droppings. Seeds can also be spread downstream by water. Velvety tree pear can regrow from pad segments, fruit and flowers. If the pads have spines they can spread by attaching to animals, footwear and vehicles. Plants can also spread by people dumping garden waste.



Wheel Cactus*Wheel Cactus. Photo credit: Bob Chinnock (NSW DPI)*

Wheel cactus is a succulent shrub usually 1–2 m tall with yellow flowers. Sometimes it is treelike with a distinct trunk and up to 4 m tall. Cacti pads have bumps on the surface called areoles. Spines, bristles, leaves, flowers, fruit, roots and new shoots all grow out of the areoles.

Wheel cactus forms dense thickets that outcompete low growing plants and prevent movement of animals and people. This means that:

- animals may not be able to access feed
- mustering is difficult
- access to watering points is reduced
- recreational activities such as bushwalking and camping are restricted.

Most plants have sharp spines that can:

- cause painful injuries to people, livestock, working dogs and pets
- injure and sometimes kill native wildlife that get trapped in the spines
- devalue wool and hides and prevent shearing
- get stuck around the mouth of lambs or calves and prevent them from feeding.

Wheel cactus competes with native plants, reducing food and habitat for native animals.

In NSW, most infestations of Wheel Cactus are in the Western Region. There has been one infestation in the South East in the Snowy Mountains. It was introduced into Australia as an ornamental plant. Wheel cactus grows in a wide range of climates. It mostly grows in arid, semi-arid warm temperate and subtropical climates but it can tolerate cooler temperate areas. It is very drought tolerant. Plants can survive extremely high temperatures up to 50 °C and low temperatures down to -7°C. Wheel Cactus tolerates a wide variety of soil types and grows very well in shallow granite soils.

b) Current Management

Reactive management, only managed on bush regeneration sites.



c) Control Options

Effective long-term control of Prickly Pears requires implementing a combination of control methods..

i) Chemical control

Spraying of herbicides is the most effective chemical control method for Prickly Pears. Herbicides include Triclopyr or a combination of Triclopyr and Picloram or Aminopyralid. Spray actively growing plants and cover all parts of the plant with herbicide. Check treated plants and control new growth.

ii) Mechanical removal

Dig up small or isolated plants using a mattock or other tools. Wear appropriate protective clothing and gloves to protect against injuries. Larger infestations of Prickly Pears may be controlled by machinery where there is good access to the site, the site is not environmentally sensitive and plant parts can be safely disposed of.

iii) Biological Controls

There are no useful agents in Australia for biological control of most Prickly Pears. The cochineal insect, *Dactylopius ceylonicus* can control Chicken dance cactus. Biological control is suitable for areas that are environmentally sensitive, too difficult to access or where other methods would be too expensive. Cochineal insects are less effective on scattered infestations and may require redistribution at these sites. There are several species of cochineal that look very similar. It is important to use the correct species of cochineal for each species of cactus. Contact your local council weeds officer for information about using cochineal to control cactus.

There are two successful biological control agents for Common Pear:

- cactoblastis moth, (*Cactoblastis cactorum*)
- cochineal bug (*Dactylopius opuntiae* 'stricta' lineage).

Two types of cochineal insect can effectively control Indian fig: *Dactylopius opuntiae* 'ficus' lineage and *Dactylopius opuntiae* 'Mexican' lineage.

Biological control using either of the two species of cochineal in conjunction with the Cactoblastis moth (*Cactoblastis cactorum*) can control Riverina pear. The two species of cochineal are:

- *Dactylopius opuntiae* ('stricta' and 'ficus' lineages)
- *Dactylopius ceylonicus*

The cochineal *Dactylopius ceylonicus* provides good control of smooth tree pear. It takes several years to kill plants. Control is slower in areas with high rainfall. Felling plants over 2 m tall and stacking the cut segments after the cochineal has established will speed up control.

The cochineal insect, *Dactylopius opuntiae* 'stricta' lineage can control velvety tree pear after several years. Cutting large plants (over 2 m tall) and stacking the stems will speed up control.

Two types of cochineal insect can effectively control large, dense infestations of wheel cactus:

- *Dactylopius opuntiae* 'ficus' lineage
- *Dactylopius opuntiae* 'Mexican' lineage.



Biological control is suitable for areas that are environmentally sensitive, too difficult to access or where other methods would be too expensive. Cochineal insects are less effective on scattered infestations and may require redistribution at these sites.

iv) Prevention of spread and Education

This requires the practice of good hygiene of boots, tyres, vehicles etc to prevent accidental and intentional spread to un-infested regions. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through transported equipment. Dispose of plant parts appropriately by burying it at least one metre deep or by burning in a hot fire. Otherwise, avoid driving or walking through areas with Prickly Pears. Do not grow Prickly Pears in gardens or pots. Do not take cuttings of unknown cactus plants to grow out or share with others. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

v) Challenges

Control of Prickly Pears usually requires follow up after initial efforts to control regrowth. Large infestations can be costly to treat with chemicals and the spines on Prickly Pears can cause serious injury when physically removing plants.

d) Implementation

For maximum efficiency of time and funding, Prickly Pears can be treated at the same time as other priority bushy weeds such as Lantana (*Lantana camara*), blackberry (*Rubus fruticosus* agg.), Boneseed (*Chrysanthemoides monilifera* subsp. *monilifera*) and Bitou Bush (*C. monilifera* subsp. *rotundata*).

e) Monitoring

Monitoring should be one of the first activities implemented at a control site. It will provide a benchmark to assess the progress at the site. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines such as the Opuntoid Cacti Management Guide (WA DPIRD).

f) Procedures

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Salvinia (Salvinia molesta)

Salvinia. Photo credit: Hamilton Turner (CC0 1.0)

Status: Contain

a) Background

Salvinia is a free-floating aquatic fern that is capable of rapid growth in still or slow-flowing water. It spreads vegetatively by fragmentation and can double in size in under three days. Each plant will produce over 8000 plants within the first month of infesting a waterbody.

Salvinia also spreads to new areas by attaching to vehicles, boats, and animals. Human activities such as use in aquariums and fishponds and inappropriate disposal methods further exacerbate the likelihood of it spreading. Salvinia can completely cover the waterbody surface removing light that submerged plants and associated fauna rely on. This has negative implications for native habitats, water quality, and provides a breeding ground for mosquitoes. Further, it has major impacts for the waterways recreational and transport activities including swimming, boating and fishing.

The whole Greater Sydney region has been established as an exclusion zone with the objective of ensuring containment of the Salvinia and is listed as a WoNS. The Hawkesbury-Nepean and Georges Rivers and their tributaries have been classified as the core infestation area. Salvinia is widely distributed in the Liverpool LGA area and land managers should prevent spread of the species from their land and notify the local control authority (Council) if the plant is identified on their land. While broad scale elimination is not practicable, minimisation of the biosecurity risk posed by this species requires containment and removal where it is reasonably practicable. In addition to this, within the region (exclusion zone), land should be kept free of Salvinia and eradicated where it occurs. Within the core infestation area, land managers are to prevent spread from their land where feasible and reduce the impact on priority assets. Additionally, under the Mandatory Measure (Division 8, Clause

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

33, Biosecurity Regulation 2017): a person must not move, import into the State or sell *Salvinia*. The recognized strategic response for the region is ongoing suppression and removal of the plant, and to monitoring changes to the distribution to prevent spread.

As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

Currently Council is undertaking proactive management of *Salvinia* in Liverpool LGA in line with Biosecurity and regional priority of containment. It is present on numerous Council owned and managed waterbodies of which are actively managed.

c) Control Options

Successful control of *Salvinia* is dependent on the integration of techniques. Suitable techniques are determined by the size of the infestation. There are a variety of control methods including the following:

i) Physical

For small infestations, plants can be manually removed, and care needs to be taken to remove all plant material. Booms and nets may be effective for containment, mitigating short term spread. The collected material is more easily controlled with chemicals or mechanical techniques. For medium to large areas and/ or densities of the plant, manual removal is generally not feasible. Council is responsible for providing advice on how to dispose of the weed.

ii) Mechanical

Aquatic weed harvesters can be used to remove the plant. However, the weed will regenerate, and so mechanical removal needs to be conducted regularly for effective results. This method is expensive and so is primarily feasible for dense infestations only.

iii) Chemical

There are several herbicides available for use to control *Salvinia* and these are most successful when the infestation is controlled early. Chemical controls can be limited by having good access to the weed in the waterbody and the infestation density. It can be difficult to get good herbicide contact where the leaves are compact and densely folded. *Salvinia* can rapidly reinfest sites, so it is important to target as much of the plant mass as practical. Large infestations should not be sprayed all at once to prevent mass die-off and water pollution. Chemical controls are effectively used after removing as much plant mass as possible via physical/ mechanical means.

The NSW Weed Control Handbook and NSW Weedwise provides up-to-date details for suitable registered herbicides. All herbicides should be applied in accordance with their directions.

iv) Water Management

The reduction of nutrient levels is known to help control *Salvinia*. This includes preventing effluent and other waste from entering waterways. Erosion on cultivated land should be managed and stock access to banks and waterways minimized.

v) Biological

The *Salvinia* Weevil (*Cyrtobagous salviniae*) can be effective for plant containment. Adult weevils feed on the growing tips which suppresses plant growth and larvae tunnel through the stems which can cause parts of the biomass to sink and decompose in the waterway. Weevil populations can take 2-3 years to establish, and local climate impacts the level of control. They are most effective in warmer climates (~30°C), but populations can take longer to establish in cooler climates (~20°C) and may require repeated introduction. Breeding generally ceases below 17°C meaning this method is

ineffective in cold climates. Biological controls cannot eradicate the species and are most effectively used in collaboration with other techniques

vi) Challenges

Growth can also be stimulated by rain due to runoff and increased nutrient loading in the waterway. As *Salvinia* remains a popular aquarium and pond plant despite bans being in place Australia, there is ongoing risk of re-infestation of local waterways. Care also needs to be taken when using chemical controls to not saturate waterbody with decomposing *Salvinia* which can cause subsequent water health issues.

d) Implementation

Management of nutrient inflows, physical removal of infestations where practical and the use of biological agents where appropriate should be implemented for the containment of *Salvinia*. For maximum efficiency of time and funding, *Salvinia* in waterways can be treated at the same time as these other priority aquatic weeds. Distribution and treatment for Alligator Weed and Water Hyacinth is very similar to *Salvinia*. This is particularly relevant for chemical and mechanical controls.

Decaying plant matter can cause negative environmental impacts and be aesthetically unpleasant. Considerations should be made to use a combination of control methods and remove as much biomass is practical to mitigate further impacts to the waterway. Material disposal should be conducted in such a way that reduces reinfestation risk. Where herbicides are used, steps should be taken to keep nutrient loading and decay volume to a minimum to prevent secondary impacts.

e) Monitoring

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines.

Salvinia is still used as a popular aquarium and ornamental pond plant (obtained illegally from other commercial businesses or locations) which poses risks of it entering waterways via the stormwater system. Ongoing compliance and surveillance are important to prevent further use and spread of the plant in this way.

f) Procedures

Proactive program with prevention strategies and annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Skunk Vine (*Paederia foetida*)

Skunk vine. Photo credit: Hyun-tae Kim (CC BY 4.0)

Status: Eradicate

a) Background

Skunk Vine is an invasive, pungent, semi-woody vine with rapid growth that has naturalised in the Greater Sydney region. The weed grows quickly and aggressively and can create dense shade. This is both harmful for understory plants and the heavy vines cause damage to trees and shrubs. Negative impacts of the weed include smothering and damage to native vegetation and associated fauna. Skunk Vine is likely to cause damage and displacement to native species and can alter community structure. The weed can also invade urban areas and form mats over lawns or smother ornamental plants. The vine reproduces vegetatively, and can spread via stem or root fragments, seeds, and dumped garden waste. Historically Skunk Vine has been spread widely around the world as a result of its use as an ornamental plant.

Skunk Vine has been classified as a regional priority weed in Greater Sydney with the objective of eradication. Species presence in the region is limited in abundance and distribution and elimination of the biosecurity risk it poses is reasonably practical. General biosecurity duty for the species in Liverpool LGA is that land managers eradicate and keep their land free from Skunk Vine and notify the Local Control Authority (Council) if they identify it on their land. Additionally, the plant (inclusive of all its part) cannot be grown, traded, carried, or released into the environment. The recognized strategic response for the region is the detailed surveillance, mapping, and destruction of all infestations where practical. Management must be in accordance with the NSW Weed Incursion Plan and appropriate quarantine and hygiene protocols should be implemented.

As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

Council considers eradication of Skunk Vine a priority. There is currently very limited distribution of the species in Liverpool LGA with known infestations in West Hoxton and Warwick Farm and Council undertakes proactive management.

c) Control Options

i) Chemical

There are a variety of herbicides available to control Skunk Vine. Herbicide applications should be applied directly to the foliage and damage to surrounding non-target native vegetation mitigated. There are a range of appropriate application techniques and include options for spot spraying, spatter gun, wiping onto leaves and cut scrape and paint depending on the infestation character.

All herbicides should be applied in accordance with their directions. NSW Weed Wise should be used for up-to-date information on registered herbicides, dosage and the best application methods. Appropriate permits for herbicide usage should be sought, particularly if spraying near waterways.

ii) Non-Chemical Controls

Small infestations can be controlled by mechanical removal. However, where the infestation is dense, regrowth is likely and large-scale manual removal isn't usually successful. Any plant matter that is removed must be suitably disposed of to prevent seed germination or stem fragments taking root.

There is no biological control agent for Skunk Vine.

Further control information can be found at NSW WeedWise at weeds.dpi.nsw.gov.au.

d) Implementation

Eradication and monitoring of existing Skunk Vine infestations in Liverpool LGA should include chemical control and suitable disposal of plant matter. Council should also undertake proactive controls and surveillance to prevent further spread. Education and awareness activities of the regional importance should be pursued to increase knowledge for relevant stakeholders including land managers, private landholders, and the public.

e) Monitoring

Eradication is considered feasible and ongoing monitoring, surveillance and mapping should be incorporated within management plans in line with best practice guidelines.

f) Procedures

Proactive program with prevention strategies and annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Tiger Pear (*Opuntia aurantiaca*)

Tiger pear Photo credit: Florencia Grattarola (CC0 1.0)

Status: Eradicate

a) Background

Tiger Pear is a low spreading cactus with sharp spines that can cause injuries to humans and animals. It can grow in a range of climates and soil types, and once established is highly drought tolerant. Spread occurs by plant parts with new plants growing from fruit of small segments which detach and make contact with soil. Spread occurs via flowing water, garden waste and attaching to a variety of surfaces including animal coats, machinery, tyres and footwear.

Tiger Pear is listed as a WoNS and has negative impacts for agriculture, wildlife, and community. The weed has sharp, barbed spines which can cause serious injuries to people, livestock, domestic pets, and wildlife. Where the weed forms dense thickets, movement of animals can be restricted with implications for livestock access to feed, mustering, access to water and recreational activities such as camping and bushwalking.

The whole Greater Sydney region has been established as an exclusion zone with the objective of ensuring containment of the species. The core infestation areas have been classified for nearby LGAs (Wollondilly and Blacktown). Liverpool LGA is in the exclusion zone and whilst broad scale elimination is not practicable, minimisation of the biosecurity risk posed by this species requires containment and removal where it is reasonably practicable. Land managers should prevent spread of Tiger Pear from their land notify the local control authority (Council) if the plant is identified on their land.

Within the exclusion zone, Tiger Pear should be eradicated, and land kept free of the species. Within the core infestation area, land managers are to prevent spread from their land where feasible and

reduce the impact on priority assets. Additionally, under the Mandatory Measure (*Division 8, Clause 33, Biosecurity Regulation 2017*): a person must not move, import into the State or sell Tiger Pear. The recognized strategic response for the region is to ongoingly suppress and remove the plant, and to monitor changes to the distribution to prevent spread.

As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

Council considers eradication and active surveillance for new incursions of Tiger Pear a priority. There is currently very limited distribution of the species in Liverpool LGA and council undertakes proactive management.

c) Control Options

Successful management requires a combination of control methods and is dependent on follow up controls after initial efforts including surveillance and removal of new growth.

i) Prevention

Avoid contact with Tiger Pear where possible and in an infestation area, vehicles, machinery, tyres and footwear should all be checked before leaving. Any plant parts which may have attached to any surfaces should be removed and disposed of carefully.

ii) Physical Control

For small and isolated plants, manual removal can be appropriate. Large infestations may require machinery to conduct ploughing. Where physical control techniques are used, care must be taken to remove the roots and for appropriate disposal of the plant mass. Personal protective equipment and clothing is essential to prevent injuries.

Proper disposal of the weed is critical for successful containment. Disposal of plant material should be done by either burning in a hot fire or burying it at least one metre below the surface. Council is responsible for providing information about appropriate local disposal.

iii) Biological Control

A number of biological agents are available for Tiger Pear. Core infestations can be effectively controlled by Cochineal insects (*Dactylopius austrinus*); however, this is more successful during hot dry summers than in wetter periods as the species reproduces faster than can be controlled by the agents. Two moth species can provide some level of control, the Cactoblastis moth (*Cactoblastis cactorum*) and the stem-boring moth (*Tucumania tapiacola*). These are less effective than the Cochineal and are already widespread so don't require redistribution.

iv) Chemical Control

A variety of herbicides are available to chemically control the weed. These are most effective when used on actively growing plants which usually occurs in October and February. It is important to ensure all parts of the plant are covered in herbicide and that treated plants are ongoingly checked. New growth should be controlled. Where the infestation is sparse or scattered, chemical controls are a practical control strategy.

All herbicides should be applied in accordance with their directions. NSW Weed Wise should be used for up-to-date information on registered herbicides, dosage and the best application methods. Appropriate permits for herbicide usage should be sought, particularly if spraying near waterways.

v) Challenges

The key challenges for Tiger Pear are adequately disposing of removed material and ensuring sufficient follow up controls. Prevention of infestations and their spread is the most effective management

Liverpool City Council



strategy for any noxious weed, particularly as there is limited distribution currently in the Liverpool LGA. The challenge is to develop and deploy effective and efficient ways to contain an infestation before it becomes widespread

d) Implementation

Proactive controls, monitoring and surveillance should be a Council priority. Education and awareness activities of the regional importance should be pursued to increase knowledge for relevant stakeholders including land managers, private landholders, and the public.

e) Monitoring

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines.

f) Procedure

Proactive program with prevention strategies and annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Water Hyacinth (*Eichhornia crassipes*)



Water Hyacinth. Photo credit: Lucy Keith-Diagne (CC BY 4.0)

Status: Contain

a) Background

Water Hyacinth is a free-floating perennial herb known as a fast growth aquatic weed. It grows on open bodies of fresh water, preferring still water with high nutrient loads. Growth is both rapid and very dense and is known to form heavy rafts of biomass. Reproduction is very efficient as plants reproduce both vegetatively from stolons and seed germination and plant numbers can double in five days. Seeds can germinate in three days and remain viable for at least 15 years. There is ongoing risk of it spreading after heavy rainfall from existing infestations or illegal ornamental plantings. One plant can produce enough growth to cover 600 square meters and this dense mass can choke waterbodies, causing oxygen and light depletion. This has negative implications for native habitats, water quality, and provides a breeding ground for mosquitoes. Further, it has major impacts for the waterways recreational and transport activities including swimming, boating and fishing. Large rafts can also damage structures such as bridges and dams due to their heavy weights (estimated 400 tons/ Ha). The species was introduced to Australia as an ornamental aquatic plant in the 1890's, but quickly became a pest for major rivers and creeks. This species does not grow in brackish water which has relevance to the Liverpool LGA where there are areas with tidal rivers and creeks.

Water Hyacinth has been classified as a State and regional priority weed in Greater Sydney with the objective of containment and asset protection from the species. Broad scale elimination is not practicable; however, minimisation of the biosecurity risk posed by this species requires containment and removal where it is reasonably practicable. A Biosecurity Zone (Part 5, Division 4, Biosecurity Regulation 2017) for strategic management of the species has been established in the State, however, the Greater Sydney region is excluded from this as it is a core infestation area. The general biosecurity duty for the species in Liverpool LGA is that land managers prevent its spread where feasible and that the plant, (inclusive of all its parts) cannot be grown, traded, carried or released into the environment.

Liverpool City Council



Additionally, under the Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): a person must not move, import into the State or sell Water Hyacinth.

The recognized strategic response for the region is to develop and implement a community campaign; and promote best practice principles to landholders. This includes supporting a range of control methods for integrated weed management and maintaining competitive vegetation/crops/pastures, hygiene and property management plans.

As the local control authority for weeds under the *Biosecurity Act 2015*, it is the elected council that is ultimately responsible for delivery of these weed control functions.

b) Current Management

Council considers eradication and active surveillance for new incursions of Water Hyacinth a priority. There is currently very limited distribution of the species in Liverpool LGA and council undertakes proactive management.

c) Control Options

Successful management requires a combination of control methods and is dependent on follow up controls after initial efforts including surveillance and removal of new plants.

i) Physical

If practical, small infestations can be removed manually. The plants can be physically removed from the waterway before seed set; however, care needs to be taken to prevent further spread of the weed. Rakes and nets can be used to drag the plant to the water's edge where it can be left to dry out on the waterway banks. Council is responsible for providing advice on how to dispose of the weed.

ii) Mechanical

Aquatic weed harvesters can be used to collect weed. Weed is then deposited on the waterway banks or in a sealed truck. Where feasible, this method is preferred over chemical herbicides as there is less decaying biomass left in the waterbody. Weed mass is instantly removed with immediate improvements for the waterway's aesthetic appearance and no increases to its nutrient load.

iii) Chemical

Chemical control is the most cost-effective strategy for large infestations and should be implemented when the weed is actively growing (generally in spring) for optimum results. Treatment is usually undertaken with handgun power sprays from the bank or boat. Aerial spraying has been used for larger infestations.

This method will cause the weed mat to sink and rot, which can lead to water de-oxygenation and fish kills. To prevent this, as much biomass as possible should be removed before spraying. This is particularly pertinent for larger infestations and NSW DPI recommends spraying only one third at a time. The New South Wales Weed Control Handbook provides up-to-date details for suitable registered herbicides.

All herbicides should be applied in accordance with their directions. NSW Weed Wise should be used for up-to-date information on registered herbicides, dosage and the best application methods. Appropriate permits for herbicide usage should be sought, particularly if spraying near waterways.

iv) Biological

Biological controls are suitable for long term management of the species as they can reduce flowering and occasionally cause the sinking of plant mats. In NSW, two insects (a weevil and moth), have been released for biological control of the species. These insects burrow into the plant, enabling water and bacteria to cause the plant to rot. Both agents have been released in the Western Sydney region. Biological controls alone do not control the species.

v) *Cultural Control*

A number of cultural controls can aid suppression of Water Hyacinth. For infested waterways, this includes retaining salty water or introducing it; minimizing nutrient run-off and/or reducing water levels to lower the area covered.

vi) *Prevention*

Prevention of infestations and their spread is the most effective management strategy for any noxious weed. Proactive controls, monitoring and surveillance should be a Council priority.

Education and awareness activities of the regional importance should be pursued to increase knowledge for relevant stakeholders including land managers, private landholders, and the public.

vii) *Challenges*

Decaying plant matter can cause negative environmental impacts and be aesthetically unpleasant. Considerations should be made to use a combination of control methods and remove as much biomass is practical to mitigate further impacts to the waterway. Material disposal should be conducted in such a way that reduces reinfestation risk. Where herbicides are used, steps should be taken to keep nutrient loading and decay volume to a minimum to prevent secondary impacts.

d) **Implementation**

For maximum efficiency of time and funding, Water Hyacinth in waterways can be treated at the same time as other priority aquatic weeds. Distribution and treatment for Alligator Weed and Salvinia is very similar to Water Hyacinth.

e) **Monitoring**

Eradication in most core area infestations is generally not feasible. Long-term management strategies aim for containment, reduction of impact by limiting spread, and suppression of biomass and density. There is a strong emphasis on preventing spread from the core areas. As such, ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines.

Water Hyacinth is known to still be used as an ornamental plant in ponds and dams (obtained illegally from other commercial businesses or other locations) which poses risks of it entering waterways via the stormwater system. Ongoing compliance and surveillance are important to prevent further use and spread of the plant in this way.

f) **Procedures**

Proactive program with prevention strategies and annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Willows (*Salix* spp.)



Willow spp.. Photo credit: Hunter Regional Weeds

Status: Asset Based Protection

a) Background

There are 32 different groups (species, varieties, subspecies and hybrids) of Willows in Australia and Willows are listed as WoNS. The Willows that have caused the most environmental damage are Grey Willow (*Salix cinerea*), Crack Willow (*Salix fragilis* var. *fragilis*), and Black Willow (*Salix nigra*). The relatively recent introduction of New Zealand Willows (*Salix matsudana* hybrids) which also fertilizes Weeping Willow (*Salix babylonica*) are both emerging threats. Willows are deciduous trees or shrubs that form large, dense root-mats on the surface of the soil or in shallow water and slow-moving streams. They invade thousands of kilometres of riverbanks and numerous wetlands in temperate Australia.

Willows are among the worst weeds in Australia due to their invasiveness, potential for spread, and economic and environmental impacts. They have invaded riverbanks and wetlands in temperate Australia, occupying thousands of kilometres of streams and numerous wetland areas. Unlike most other vegetation, willows spread their roots into the bed of a watercourse, slowing the flow of water and reducing aeration. They form thickets which divert water outside the main watercourse or channel, causing flooding and erosion where the creek banks are vulnerable. Willow leaves create a flush of organic matter when they drop in autumn, reducing water quality and available oxygen. This, together with the amount of water willows use, damages stream health. The replacement of native vegetation by willows reduces habitat for both land and aquatic animals.

Most Willows spread by fragments of stems or twigs breaking off and growing new roots in water. Pieces can travel many kilometres before establishing at a new site. Fishermen often break off twigs and stick them in the riverbank to hold their lines, and these pieces will also grow. Seed is the main method of spread for several species, especially Grey Sallow and Black Willow. Seed carried by wind or water easily travels more than 1 km, with small amounts potentially spreading up to 100 km.

Willows occur naturally in permanently or seasonally wet, inundated or waterlogged sites. The largest infestations in Australia are in Victoria, Tasmania, New South Wales and the Australian Capital Territory.

Liverpool City Council



Integrated Pest Management
Strategy



Liverpool City Council - Final
Draft

Several species (Weeping, Basket and Crack Willows) have been widely planted along the rural waterways of southeastern Australia for erosion control.

b) Current Management

Reactive management, only managed on bush regeneration sites.

c) Control Options

Effective long-term control of Willows requires implementing a combination of control methods with follow-up and monitoring. Willows are relatively easy to kill and mechanical and chemical control techniques are well understood. However, it should be noted that indiscriminate removal of willows is not recommended as it may lead to stream instability. Clearing any vegetation along waterways may cause erosion and may require consent before any work starts. It is the landholder's responsibility to obtain any approvals that may be required prior to undertaking clearing.

i) Chemical control

Herbicides available for woody weeds are effective in controlling willow. Common suitable herbicides includes Glyphosate, and Picloram with Tryclopyr or Aminopyralid. Trees can be killed by stem injection, application to leaves and stems, bark (chemical girdling) and cut and paint methods. In dry conditions herbicide can also be applied by basal bark spraying and treatment of seedlings. Although stem injection may be a slower, more laborious method, it is an important option for avoiding chemical runoff and protecting native vegetation. In general, herbicide should be applied from summer to early autumn, although stem injection or cut and paint application is effective year round.

Stem injection is suited to large trees. Make cuts or drill holes below the branches, around the trunk, 20–30 mm into sapwood. The injection points should be single cuts spaced at less than 130 mm intervals, or holes drilled at 50–100 mm intervals, around the circumference. Angle holes and cuts downwards to minimise herbicide leakage. Herbicide should be immediately injected into each cut or hole at the recommended rate. Leave the tree undisturbed for at least 12 months after herbicide application to ensure a successful kill.

Cut stump application should only be used to kill willows that can be easily and safely disposed of (i.e. smaller specimens). Cut the aerial trunk off completely at a level below the first branches and immediately apply a recommended herbicide to the cut stump. Remove all material to prevent regeneration from pieces. The cut surface of the removed stem should also be painted with herbicide for safe disposal. Minimal transport of branches and stems will help avoid broken fragments being spread. Willow wood chips can take root and grow so trees for chipping should be killed prior to removal.

The entire plant can be foliar sprayed if it is less than 2 m tall before the start of leaf fall and where herbicides will not affect native plants or make contact with water bodies.

ii) Mechanical removal

Elimination of young seedlings is a cost-effective way of keeping waterways free of potential blockages, erosion and streambed change. Hand pulling of seedlings less than 0.5 m tall is the most practical and environmentally safe way of removing young plants. Leaving small roots in the ground does not lead to suckering or regrowth. Using large machinery such as excavators or bulldozers to remove larger trees and root systems is not recommended except in dry areas. In wet areas bulldozers push broken branches into the ground and thus generate numerous new plants.

iii) Biological Controls

There are no useful agents in Australia for biological control of Willows.

Liverpool City Council



iv) Prevention of spread and Education

Early detection and control are essential to prevent the spread of new infestations. The deliberate planting of willows along waterways has virtually ceased and extensive removal operations are common. It is fairly easy, given enough resources, to prevent the spread of willows that propagate by plant parts, as they are confined to streams and are spread downstream. For seeding willows, prevention of spread is difficult because seed can be dispersed over large areas. Willows are still widely planted, e.g. for windbreaks on farms, and many groups (including weedy ones) are sold by the nursery trade in Australia. There is potential for additional willow taxa to become naturalised if importation is not closely regulated. Education material for landowners and the public for identifying and reporting new outbreaks of the species should be produced.

v) Challenges

A long-term plan should be devised before any attempt is made to eliminate problem willows. Removal of trees can actually increase erosion problems, so a plan to replace willows with more desirable species is needed. Start by carrying out an extensive survey to identify potential seed sources. The willow species that set seed flower between September and November, so this is the best time to search for catkins on or under trees. Staged removal should be undertaken over a number of years, starting in the upper reaches of each catchment and working downstream. Where willows have been planted to stabilise soils or banks, alternative vegetation should be established before the willows are removed. Remove trees first which will not destabilise banks (e.g. on the inside of bends). Anticipate stream flow changes and be aware that removal of constrictions will allow greater pressure at restricted points further downstream. In these cases it may be advisable to start working on the lower end of the section, progressing upstream.

d) Implementation

For maximum efficiency of time and funding, Willows should be managed in a staged strategy that begins in the upper reaches of the catchment. First remove trees on the inside of bends because these banks are more stable.

e) Monitoring

Regrowth from stumps, pieces of stems or seeds will need to be followed up with monitoring and further control for 3–5 years after the initial effort. Check that treated trees have died, and remove trees that could cause problems if they become snared elsewhere by floods. Look for the spread of any new willows and follow up with substantial re-assessments at least every five years. Ongoing monitoring and surveillance should be incorporated within management plans in line with best practice guidelines such as the Willows National Management Guide (VIC DPI).

f) Procedures

A proactive program with annual treatment on Council lands including the targeting of recurring sites and reinfestations in line with best practice and informed by rigorous reporting and surveillance.



Species Name	Common Name	Impacts	NSW Biosecurity Act 2015	Greater Sydney Regional Strategic Pest Animal Plan 2018-2023	NSW Local Land Services (LLS) Act 2013
<i>Felis catus</i>	Cat	*Predation of native fauna *Aggressive in urban areas *Virus proliferation in animal shelters	Not Listed	Priority (Asset based protection)	Not Listed
<i>Vulpes vulpes</i>	European Fox	*Predation of native fauna, livestock and domestic animals	Not Listed	Priority (Asset based protection)	Under the LLS Act 2013 there is a Pest Control Order for the European Red Fox released in 2014 which states that: "Pursuant to sections 130(1)(c) and 130(2)(d) of the Act, Local Land Services is empowered to serve an individual eradication order in accordance with Part 10 of the Act, on any occupier or owner (other than a public authority) of controlled land requiring the occupier or owner to eradicate the pest by use of a method specified by Local Land Services in the individual eradication order."
<i>Cervidae sp</i>	Deer	*Destructive herbivory *Environmental degradation *destroying native vegetation by trampling plants, grazing, and ring-barking young trees *fouling waterholes *causing soil erosion *spreading weeds *potentially transmitting diseases such as foot-and-mouth disease.	Not Listed	Priority (Asset based protection/Eradicate/Contain)	Deer control across the Greater Sydney region is complex as some deer populations are managed as pests and others as game animals (LLS, 2018). Under Schedule 3, Part 1 of the Game and Feral Animal Control Act 2002 deer are declared as a game animal in NSW.
<i>Culicidae sp</i>	Mosquito	*Disease transmission	Not Listed	Not listed	Not listed
<i>Sus scrofa</i>	Feral Pig	*Predation *Habitat degradation *Competition *Disease transmission	Not Listed	Priority (Eradicate/Contain/Asset based protection)	Under the LLS Act 2013 there is a Pest Control Order for Feral Pigs released in 2016 meaning that Council has a responsibility to destroy any that are found on Council land.
<i>Capra hircus</i>	Feral Goat	*Habitat degradation *Competition *Disease transmission	Not Listed	Priority (Asset based protection/Eradicate)	Not Listed
<i>Trachemys scripta elegans</i>	Red-eared Slider Turtle	*Competition *Disease transmission	Listed under schedule 3 part 4 of the Biosecurity Act 2015 as a prohibited dealings species	Alert Species	Red-eared slider turtles are listed as an alert species under the LLS Greater Sydney Regional Strategic Pest Animal Management Plan (2018).
<i>Acridotheres tristis</i>	Indian/Common Mynah Bird	*Competition	Not Listed	Priority (limited action)	Not Listed
<i>Cyprinus carpio</i>	European Carp	*Competition *Destructive herbivory *Fouling of water quality	Not Listed	Priority (limited action)	Not Listed
<i>Rhinella marina</i>	Cane Toad	*Predation *Toxic *Competition	Not Listed	Alert Species	Not Listed
<i>Oryctolagus cuniculus</i>	Rabbit	*Competition *Destructive herbivory *Land degradation	Not Listed	Priority (Asset based protection)	Under the LLS Act 2013, there is a Pest Control Order dated 11th July 2014 which applies to all land in NSW. It states the Rabbit is declared to be a pest and that: "Pursuant to sections 130 (1) (c) and 130 (2) (i) of the Act the administration to any rabbit of fibroma virus vaccine or myxoma virus vaccine is prohibited, unless such administration is approved by the Minister."
<i>Columba livia domestica</i>	Feral pigeons	*Competition *Disease transmission	Not Listed	not listed	Not Listed

Species Name	NSW Companion Animals (CA) Act 1998	EPBC Act 1999	BC Act 2016	Other Legislation
<i>Felis catus</i>	Under the Companion Animals Act 1998 it is the responsibility of Local Government to regulate domestic cats through identification and control of nuisance cats. Councils may designate Wildlife Protection Areas under this Act from which cats must be excluded. Similarly cats must be excluded from national parks and reserves.	Predation of native wildlife by Cats is listed as a key threatening process under the EPBC Act 1999	Predation of native wildlife by Cats is listed as a key threatening process under the NSW BC Act 2016	There is a Commonwealth (2015) Threat Abatement Plan in place for predation by cats.
<i>Vulpes vulpes</i>	Not listed	Predation by foxes is listed as a key threatening process under the EPBC Act 1999	Predation by foxes is listed as a key threatening process under the BC Act 2016	There is a Commonwealth (2008) and NSW (2010) Threat Abatement Plan in place for Predation by the Red Fox (<i>Vulpes vulpes</i>).
<i>Cervidae sp</i>	Not listed	Not listed	Herbivory and environmental degradation caused by wild deer is listed as a key threatening process under the NSW BC Act 2016	<i>Game and Feral Animal Control Act 2002</i>
<i>Culicidae sp</i>	Not listed	Not listed	Not listed	N/A
<i>Sus scrofa</i>	Not listed	Predation, habitat degradation, competition and disease transmission by feral pigs is listed as a key threatening process under the EPBC Act 1999	Predation, habitat degradation, competition and disease transmission by feral pigs is listed as a key threatening process under NSW BC Act 2016.	Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (<i>Sus scrofa</i>) - (2017)
<i>Capra hircus</i>	Not Listed	Competition and land degradation by unmanaged goats is listed as a key threatening process under the EPBC Act 1999.	Competition and land degradation by unmanaged goats is listed as a key threatening process under the NSW BC Act 2016	There is a Commonwealth (2008) Threat Abatement Plan in place for predation, habitat degradation, competition and disease transmission by feral goats.
<i>Trachemys scripta elegans</i>	Not listed	Not listed	Not listed	They are included in the top 100 of the 'world's worst' invasive species by the International Union for the Conservation of Nature (IUCN), due to their invasive nature and their potential impacts on biodiversity. It is illegal to keep red-eared slider turtles as pets in NSW under the Non-Indigenous Animals Act, 1987
<i>Acridotheres tristis</i>	Not Listed	Not Listed	Not Listed	Mynas were listed among 100 of the world's worst invasive species by the World Conservation Union (IUCN) in 2000
<i>Cyprinus carpio</i>	Not Listed	Not Listed	Not Listed	Under the Fisheries Management Act 1994 the introduction of non-indigenous fish and marine vegetation to the coastal waters of New South Wales is listed as a key threatening process, as is the introduction of fish to waters within a river catchment outside their natural range
<i>Rhinella marina</i>	Not Listed	The biological effects, including lethal toxic ingestion, caused by Cane Toads (<i>Bufo marinus</i>) are listed as a key threatening processes under the EPBC Act 1999	Invasion and establishment of the Cane Toad is listed as a key threatening process under the NSW BC Act 2016.	There is a Commonwealth (2011) Threat Abatement Plan in place for the biological effects, including lethal toxic ingestion, caused by cane toads
<i>Oryctolagus cuniculus</i>	Not Listed	Competition and land degradation by rabbits is also listed as a key threatening process under the EPBC Act 1999	Competition and grazing by the European rabbit is listed as a key threatening process under the BC Act 2016	There is a Commonwealth (2016) Threat Abatement Plan in place for competition and land degradation by rabbits.
<i>Columba livia domestica</i>	Not Listed	Not Listed	Not Listed	Not Listed

Species Name	Council Opinion	Community Concern (based on complaints and reports)	Invasion Curve Status	Classification (Priority/Nuisance)
<i>Felis catus</i>	Community education and engagement related matters important actions. Can be further addressed by a species specific Pest Management Plan in the future if a detailed response needs to be developed to lead further actions.	Some complaints by community members. Most complaints relate to stray or roaming cats being fed within urban areas.	Asset based protection	Priority (reason - regional priority, severity of environmental impacts)
<i>Vulpes vulpes</i>	Widespread species that would require landscape / regional approach for effective management.	Detected in in both rural and urban areas including on motion sensing cameras.	Asset based protection	Priority (reason - regional priority, severity of environmental impacts)
<i>Cervidae sp</i>	The increasing number of Wild Deer in western Liverpool is a concern. Wild Deer create traffic hazards on the roads, graze on private and commercial gardens, impact on primary produces and threaten bushland areas. Council is working towards a Deer Management Plan which is currently underway in Penrith LGA	Deer detected in Western Liverpool Area. Fallow Deer are regularly sighted in Greendale along the Nepean River corridor as well as in Rossmore along the South Creek corridor.	Contain	Priority (reason - regional priority, severity of environmental impacts, early intervention)
<i>Culicidae sp</i>	Council has a Mosquito Management Plan (September 2019). Recognised as pest to include as a health priority.	Reports received during peak mosquito seasons	Asset based protection	Priority (reason - human health)
<i>Sus scrofa</i>	Pigs have been previously detected within the Liverpool LGA, suspected to be dumped. They are a threat to bushland and vigilance is required to identify new incursions.	Occasional sighting in rural areas of LGA	Eradicate	Priority (reason - regional priority, severity of environmental impacts, early intervention)
<i>Capra hircus</i>	Goats escape from private land and sometimes move across rural land, particularly creek corridors. No feral populations known.	Escaped Goats have been know to inhabit the South Creek Corridor	Eradicate	Nuisance
<i>Trachemys scripta elegans</i>	Appear to have inhabited waterway across Liverpool for many years	The community appear to be not concerned due to the negligible/low direct impact on the community.	contain	Nuisance
<i>Acridotheres tristis</i>	Council focus on education given the limited feasibility of controlling the extensive population.	Common complaint by community members due to species inhabiting highly urbanised areas.	asset based protection	Nuisance
<i>Cyprinus carpio</i>	Carp have a negative impact on the water quality and biodiversity of waterbodies and waterways	Council receives infrequent complaints about Carp	asset based protection	Nuisance
<i>Rhinella marina</i>	Cane Toads are being found more frequently around Sydney. Vigilance is required to ensure that any incursion is rapidly controlled.	One incursion of an individual toad.	eradicate	Nuisance
<i>Oryctolagus cuniculus</i>	Rabbits are widespread across Liverpool, making asset based protection the most suitable response.	Reports are typically from highly urbanised areas, and are often escaped/released pets	asset based protection	Nuisance
<i>Columba livia domestica</i>		Common complaint by community members	asset based protection	Nuisance

Species Name	Current Action	Proposed Actions
<i>Felis catus</i>	Council does not currently have any pest management programs in place for cats. Removal limited due to restrictions under companion animal act and "no kill" shelters. Liverpool Urban Cat Management Plan, desexing subsidy for pensioners, and educational information on website regarding responsible pet ownership	Expand education program. Investigate establishing wildlife protection areas within high conservation lands (asset based protection).
<i>Vulpes vulpes</i>	Council does not currently have any control programs in place for foxes	Work collaboratively with any regional programs that are initiated.
<i>Cervidae sp</i>	Council currently has funding from Greater Sydney LLS to undertake a control program in western/rural Liverpool as part of the Greater Sydney Wild Deer Management Program.	Due to the highly mobile nature of Wild Deer a coordinated focus is required with neighboring Councils and Greater Sydney Local Land Services to establish an ongoing program.
<i>Culicidae sp</i>	Council have Mosquito Management Plan (September 2019) and educational material on website. Nuisance species of Mosquitoes also included for education actions such as website material.	Continued management in accordance with Mosquito Management Plan
<i>Sus scrofa</i>	Reactive management often in association with LLS	Ongoing surveillance of Council land to ensure early detection. Continue to work with land managers and LLS to swiftly manage any new incursion.
<i>Capra hircus</i>	Reactive management often in association with LLS	See updates to plan in email Relate to updates in deer management. Also Frogbit spelling; Invasion curve graphic (Probably can't fix this)
<i>Trachemys scripta elegans</i>	No current strategic plan in place	reactive management in collaboration with DPI and other agencies. community education on species and how to report sightings to DPI
<i>Acridotheres tristis</i>	No formalised plan or strategy	education via website and fact sheets on subjects such as how to deter them, and information on trapping. investigate program partners for trapping.
<i>Cyprinus carpio</i>	Reactive management. Carp are of particular concern to water quality at Wattle Grove Lake, where an annual electro fishing removal program is undertaken.	Continue management at Wattle Grove Lake and investigate opportunities to expand management as required.
<i>Rhinella marina</i>	Reactive management	Continue to work with LLS to investigate and address any incursions. Community education on species and how to report sightings to DPI
<i>Oryctolagus cuniculus</i>	Can only manage certain populations in rural/wildlife areas	work collaboratively with any regional programs that are initiated
<i>Columba livia domestica</i>	No formalised plan or strategy	education via website and fact sheets on subjects such as how to deter them

Species Name/Group Name	Common Name	Impacts	NSW Biosecurity Act 2015	NSW Weed Wise	Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022
<i>Lycium ferocissimum</i>	African Boxthorn	*Competition *Injures stock *Resource for pest animals *Poisonous to humans	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (asset protection)
<i>Alternanthera philoxeroides</i>	Alligator Weed	*Competition *Negtaive water quality effects	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale. Biosecurity Zone Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone	Listed as Weed of National Significance	State Priority (containment) Regional Priority (containment)
<i>Asparagus</i> spp.	Asparagus weeds	*Competition *Reduces biodiveristy	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale. Prohibited matter A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries - bridal veil creeper (<i>A. declinatus</i>)	Bridal creeper (<i>A. asparagoides</i>), bridal veil creeper (<i>A. declinatus</i>), climbing asparagus (<i>A. africanus</i>), climbing asparagus fern (<i>A. plumosus</i>), foxtail fern (<i>A. densiflorus</i>), and ground asparagus (<i>A. aethiopicus</i>) are listed as Weeds of National Significance	State Priority (prevention) - bridal veil creeper (<i>A. declinatus</i>) State Priority (asset protection) - asparagus weeds Regional Priority (eradication) - climbing asparagus fern (<i>A. plumosus</i>), ming fern (<i>A. macowanii</i> var. <i>zuluensis</i>), sicklethorn (<i>A. falcatus</i>), asparagus fern (<i>A. virgatus</i>)
<i>Rubus fruticosus</i> agg.	Blackberry	*Competition *Reduces biodiveristy *Blocks access *Resource for pest animals	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (asset protection)
<i>Chrysanthemoides monilifera</i> sub <i>monilifera</i> and <i>rotundata</i>	Boneseed and Bitou Bush	*Competition *Reduces biodiveristy	All of NSW The Bitou Bush Biosecurity Zone is established for all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the south. Biosecurity Zone Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone. Boneseed Control Zone (Whole of NSW): Owners and occupiers of land on which there is boneseed must notify the local control authority of new infestations; immediately destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of boneseed must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.	Listed as Weeds of National Significance	State Priority (eradication) - monilifera, State Priority (containment) - <i>C. monilifera</i> sub. <i>rotundata</i>
<i>Dolichandra unguis-cati</i>	Cat's Claw Creeper	*Competition *Reduces biodiveristy *Negtaive water quality effects	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (asset protection) , Regional Priority (asset protection)
<i>Nassella neesiana</i>	Chilean Needle Grass	*Competition *Reduces biodiveristy *Injures livestock	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (asset protection)
<i>Hyparrhenia hirta</i>	Coolatai Grass	*Competition *Biodiversity reduction *Agricultural pest	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Not listed	Weed of regional concern (Appendix 2 of Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022)
<i>Senecio madagariensis</i>	Fireweed	*Reduces productivity *Poisonous to livestock	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (asset protection)
<i>Limnobium</i> spp.	Frogbit	*Competition *Biodiversity reduction	Prohibited Matter (Part 4, Biosecurity Act, 2015): A person who deals with any biosecurity matter that is Prohibited Matter throughout the State is guilty of an offence.	Not listed	State Priority (prevention)
<i>Dovyalis caffra</i>	Kei Apple	*Safety Hazard *Competition *Biodiversity reduction	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Not listed	Regional Priority (eradication)
<i>Lantana camara</i>	Lantana	*Competition *Toxicity	Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): A person must not import into the State or sell.	Listed as Weed of National Significance	State Priority (asset protection)

Species Name/Group Name	Common Name	Impacts	NSW Biosecurity Act 2015	NSW Weed Wise	Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022
<i>Ludwigia peruviana</i>	Ludwigia	*Competition *Biodiversity reduction *Negative water quality effects	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Not listed	Regional Priority (asset protection)
<i>Anredera cordifolia</i>	Madeira Vine	*Competition *Biodiversity loss *Toxicity	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (asset protection)
<i>Opuntia</i> spp.	Prickly Pears - Opuntias	*Competition *Biodiversity loss *Injures native wildlife and stock *Reduces production *Blocks access for stock and humans *Reduces resources and habitat for native wildlife	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (asset protection) Regional Priority (eradication) - tiger pear (<i>O. aurantiaca</i>)
<i>Salvinia molesta</i>	Salvinia	*Competition *Biodiversity reduction	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (asset protection) , Regional Priority (containment)
<i>Paederia foetida</i>	Skunk Vine	*Competition *Biodiversity reduction	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Not listed	Regional Priority (eradication)
<i>Opuntia aurantiaca</i>	Tiger Pear	*Competition *Biodiversity reduction	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	Regional Priority (containment)
<i>Eichhornia crassipes</i>	Water hyacinth	*Competition *Biodiversity reduction *Negative water quality effects	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (containment), Regional Priority (asset protection)
<i>Salix</i> spp.	Willows	*Competition *Biodiversity loss *Negative water quality and water flow effects *Reduces resources and habitat for native wildlife	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Listed as Weed of National Significance	State Priority (asset protection)
<i>Olea europaea</i> subsp. <i>cuspidata</i>	African Olive	*Competition *Biodiversity reduction	Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Not listed	Regional Priority (containment)

Species Name/Group Name	BC Act 2016	Other Legislation	Council Opinion	Invasion Curve Status	Classification (Priority/Weed of Concern)
<i>Lycium ferocissimum</i>			Manage in line with Biosecurity priority and state priority – Asset Based Protection	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Alternanthera philoxeroides</i>		<i>NSW Alligator Weed Strategy 2000-2005 (DPI)</i>	Manage in line with Biosecurity priority and regional priority - Containment Common in the Cabramatta Creek catchment and rural western Liverpool. Occasionally found in rural dams	Contain	Priority (reason - state/regional priority, severity of environmental impacts)
<i>Asparagus</i> spp.			Manage in line with Biosecurity priority and regional/state priority by species: ☑State Priority (prevention) - bridal veil creeper (<i>A. declinatus</i>) ☑State Priority (asset protection) - asparagus weeds ☑Regional Priority (eradication) - climbing asparagus fern (<i>A. plumosus</i>), ming fern (<i>A. macowanii</i> var. <i>zuluensis</i>), sicklethorn (<i>A. falcatus</i>), asparagus fern (<i>A. virgatus</i>)	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Rubus fruticosus</i> agg.			Manage in line with Biosecurity priority and state priority – Asset Based Protection	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Chrysanthemoides monilifera</i> sub <i>monilifera</i> and <i>rotundata</i>	Invasion of native plant communities by <i>Chrysanthemoides monilifera</i>	<i>NSW Bitou Bush Threat Abatement Plan (2006)</i>	Manage in line with Biosecurity priority and regional priority - Eradicate Known to grow on the eastern side of the Liverpool LGA on sandy soils. Also an isolated infestation in Bringelly	Eradicate	Priority (reason - state priority, biosecurity duty, severity of environmental impacts)
<i>Dolichandra unguis-cati</i>	Cat's claw creeper is listed as a Key Threatening Process in NSW because of its potential to impact on endangered and vulnerable plants		Localised populations. Early intervention desirable to avoid larger issues in the future.	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Nassella neesiana</i>	Invasion of native plant communities by exotic perennial grasses		Prevent spread in plant and brushcutting machinery desirable - very invasive. Widespread, particularly around Cecil Hills	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Hyparrhenia hirta</i>			Council consider this a priority for containment. Very limited distribution, with potential for spread.	Eradicate	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Senecio madagariensis</i>			Manage in line with Biosecurity priority and state priority – Asset Based Protection	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Limnobia</i> spp.			Council consider this a priority. Eradication and active surveillance for new incursions. Very limited distribution	Eradicate	Priority (reason - state priority, early intervention)
<i>Dovyalis caffra</i>			Manage in line with Biosecurity priority and regional priority - eradicate. Council consider this a priority to eradicate. Very limited distribution with known infestations in Austral and Kemps Creek	Eradicate	Priority (reason - regional priority, early intervention)
<i>Lantana camara</i>	Invasion, establishment and spread of Lantana (<i>Lantana camara</i> L. sens. Lat)		Manage in line with Biosecurity priority and state priority – Asset Based Protection. Widespread across the Liverpool LGA	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)

Species Name/Group Name	BC Act 2016	Other Legislation	Council Opinion	Invasion Curve Status	Classification (Priority/Weed of Concern)
<i>Ludwigia peruviana</i>			Council consider this a priority. Contain species to current extent. Occurs on numerous Council waterbodies	Contain	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Anredera cordifolia</i>	Invasion and establishment of exotic vines and scramblers		Manage in line with Biosecurity priority and state priority – Asset Based Protection	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Opuntia</i> spp.			Manage in line with Biosecurity priority and state priority – Asset Based Protection	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Salvinia molesta</i>			Manage in line with Biosecurity priority and regional priority - Containment. Actively managed on numerous Council owned/managed waterbodies	Contain	Priority (reason - state/regional priority, severity of environmental impacts)
<i>Paederia foetida</i>	Invasion and establishment of exotic vines and scramblers		Council consider this a priority, listed as eradication under regional plan. Very limited distibution with known infestions in West Hoxton and Warwick Farm	Eradicate	Priority (reason - regional priority, severity of environmental impacts, early intervention)
<i>Opuntia aurantiaca</i>			Council consider this a priority due to limited distribution in LGA. Eradication and active surveillance for new incursions. Very limited distribution	Eradicate	Priority (reason - regional priority, severity of environmental impacts, early intervention)
<i>Eichhornia crassipes</i>			Council consider this a priority to contain. Eradication on council land and active surveillance for new incursions. Very limited distribution	Contain	Priority (reason - state/regional priority, severity of environmental impacts, early intervention)
<i>Salix</i> spp.			Manage in line with Biosecurity priority and state priority – Asset Based Protection	Asset based protection	Priority (reason - local priority to limit spread, severity of environmental impacts)
<i>Olea europaea</i> subsp. <i>cuspidata</i>	Key Threatening Process		Contain species to current extent. Strategic, mosaic removal prioritising areas of greatest conservation significance (asset based protection). Widespread across the Liverpool LGA.	Asset based protection	Weed of Concern

Species Name/Group Name	Current Action	Proposed Actions
<i>Lycium ferocissimum</i>	Reactive management, only managed on bush regeneration sites.	Same as current action.
<i>Alternanthera philoxeroides</i>	Annual control on multiple sites. Biological control (Flea Beetle) also active. Reactive management elsewhere	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread.
<i>Asparagus</i> spp.	Reactive management, only managed on bush regeneration sites.	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread.
<i>Rubus fruticosus</i> agg.	Reactive management, only managed on bush regeneration sites.	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread.
<i>Chrysanthemoides monilifera</i> sub <i>monilifera</i> and <i>rotundata</i>	Regular surveillance and control. Reactive management	Same as current action
<i>Dolichandra unguis-cati</i>	Asset protection as part of Bush Regeneration projects	Same as current action
<i>Nassella neesiana</i>	Reactive management, only managed on bush regeneration sites.	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread.
<i>Hyparrhenia hirta</i>	Proactive management of all infestations.	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread. eradicate new incursions.
<i>Senecio madagariensis</i>	Reactive management, only managed on bush regeneration sites.	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread.
<i>Limnobium</i> spp.	Proactive management. Routine monitoring and reporting.	Same as current action
<i>Dovyalis caffra</i>	Proactive management. Large effort to remove this species	Same as current action
<i>Lantana camara</i>	Reactive management, only managed on bush regeneration sites.	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread.

Species Name/Group Name	Current Action	Proposed Actions
<i>Ludwigia peruviana</i>	Proactive management	Same as current action
<i>Anredera cordifolia</i>	Reactive management, only managed on bush regeneration sites.	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread.
<i>Opuntia</i> spp.	Reactive management, only managed on bush regeneration sites.	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread.
<i>Salvinia molesta</i>	Proactive management.	Proactive management of all infestations.
<i>Paederia foetida</i>	Proactive management	Same as current action
<i>Opuntia aurantiaca</i>	Proactive management	Same as current action including property inspections.
<i>Eichhornia crassipes</i>	Proactive management	Same as current action including property inspections.
<i>Salix</i> spp.	Reactive management, only managed on bush regeneration sites.	Same as current action. Increased staff awareness and machinery hygiene protocols to limit the spread.
<i>Olea europaea</i> subsp. <i>cuspidata</i>	Asset based protection as part of Bush Regeneration projects	Same as current action. Extensive distribution in LGA that would make priority containment response unfeasible. Asset based protection response in bushland areas and roadside verges.

Summary of Feedback Received During Consultation for the IPM Strategy and Policy

Feedback	Response
EAC Feedback	
1. Consider additional pest management practices including cultural burns, biodynamics and fungi.	Action 12 of the Strategy promotes an adaptive approach to considering additional control methods on a case-by-case basis. As Council is not an Indigenous Land Management agency, there are limitations on the role that can be taken in applying indigenous land management practices such as cultural burns. Council is working to keep First Nations cultures and practices alive by collaborating with Firesticks Alliance and Local Land Services to engage with the local Aboriginal community.
2. Concerns raised regarding potential use of baiting.	Control methods are consistent with best practice methodologies and include animal ethics considerations. Humane and appropriate use of each control method is included in Appendix E of the Strategy.
3. Greater Sydney Regional Strategic Weed Management Plan should be considered.	This Plan was reviewed as part of the development of the Strategy to help inform which species would be considered and the appropriate management response. Additional weed species identified by the Plan as asset protection state priority weeds have been included in the revised Strategy.
4. Query regarding why weeds and pest animals were included in a single strategy.	There is substantial overlap between the management principles and prioritisation of weed and animal pests. Collating them into a single strategy ensures a consistent approach.
5. Formatting improvements such as page numbering and table format.	The Strategy was revised in response to the suggested formatting improvements.
6. Environment Restoration Plan works not always completed in areas of high conservation.	This matter is the subject of action 10 of the Strategy.
7. Recommend feedback sought from the Companion Animal Committee.	Feedback from the Companion Animals Advisory Committee was sought during the public exhibition period. Motions raised at their meeting held on 14 June 2022 have been considered (see below).
8. Difficulties regarding ensuring compliance of private landholders.	The primary focus of the Strategy is land that is managed by Council. However, actions such as routine biosecurity inspections will assist to achieve outcomes on private land.
9. Include current deer control activities in Appendix E.	Appendix E has been revised to include details regarding deer control activities.
10. Proposed approach considered to be sound.	Noted.

Feedback	Response
11. Council can only prosecute if there is a gazetted weed plan.	Regulatory enforcement action for breaches of the <i>Biosecurity Act 2015</i> does not require a gazetted weed plan.
Motions from Companion Animals Advisory Committee meeting (held on 14 June 2022)	
12. Committee to make enquiries about any existing and the feasibility of establishing a wildlife protection area.	There are no existing Wildlife Protection Areas within Liverpool LGA. The consideration of these has been identified as an action in the Strategy, and is addressed in section 8.1 and Appendix E of the Strategy.
13. Committee recommends promoting and education regarding more than one bell on neck collars.	This matter could be included as a component of the expanded education program action noted for cats within the Strategy.
14. Committee recommends the removal of the use of all traps.	Control methods are consistent with best practice methodologies and include animal ethics considerations. Humane and appropriate use of each control method is included in Appendix E of the Strategy.
Submissions received during public exhibition (3-30 June 2022)	
15. Additional weeds should be identified as a priority.	See response to item #3 regarding the inclusion of additional species. Actions in Sections 8.2.1 and 8.2.4 of the Strategy have also been refined to further address weeds of concern.
16. LCC 'no kill policy' should be removed.	The LCC 'no kill policy' applies to the animal shelter operations for domestic animals only, not pests.
17. Reconsider Council's preference to protect areas of higher conservation value.	Giving priority to protecting areas of high conservation value is industry best practice. It also aligns with legislative requirements to provide value-for-money to rate payers. This does not preclude operational management (including weed control) of lower conservation value sites.
18. Need plans to address pest animals, such as cats, that work.	The IPM Strategy sets out Council's strategic approach to managing pests and identifies feasible and reasonable measures in accordance with the <i>Biosecurity Act 2015</i> . Domestic animals are not recognised as pests within the Strategy and their management has additional considerations under the <i>Companion Animals Act 1998</i> .
19. Customer service data is irrelevant.	Many of the pest control actions that Council undertakes are the result of customer service enquiries. Council encourages community reporting of pest species. The customer service data was not the basis of species prioritisation, but was useful in providing a snapshot of customer concerns.



MINUTES OF LIVERPOOL LOCAL TRAFFIC COMMITTEE MEETING

17 May 2023

COMMITTEE MEMBERS

Councillor Karress Rhodes	LCC - Chairperson
Siva Balasubramaniam	Transport for NSW (TfNSW)
Nicholas Petkovic	Representative of the Member for Leppington
Charishma Kaliyanda	Member for Liverpool
Wayne Prior	Representative of the Member for Macquarie Fields

COMMITTEE TECHNICAL ADVISORS

Councillor Peter Harle	LCC
Charles Wiafe (CW)	Manager Transport Management, LCC
Mahavir Arya	Transport Engineer, LCC
Patrick Bastawrous	Team Leader Transport Management
Parth Tiwari	Assistant Transport Engineer, LCC
Hannah Shilling	Representative of Transit System
Yooral Soni	Representative of Interline Bus Services
Rachel Palermo	Road Safety Officer, LCC

APOLOGIES

Councillor Nathan Hagarty	LCC
Tanya Davies	Member for Mulgoa
Joanna Lonsdale	Traffic Sergeant, Liverpool City Police Area Command
Councillor Betty Green	Representative of the Member for Liverpool
Toula Athanasiou	Road Safety Officer, LCC

WELCOME, ATTENDANCE, APOLOGIES AND OPENING	
The Chairperson opened the meeting at 9.35 am and acknowledged the traditional custodians of the land.	
DECLARATIONS OF INTEREST	
Nil	
CONFIRMATION OF PREVIOUS MINUTES	
CW advised that the minutes of the 15 March 2023 Committee Meeting was adopted by Council at its meeting on 26 April 2023.	
Council resolved that the General Business Item 5 be reconsidered at the May Traffic Committee Meeting	
AGENDA ITEMS	
ITEM	SUBJECT
1	First Avenue/ Hoxton Park Road, Hoxton Park – Proposed Extension of Northbound Right Turn Lane
2	Edmondson Avenue, Austral – Proposed Relocation of Raised Pedestrian Crossing
3	Miller CBD - 40km/hr High Pedestrian Activity Area Traffic Study Recommendation
4	Miller Public School, Miller – Proposed Installation of a Raised Pedestrian Crossing
5	Kurrajong Road, Lyn Parade to Amity College, Prestons – Revised Lane Configuration
6	Lismore Street, Hoxton Park – Request for Improved Traffic Conditions
7	Henderson Road, Edmondson Park – Request for Installation of Indented Parking Bays
8	Hill Road, Lurnea – Review of Parking Arrangement and Request for Ambulance Parking Space
9	Request for Indented Parking Bays Along Sections of Esk Avenue and Brunswick Heads Crescent, Hoxton Park
10	Cecil Hills High School, Cecil Hills – Proposed Traffic Management Changes
11	Items Approved Under Delegated Authority
TECHNICAL DISCUSSION	
ITEM	SUBJECT
TD1	Manning Street, Warwick Farm – Request for Horse Crossing Facility
GENERAL BUSINESS ITEMS	
ITEM	SUBJECT
GB1	Spencer Road, Cecil Hills– Request for a Raised Pedestrian Crossing
GB2	Warwick Farm - Request for Residential Parking Scheme
GB3	Slow Down to 50km/h Road Safety Campaign
GB4	Woodlake Court, Wattle Grove – Request for a Speed Hump
GB5	Webster Road, Lurnea - After Hour Truck Parking Concerns

Close – Meeting closed at 12.20pm

ITEM 1**First Avenue/ Hoxton Park Road, Hoxton Park – Proposed Extension of Northbound Right Turn Lane****INTRODUCTION**

The Committee, at its February 2023 meeting, considered a concern about traffic delay for right turn movements from First Avenue into Hoxton Park Road and supported extension of the existing right turn bay.

The recommendation outlined that Council prepares detailed design of the extension of the northbound right turn lane between Twentieth Avenue and Hoxton Park Road and submit to the Committee for endorsement.

The required detailed design has been prepared and the Committee is requested to support extension of the northbound right turn bay along First Avenue as indicated in Attachments 1.1 -1.4.

ASSESSMENT

First Avenue is a north-south local collector road, between Hoxton Park Road and Brownes Farm Reserve.

The road has a signalised intersection with Hoxton Park Road and a cul-de-sac adjoining the reserve. The signalised intersection has 2 lanes on the First Avenue approach, line marked with a dedicate right turn lane and a through/left kerbside lane. A locality map is shown below.



Traffic investigations have identified that the right turn movement from First Avenue exceeds the capacity of the existing right turn bay.

A solution is to extend the length of the right turn bay. This requires removal of a kerb blister which provides a narrow road section for pedestrians to cross via a pedestrian refuge.

Removal of the blister will allow two northbound lanes in the section between Twentieth Avenue and Hoxton Park Road. In addition, the existing lane line marking will be extended by approximately 100m to formalise the two lanes approximately 3m wide. The existing timed No Stopping (during school times) signs are to remain along the section on both sides of the road.

A design of the extension of the right turn bay and relocation of the existing pram ramps closer to the roundabout at the First Avenue and Twentieth Avenue intersection, has been carried out in accordance with Austroads and TfNSW guidelines.

RECOMMENDATION

That the Committee supports:

- Extension of the northbound right turn lane between Twentieth Avenue and Hoxton Park Road including installation of lane lines by approximately 100m and,
- Relocation of the existing pram ramp closer to the roundabout at the First Avenue and Twentieth Avenue intersection as indicated in Attachments 1.1 -1.4

COMMITTEE DISCUSSION

The representative for the Member for Leppington enquired about whether there is a proposal to open the closed southern end of First Avenue to connect to Nineteenth Avenue.

CW advised that Council has such a proposal and it is outlined in Item 6 in the agenda and would be discussed further.

The Committee discussed and supported the proposed extension of the right turn bay.

COMMITTEE RECOMMENDATION

The Committee supports:

- Extension of the northbound right turn lane between Twentieth Avenue and Hoxton Park Road including installation of lane lines by approximately 100m and,
- Relocation of the existing pram ramp closer to the roundabout at the First Avenue and Twentieth Avenue intersection as indicated in Attachments 1.1 -1.4
- Council to undertake consultation with the residents along the affected section of First Avenue prior to the extension.

ITEM 2	Edmondson Avenue, Austral - Proposed Relocation of Raised Pedestrian Crossing
---------------	--

INTRODUCTION

The Land and Environment Court has approved development of a childcare centre at the western side of Edmondson Avenue almost opposite the existing Austral Public School. The driveway to the childcare centre is proposed off Edmondson Avenue at the existing raised pedestrian crossing in front of the school.

Council has received design drawings from the developer to relocate the existing raised pedestrian crossing approximately 10m south of its current location.

The Committee is requested to support the proposed relocation along with the associated signs and linemarking scheme, as shown in Attachment 2.

ASSESSMENT

As indicated above, The Land and Environment Court has approved development of a childcare centre at the western side of Edmondson Avenue almost opposite the existing Austral Public School. The Public School fronts Edmondson Avenue and has an existing raised threshold as shown below.



The driveway to the childcare centre is at the existing pedestrian crossing and hence the consent condition requires the crossing to be relocated by approximately 10m south of the current location. A drawing showing this location in relation to the existing crossing is as indicated in Attachment 2.

To direct pedestrians to the new crossing, a pedestrian fence will be installed from the school gate to the crossing.

The design has been undertaken in accordance with Austroads and TfNSW design guidelines. The detailed design plans are to be submitted to TfNSW for review prior to installation.

RECOMMENDATION

That the Committee supports:

- Relocation of the existing raised pedestrian crossing approximately 10m south of the existing location across the section of Edmondson Avenue, along Austral Public School.
- Detailed design plans are to be submitted to TfNSW for review prior to installation.
- The Public School principal and community to be advised before the relocation and information about the new crossing to be included in the school's newsletter and/or social media channels

COMMITTEE DISCUSSION

The Committee discussed and supported the relocation noting that the adjoining school would be notified prior to the relocation to ensure that pedestrian desired line from the school to the crossing is maintained and if required, fencing installed to channel pedestrians to the new crossing.

COMMITTEE RECOMMENDATION

The Committee supports:

- Relocation of the existing raised pedestrian crossing approximately 10m south of the existing location across the section of Edmondson Avenue, along Austral Public School.
- Detailed design plans are to be submitted to TfNSW for review prior to installation.
- The Public School principal and community to be advised before the relocation and information about the new crossing to be included in the School's newsletter and/or social media channels.
- The installation work is to be carried out to minimise construction impacts during school holidays.

ITEM 3	Miller CBD - 40km/hr High Pedestrian Activity Area Traffic Study Recommendation
---------------	--

INTRODUCTION

As advised, at the Committee Meeting in March 2023, Council has received funding from TfNSW to undertake traffic studies to identify traffic facilities that would enable the establishment of 40km/h speed limit High Pedestrian Activity Areas (HPAA) in Carnes Hill, Miller and Edmondson Park town centres.

Council has engaged consultants to undertake the required traffic studies. At its March 2023 meeting, the Committee considered and endorsed the recommendations of the HPAA study for Carnes Hill and Edmondson Park Town Centres. Study report for the Miller Town Centre has now been completed and the recommended facilities, as outlined below, and shown in Attachment 3.

The Committee is requested to support the recommended traffic facilities for the Miller Town Centre HPAA for a detailed design to be carried out.

Following completion of the detailed design, when funding is secured, the designs will be presented to a future Traffic Committee meeting for its support.

ASSESSMENT

Council has received concerns from shoppers and residents regarding traffic speed, pedestrian and vehicle conflicts in the Miller town centre. To address these concerns, TfNSW has allocated funding for a consultant to be engaged to undertake a traffic study to identify traffic facilities that would enable the establishment of a 40km/h speed limit High Pedestrian Activity Areas (HPAA) in the Miller town centre.

Miller Town Centre is bounded by Cartwright Avenue in the north, Cabramatta Avenue in the west and Shropshire Street in the south.

The road network in the Miller Town Centre HPAA study area are as follows.

1. Cartwright Avenue - Busby Road to Woodward Road (E) including an existing roundabout at its intersection with Heckenberg Avenue.
2. Woodward Crescent – entire road section.
3. Lady Woodward Place – entire road section
4. Shropshire Street – Cabramatta Avenue to approx. 40m west of Lady Woodward Place

Cartwright Avenue in the study area has a 60km/h sign posted speed limit whilst the remaining streets have the General Urban Speed Limit of 50km/h.

The study area contains, residential, retail, recreational and support services developments and is well served by bus and taxi services. Therefore, there is significant pedestrian movements in the study area.

The study area for the Miller Town Centre HPAA, is as shown in the locality map below.



The study area has existing pedestrian facilities at the following locations:

- Raised pedestrian crossings in Cartwright Avenue and Woodward Crescent.
- Marked pedestrian crossings in Shropshire Street and Cabramatta Avenue
- Pedestrian refuges at the existing roundabouts at the Cartwright Avenue intersections with Heckenberg Avenue and Busby Road.

The study has included speed classifications, crash data analysis, assessment of existing traffic conditions, and identification of pedestrian facilities and desired lines.

Following the traffic study, the consultant has recommended the following traffic management facilities to help establish a slow speed environment and ensure a self-enforcing 40km/h speed limit in the Miller Town Centre.

Recommended Treatments

Recommended treatments are as follows:

- a) Gateway entry treatments with Entry 40km/h speed limit signs at the following locations:
- Cartwright Avenue - east of Busby Road on the roundabout departure.
 - Cartwright Avenue - east of Woodward Crescent on approach to Woodward Crescent.
 - Heckenberg Avenue - north of Cartwright Avenue on the roundabout approach.
 - Shropshire Street – west of Cabramatta Avenue at the existing 40K School Zone.

- b) Midblock raised thresholds
 - Cartwright Avenue - west of roundabout at Heckenberg Avenue intersection.
 - Woodward Crescent – in both north-south road sections.
- c) New marked pedestrian crossing
 - Shropshire Street – east of Lady Woodward Place at the existing pedestrian desire line.
- d) Upgrade of existing pedestrian crossings to raised thresholds.
 - Shropshire Street – west of Lady Woodward Place.
 - Cabramatta Avenue – south of Shropshire Street at the front of Michael Wenden Aquatic Leisure Centre.
- e) Other Changes
 - Cartwright Avenue – removal of the existing pedestrian refuge west of Woodward Crescent (W) as there is an existing pedestrian refuge at the Busby Road roundabout.

A drawing of these treatments is shown in Attachment 3.

RECOMMENDATION

That the Committee supports the recommendations of additional traffic facilities to be installed in the Miller Town Centre as indicated in Attachment 3, to establish and support a High Pedestrian Activity Area in the streets surrounding the town centre.

COMMITTEE DISCUSSION

The Committee discussed, noted, and supported the recommendations in-principle.

In response to an inquiry about the proposed device across Heckenberg Avenue, the Chairperson was advised that the proposed entry device would be across the southbound traffic only and the turning path would accommodate service vehicles and additional traffic.

The Member for Liverpool enquired whether funding has been secured for the recommended traffic facilities. In response, CW advised funding has not been allocated. Following completion of the detailed design, cost estimates would be prepared, and funding submission would be made to TfNSW for funding.

COMMITTEE RECOMMENDATION

The Committee supports:

- The recommendations of additional traffic facilities to be installed in the Miller Town Centre as indicated in Attachment 3, to establish and support a High Pedestrian Activity Area in the streets surrounding the town centre.
- Community consultation to be undertaken and feedback be included in the detailed design.
- A copy of the detailed designs be sent to TfNSW prior to installation.

ITEM 4	Miller Public School, Miller – Proposed Installation of a Raised Pedestrian Crossing
---------------	---

INTRODUCTION

Miller Public School has frontages to Miller Road and Shropshire Street, has a total of four children crossings, consisting of two children crossings across Shropshire Street, one across Miller Road and one marked pedestrian crossing.

Council has received representations, including from the school, requesting for upgrade of an existing children crossing across Miller Road to a marked raised pedestrian crossing to improve pedestrian safety.

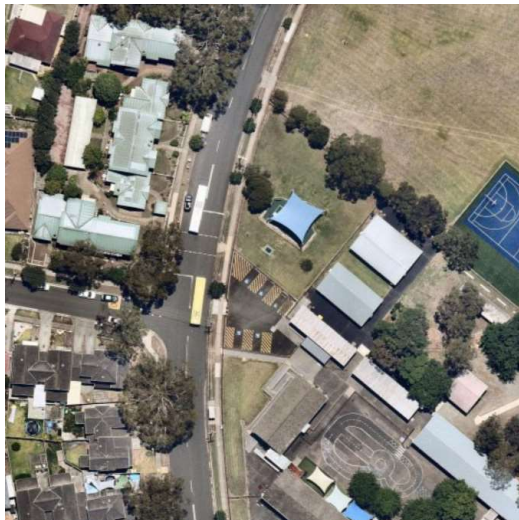
Council has investigated including carrying out traffic counts, which has identified that the children crossing location meets the warrant for upgrade to a marked pedestrian crossing. Design of the crossing has been carried out, as shown in Attachment 4.

The Committee is requested to support the upgrade of the existing children crossing to a raised pedestrian crossing.

ASSESSMENT

As indicated above, Miller Public School has one marked pedestrian crossing and two children crossing across Shropshire Street and one across Miller Road.

The children crossing is across the northern section of Miller Road close to the northern school boundary.



Due to residential development along the western side of the road, the crossing attracts significant pedestrian movements which meets the warrant for a marked pedestrian crossing. A summary of the traffic and pedestrian counts are as follows:

	AM Pedestrians	AM Vehicles	PM Pedestrians	PM Vehicles	PV
Miller Road	24	112	65	145	9,425

As indicated above, the existing crossing attracts significant pedestrian movements particularly during the afternoon peak periods, however, the traffic volume is lower than the previous traffic volume warrants for the requested marked pedestrian crossing.

However, the school community is very concerned that the existing children crossing does not have a crossing supervisor and that some motorists do not give way to pedestrians at the existing crossing and hence the request for the upgrade.

In response, it is considered that an upgrade to a marked pedestrian crossing would provide a safer crossing facility and provided the required flood lighting is installed, it should operate well.

The upgrade would require street light improvements and the current location of the children's crossing can be moved slightly north, under the existing power pole. The final location would be determined in consultation with Endeavor Energy and the School.

The existing children's crossing has No Stopping restrictions on approach and departure sides. This restriction would be retained as part of the upgrade, as an interim arrangement, the school has been provided with information on how to apply for a crossing supervisor who would assist the children and parents to cross Miller Road safely.

RECOMMENDATION

That the Committee:

- Supports upgrade to a marked raised pedestrian crossing across the northern section of Miller Public School, as shown in Attachment 4.
- Council to undertake community consultation with the school and affected residents prior to installation.
- Detailed design to be submitted to TfNSW for review prior to installation.

COMMITTEE DISCUSSION

The Committee discussed and supported the installation, noting that the adjoining school would be notified prior to the installation to ensure that pedestrian desired line from the school to the crossing is maintained.

CW outlined that the final location of the crossing would ensure adequate lighting is available and if required, installation of flood lighting would be considered.

COMMITTEE RECOMMENDATION

The Committee:

- Supports upgrade to a marked raised pedestrian crossing across the northern section of Miller Public School, as shown in Attachment 4.
- Council to undertake community consultation with the school and affected residents prior to installation.
- Detailed design to ensure adequate flood lighting and a copy be submitted to TfNSW for review prior to installation.

ITEM 5	Kurrajong Road, Lyn Parade to Amity College, Prestons – Revised Lane Configuration
---------------	---

INTRODUCTION

Council has been requested to investigate options to improve traffic flow along the section of Kurrajong Road, between Amity College and Lyn Parade/Beech Road intersection. This road section contains a bridge over the M7 Motorway and has a carriageway width of approximately 17.8m and is separated by a 0.7m wide concrete median island.

The Committee is requested to support in principle the proposed carriageway changes as a continuation of the lane configuration for the Kurrajong Road, Lyn Parade, Beech Road intersection upgrade and as shown in the Attachments 5.1 and 5.2.

ASSESSMENT

Council is currently undertaking detailed design to upgrade the existing Kurrajong Road, Lyn Parade and Beech Road single lane roundabout to a signalised intersection. The intersection upgrade is funded under the Federal Government's Western Sydney Infrastructure Plan (WSIP).

As part of the intersection upgrade, the Kurrajong Road approaches will be widened to provide two lanes in each direction. This will include two traffic lanes approximately 200m long in each direction west of Lyn Parade/ Beech Road, to provide 3.2m wide traffic lanes and 2.1m on-road cycleway or parking bays on both sides.

The approach widening would provide 200m of a four-lane road east and west of Lyn Parade/Beech Road. The western approach widening would extend up to the existing bus shelter south of Kurrajong Road. To compliment this road upgrade, and as the carriageway can accommodate reconfiguration to extend the four-lane configuration up to Amity College.

West of this road section, for approximately 600m, up to the Amity College frontage, as indicated above, has a carriageway width of approximately 17.8m and is separated by a 0.7m wide concrete median island. A street view map of this road section is shown below.



This road section is currently line marked to operate with a single traffic lane with the following dimensions:

- **Traffic Lanes** - 3.6m wide for the westbound and 3.5m wide for the eastbound.

- **Road Shoulders** - 4.7m wide for the westbound direction and 5.1m wide for the eastbound direction. These road shoulders are marked with bicycle marking to permit cycling and parking.
- **Shared Path** - There is an existing shared path on the southern side but no footpath on the northern side.

Proposed Lane Modifications

Eastbound Carriageway Configuration:

- Two traffic lanes and arrangement to maintain cycleway (this is to be achieved by a combination of shared cycleway and parking).
- Amity College driveway to M7 Motorway cycleway loop, approx. 34m, on-road shared path to be retained.

Westbound Carriageway Configuration:

- Two traffic lanes, remove bicycle markings in the road shoulder and mark the existing shared path to highlight its use as such.
- Arrangement to permit on-street parking from the existing bus zone to the M7 Motorway cycle loop.

This road section has M7 Motorway cycle way loop under the bridge which is separated by a guard rail. The road section contains a 60m bridge over the M7 Motorway which is a TfNSW/M7 Westlink asset. Hence, consultation with TfNSW/M7 Westlink is required before the above changes can be carried out.

As an interim arrangement, before the Kurrajong Road, Lyn parade, Beech Road intersection upgrade is carried out, lane modification to permit westbound parking can be undertaken. In addition, detailed survey and design is required to confirm the traffic lanes and parking bay dimensions that can be achieved.

Detailed design of the proposed carriageway modification will be prepared, arrangement will be prepared in consultation with TfNSW and presented to a future LTC meeting, for further consideration.

When traffic volumes warrant further upgrade west of the Amity College frontage, the existing marked pedestrian crossing would need to be upgraded to a signalised intersection to permit lane reconfiguration for a four-lane road at the Kurrajong Road/ San Marino Drive intersection.

RECOMMENDATION

That the Committee supports in principle:

- The proposed carriageway changes as a continuation of the lane configuration for the Kurrajong Road, Lyn Parade, Beech Road intersection upgrade and as shown in the Attachments 5.1 and 5.2.
- Detailed design of the revised lane configuration to be prepared in consultation with TfNSW and M7 Westlink.
- Council to submit the detailed design to the committee at a future meeting for further consideration.

COMMITTEE DISCUSSION

The Interline representative reported that their bus services experiences delays during student pick up, this is due to increasing U-turn movements at the Kurrajong Road/ San Marino Drive intersection and enquired whether most of the pickup and set down can happen within the school.

The Committee discussed and noted that the school has off-street parking within the school, however not all parents use the off-street parking. Council would discuss with the school arrangement that would encourage parents to use the off-street car park.

The Committee discussed and supported in-principle, the four-lane road configuration from Kurrajong Road to the school frontage for a detailed design to be presented at a future Committee meeting.

COMMITTEE RECOMMENDATION

That the Committee supports in principle:

- The proposed carriageway changes as a continuation of the lane configuration for the Kurrajong Road, Lyn Parade, Beech Road intersection upgrade and as shown in the Attachments 5.1 and 5.2.
- Detailed design of the revised lane configuration to be prepared in consultation with TfNSW and M7 Westlink.
- Council to submit the detailed design to the committee at a future meeting for further consideration.

ITEM 6**Lismore Street, Hoxton Park – Request for Improved Traffic Conditions****INTRODUCTION**

At the 21 September 2022 meeting, the Committee considered a report on traffic conditions along Lismore Street and recommended that the conditions be monitored, and options investigated to reduce through traffic along the road.

Since then, Council has been receiving concerns and representations about road safety along the street, including information on a child being knocked down by a vehicle walking home.

The residents are requesting Council to implement an interim treatment and for the other treatment to minimise through traffic. To address the speeding concern and discourage through traffic, a speed hump is proposed mid-way across the street at an existing narrow road section.

Design of the proposed speed hump and entry kerb blister is as shown in Attachment 6.1. The Committee is requested to support the proposed speed hump.

ASSESSMENT

Lismore Street is predominantly an east/west local street providing access to residential properties on both sides. It is close to two schools and is being used by through traffic heading towards First Avenue then to Hoxton Park Road and beyond.

The street is approximately 215m long, has the following two carriageway widths:

- Eastern and western section - approximately 7.3m and
- Middle section - approximately 9.2m, including approximately 2m indented parking bays on the northern side.

Speed classification carried out last year indicated that the street is carrying a daily average traffic volume of 5925 vehicles with 85th percentile speed of 48km/h (within the 50km/h applicable speed limit).

With this speed profile, at the previous meeting, the Traffic Committee did not consider that speed hump/s are required. The Police was requested to continue their speeding enforcement and provide update to the Committee at future meetings.

The complaints Council has been receiving include concerns that there are increasing minor crashes that are not reported to the Police, pedestrians feel unsafe walking along or crossing the street and the residents have been requesting treatments to address their concerns.

In accordance with the TfNSW Guide to Generating Traffic Developments the traffic volume exceeds the desirable environmental capacity of such a local street. Hence, treatments are required to reduce the through traffic, reduce speed and improve residential amenity.

To increase residential amenity and address these concerns, a cost-effective solution involves installation of a speed hump at the narrowed mid-block location as shown below.



The street is a bus route, the speed hump requires a height of approximately 75mm. In addition, to reduce entry speed from Pacific Palms Circuit, a kerb blister is also proposed at its intersection with Lismore Street.

These treatments would not significantly reduce through traffic along Lismore Street and a solution involving possible reopening of the closed intersection between Nineteenth Avenue and First Avenue is being investigated. A layout of such an opening to permit southbound traffic, from First Avenue to Nineteenth Avenue is as shown in Attachment 6.2.

Community consultation would be carried out on the layout and the outcome of the consultation would be reported at a future meeting for further consideration.

RECOMMENDATION

That the Traffic Committee supports:

- Proposed speed hump and entry kerb blister in Lismore Street as shown in Attachment 6.1.
- Council to undertake community consultation with local residents on possible reopening of First Avenue/Nineteenth Avenue intersection as shown in Attachment 6.2.

COMMITTEE DISCUSSION

The Committee was advised of the local residents increasing concerns about the through traffic movements along Lismore Street and the request for changes to minimise the through traffic and improve road safety.

The Committee discussed and supported the proposed speed hump as an interim arrangement to discourage the through traffic, reduce traffic speed and improve safety along the street.

In addition, the Committee noted that Council would undertake community consultation on the possible reopening of First Avenue/Nineteenth Avenue intersection over the next two months for the outcome of the consultation to be presented to a future Traffic Committee Meeting.

The TfNSW representative requested that the design of the proposed entry treatment at the Lismore Street/ Pacific Palms Circuit intersection should accommodate the turning path of a bus as Lismore Street is a bus route.

A copy of the detailed design showing turning paths would be submitted to TfNSW prior to installation.

COMMITTEE RECOMMENDATION

That the Traffic Committee supports:

- Proposed speed hump and entry kerb blister in Lismore Street as shown in Attachment 6.1.
- Council to undertake community consultation with local residents on possible reopening of First Avenue/Nineteenth Avenue intersection as shown in Attachment 6.2.
- A copy of the detailed design be submitted to TfNSW for review prior to installation.

ITEM 7**Henderson Road, Edmondson Park – Request for Installation of Indented Parking Bays****INTRODUCTION**

Council has received a proposal from Frasers Property to construct 11 indented parking bays with 1/2P restrictions along the section of Henderson Road between Soldiers Parade and Sergeant Street, Edmondson Park.

The indented parking bays would permit short term parking and pick up and set down, along the section of Henderson Road, fronting the Edmondson Park Square Shopping Centre.

Design of the indented parking bays have been prepared in accordance with the TfNSW guidelines. The Committee is requested to support the proposed indented parking bays and associated signs and line markings as shown in Attachment 7.

ASSESSMENT

Henderson Road is an east-west local road between Soldiers Parade and McDonald Road, along the southern side of the Edmondson Park Station, northern side of the Ed Square Shopping Centre and a recently completed commuter carpark, south of the station.

Henderson Road is a bus route and provides access to the adjoining developments and commuter carpark.

Henderson Road has a signalised intersection with Soldiers Parade and a roundabout at the McDonald Road intersection and a T-intersection with Sergeant Street. A locality map showing the street is as shown below.



The section of Henderson Road between Soldiers Parade and Sergeant Street, Edmondson Park has a carriageway width of approximately 12.1m line marked to provide a single traffic lane in each direction of approximately 4.5m wide and a bus bay along the northern side of approximately 3.1m wide. The southern section has a relatively wide urban domain area approximately 9.8m wide.

Frasers Property owns and manages the Ed Square Shopping Centre and has submitted a proposal to convert a 2.1m wide portion of the urban domain area to 11 indented parking bays with 1/2P parking restrictions. This would reduce the existing urban domain area to 5.7m. The proposal will also require removal of seven healthy trees. The company has advised that these trees would be replaced with tree planting along Soldiers Parade to Council satisfaction.

The indented parking bays would permit short term parking and pick up and set down, along the section of Henderson Road, fronting the Edmondson Park Square Shopping Centre.

The Committee is requested to support the proposal as presented in the Attachment 7.

RECOMMENDATIONS

That the Committee supports installation of 11 indented parking bays with 1/2P restrictions along the section of Henderson Road between Soldiers Parade and Sergeant Street as shown in Attachment 7.

COMMITTEE DISCUSSION

Councillor Harle raised a concern that the proposed indented parking bays requires the removal of a number of trees. To minimise the tree removal, the bays are to be redesigned to retain some of the trees within the carriageway and within planter boxes on the public domain.

In addition, the Interline represented expressed concern about pick up and set down within the bus zone and requested that the proposed indented parking bays could include short term parking to be used for kiss and drop i.e., No Parking or 1/4P parking.

The Committee discussed and supported a revised indented bay parking arrangement including one or two kiss and drop parking arrangement.

COMMITTEE RECOMMENDATION

The Committee supports a revised indented bay parking arrangement retaining two or three trees within the road carriageway and two kiss and drop spaces and planter boxes along the section of Henderson Road between Soldiers Parade and Sergeant Street.

ITEM 8	Hill Road, Lurnea – Review of Parking Arrangement and Request for Ambulance Parking Space
--------	---

INTRODUCTION

The Committee at its March 2023 meeting considered a General Business Item 5, which related to relocation of a bus stop in front of House No. 50 Hill Road, by approximately 5m to the previously approved location north of the driveway.

At its Ordinary meeting on 26 April 2023, Council resolved that the parking arrangement in front of House No. 50 and the adjoining property at House No. 52, a medical centre be resubmitted to the Committee for review.

As part of the review, Council has received correspondence for ambulance parking space to be considered near the front of the medical centre.

The Committee is requested to review the parking arrangement and, if deemed necessary, support installation of an ambulance parking space near the front of the medical centre.

ASSESSMENT

The General Business Item 5 of the March 2023 LTC meeting involved a representation Council received from the occupant of the barber shop at House No. 50 Hill Road, for a bus stop sign relocated to the southern side of his driveway by approximately 5m to be relocated to the previously approved location north of the driveway. A locality map of the road section is shown below.



As outlined in the Committee agenda, a Transport for New South Wales (TfNSW) contractor relocated the bus stop as part of a roll out, the agency is currently undertaking to install similar bus stops signs at all approved bus stops in the Sydney metropolitan area instead of the practice which required local bus operators to install bus signs.

The TfNSW Project Manager did not consult Council or the LTC before the relocation and has since agreed that LTC approval was required to re-locate the bus stop and hence has no objection for relocation to its previously approved location.

The LTC approved the bus stop within a bus zone in consultation with the affected occupants of House Nos 48 and 50 Hill Road. The bus stop location does not effect on-street parking along the adjacent Medical Centre property at Property No 52 Hill Road frontage.

House No. 50 Hill Road and the medical centre, have driveways off Hill Road, approximately 23m apart, which can accommodate three on-street parking spaces. The road space and permitted parking spaces are unrestricted and not allocated. The barber shop has no priority to occupy these spaces.

The owner of House No. 48 Hill Road requested Council and LTC about four years ago to install the bus zone across her property frontage and has no objection to approved and existing parking arrangements.

The driveway to the medical centre has existing No Stopping restriction of approximately 4m north of the driveway, this provides opportunity for exiting vehicles to be able to see oncoming traffic and exit safely. The existing and proposed parking arrangement is as attached in Attachments 8.1 and 8.2.

The medical centre driveway arrangement consists of a combined entry and exit entry driveway of approximately 5.3m wide and No Stopping zone of approximately 31.5m south of the existing pedestrian crossing across the road section adjacent to the local neighbourhood shops. A portion of this No Stopping zone can be signposted as Ambulance Space, if required. This will be in consultation with the medical centre.

RECOMMENDATIONS

That the Committee discuss and, if deemed necessary, support installation of an ambulance parking space near the front of the medical centre as shown in Attachment 8.2.

COMMITTEE DISCUSSION

Councillor Harle indicated while that there is a 4m No Stopping zone between the unrestricted parking and the driveway to the medical centre, there is a concern about visibility of exit movements from the medical centre as traffic along Hill Road tends to travel at approximately 60km/h (along the signposted 50km/h speed limit).

Hence, he suggested that the No Stopping zone be increased to approximately 8m to permit two parking spaces between House No. 50 and the medical centre.

The Committee discussed and noted that Council would investigate speeding along Hill Road (close to the medical centre) to assess whether traffic calming device is required to improve safety of the exit movements from the medical centre. At this stage, the current parking arrangement would be monitored as part of this investigation.

COMMITTEE RECOMMENDATION

The Committee noted that Council would investigate speeding along Hill Road to assess whether traffic calming device is required to reduce speed and improve safety of the exit movements from the medical centre.

ITEM 9	Request for Indented Parking Bays Along Sections of Esk Avenue and Brunswick Heads Crescent, Hoxton Park
---------------	---

INTRODUCTION

Council has been receiving representations from residents of Esk Avenue and Brunswick Head Crescent concerning increasing parking along both sides of the streets, which are affecting safe and convenient traffic movements.

The two streets have relatively narrow carriageways and on-street parking along both sides affect traffic flow. To address these concerns, the residents have requested Council to investigate installation of parking restrictions or indented parking bays.

The two streets have road reserves which would accommodate indented parking bays to be installed along one or both sides of the streets as shown in Attachments 9.1 and 9.2.

The Committee is requested to support the design layout for the construction of the indented parking bays.

ASSESSMENT

A description of the two streets and the parking concerns are as follows:

Brunswick Head Crescent

Brunswick Head Crescent is a No Through Road approximately 150m long and has a carriageway width of approximately 5.4m. Therefore, the street can only safely accommodate two-way traffic lanes, a single traffic lane and parking on one side, or staggered parking on both sides with a single traffic lane.

The street is close to Malek Fahd school, attracts parking during school pickup and drop off periods which affects safe two-way traffic, leading to traffic congestion and affects access to the adjoining residential properties. Hence, Council has received request to investigate installation of 'No Stopping' restrictions during school pick up and drop off periods.

The road alignment has a curved road section and parking within this section affects sight distance, a cost-effective solution involves installation of 'No Stopping' signs along the southern and eastern section of the street, in front of House Nos. 1 – 7 Brunswick Head Crescent, as indicated in the locality map on the next page.

The affected residents would be consulted prior to installation of the recommended 'No Stopping' restriction. As a medium-term solution, the street would be added to Council's priority list for the design of indented parking bays when funding becomes available.



Esk Avenue

Esk Avenue is a local minor road between Eva Avenue and Whitsunday Circuit, approximately 450m long and has carriageway width of approximately 7.8m. A section of Esk Avenue includes a No Through Road approximately 30m long, which has a carriageway width of approximately 5.8m. A locality map of this road section is as indicated below.



The concerns Council has received relates to this short road section. The concerns include on-street parking along both sides of the street, which restricts through traffic and the Police had to be called to advise the residents to ensure access to the adjoining properties are not blocked.

The eastern section of the street has kerb and guttering and could be signposted to restrict parking, however this requires community consultation and the resident's support. The residents have requested Council to consider installation of indented parking along sections of the street.

The existing road reserve can accommodate approximately 4 indented car parking spaces, subject to consultation with the adjoining property owners. Indicative locations are shown in the image above.

As a medium-term solution, the street would be added to Council's priority list for the design and installation of indented parking bays when funding becomes available.

RECOMMENDATIONS

That the Committee supports:

- Installation of 'No Stopping' signs (R5-404) along the southern and eastern sections during school periods, in front of House Nos. 1 – 7 Brunswick Head Crescent.
- Both streets to be added to Council's Priority list for the design of indented parking bays when funding becomes available.

COMMITTEE DISCUSSION

The Committee was advised of the background including representation from the Member of Leppington on the impact of on-street parking along Brunswick Head Crescent. The Members representative agreed with the recommendation to install parking restrictions along the southern and eastern sections during school periods, in front of House Nos. 1 – 7 Brunswick Head Crescent.

COMMITTEE RECOMMENDATION

The Committee supports:

- Installation of 'No Stopping' signs (R5-404) along the southern and eastern sections during school periods, in front of House Nos. 1 – 7 Brunswick Head Crescent.
- Both streets to be added to Council's Priority list for the design of indented parking bays when funding becomes available.

ITEM 10	Cecil Hills High School, Cecil Hills – Proposed Traffic Management Changes
----------------	---

INTRODUCTION

At its March 2023 meeting, the Committee considered a report on Cecil Hills High School proposed school expansion, with associated proposed traffic management changes along sections of Frederick Road along the school.

NSW School Infrastructure is project managing the school expansion. The changes included a second marked pedestrian crossing across Frederick Road. The Committee expressed concerns about the traffic impact on these changes and requested additional information and revised design layout from NSW School Infrastructure.

The NSW School Infrastructure consultants have submitted revised drawings, as requested. The Committee is requested to support the proposed traffic management changes as indicated in Attachments 10.1 and 10.2.

ASSESSMENT

As outlined in the March LTC Agenda, NSW School Infrastructure (NSWSI) is proposing to increase the student population of Cecil Hills High School from 1,453 students (2021 enrolment year) to a total capacity of 2,000 students. The growth in student numbers will support the projected growth within the school's catchment area, resulting from the Western Sydney Aerotropolis development in Badgerys Creek.

As part of the school expansion, a new school entrance is proposed on Frederick Road. As a result, the school has proposed the following changes to facilitate its new access arrangements, which include:

- New pedestrian crossing on Frederick Road and associated signage and linemarking plan.
- Proposed pedestrian fence along Frederick Road.
- Formalised bus zones along Frederick Road.
- New 120 m Kiss-and-Drop zone along Frederick Road, and
- Proposed No stopping zone on Spencer Road.

At the March LTC meeting, NSW School Infrastructure project team attended the meeting and gave a presentation on the proposed school expansion.

The Committee discussed and raised concerns about possible traffic impacts of the proposed second pedestrian crossing and increased kiss-and-drop activity along the section of Frederick Road, fronting the school, including the following:

- The proposed second crossing is approximately 160m east of the existing marked pedestrian crossing. This could result in noticeable traffic delay along the section of Frederick Road between the two crossings, which would need to be narrowed to a single lane in each direction.

- With the increase in student numbers, there will be increased kiss-and-drop along Frederick Road and Spencer Street and School Infrastructure is to consider the construction of off-street parking in the vacant lane within the school boundary.
- The second crossing would require the 160m between the two crossings to operate with a single lane in each direction. This reduces the road capacity and could lead to further congestion.

The NSWSI consultants have provided information that whilst the second pedestrian crossing would increase traffic delay along the section of Frederick Road fronting the school, the delays would not be much higher than traffic delay during school pick up and set down times.

In addition, the consultants have outlined that a pedestrian desired line will be established across the section of Spencer Road where the crossing is proposed. Without a marked crossing, the high school students are likely to cross the road section, uncontrolled, which could also lead to road safety concerns.

The second marked pedestrian crossing would effectively reduce the current two lanes in each direction along the section of Frederick Road fronting the school to a single lane in each direction. The NSWSI consultants have advised that the single lane should not lead to excessive congestion.

However, NSW School Infrastructure has been advised that the traffic conditions would need to be monitored for the next two years or as the school reaches the projected maximum population or whether the second crossing needs to be replaced with a signalised pedestrian crossing to ensure that the road section can operate with two lanes in each direction. Should this be required, NSWSI is to be required to fund the required upgrade.

In addition, the Committee raised concern about the adequacy of the proposed on-street kiss and drop zone, with a request for NSWSI to investigate such parking within the school. The information provided does not include assessment or provision of the requested on-site parking.

The Committee's recommendation could include a requirement for such off-street parking to be provided as the school population increases. The submitted drawings requires Council and TfNSW review.

The Committee is requested to consider and support in-principle, the proposed second pedestrian crossing and associated signs and line marking for TfNSW and Council to review and provide comments to the consultant to amend the layouts prior to implementation.

RECOMMENDATIONS

That the Committee to support in-principle, the proposed second pedestrian crossing and associated signs and line marking for TfNSW and Council to review and provide comments to the consultant to amend the layouts prior to implementation.

COMMITTEE DISCUSSION

NSWSI representatives, including a Stantec traffic consultant, provided a presentation on the traffic impacts of the proposed school expansion with SIDRA modelling and proposed second pedestrian crossing and increased kiss-and-drop zone along the section of Frederick Road, fronting the school.

The presentation included SIDRA modelling outputs which the consultant outlined indicated the second pedestrian crossing is not forecasted to delay traffic movements significantly. MA indicated that there is existing traffic queue at the Frederick Road, Feodore Drive and Spencer Road roundabout and that the proposed expansion could increase the queuing.

The NSWSI representative indicated that the school expansion is now forecasted to increase from the current 1402 student to 1423 by 2028 and 1452 by 2033 (i.e. the forecast increase would be by approximately 50 students in 10 years). Hence, the increase is not expected to change traffic conditions significantly.

The representatives also indicated that they are not able to provide off-street parking within the school, as Council requested at the previous meeting. This is because the slope of the land, a transmission line and the proposed additional building would not leave room for such parking to be provided.

The TfNSW representative provided advice that the signs and line marking plans submitted needs to be revised to ensure that the road section of Frederick Road, fronting the school, operates with a single lane in each direction as a result of the proposed raised marked crossing.

CW added that to ensure traffic flow along the section of Frederick Road fronting the development is not worsened, Council would monitor and review traffic conditions a year after the second pedestrian crossing is installed and if required, NSWSI will be requested to upgrade the crossing to a facility that would improve traffic flow.

COMMITTEE RECOMMENDATION

That the Committee to support in-principle, the proposed second pedestrian crossing and associated signs and line marking for TfNSW and Council to review and provide comments NSWSI to amend the traffic facility design drawings and resubmit to Council for approval.

ITEM 11	Items Approved Under Delegated Authority
----------------	---

INTRODUCTION

This item provides a summary of minor traffic facilities that have been approved under the Liverpool Local Traffic Committee Delegated Authority by TfNSW and Police representatives over the two-month period, between April 2023 and May 2023.

Delegated Authority No.	Location	Description of Proposal
2023.012	Bigge St, Liverpool	No Stopping signs
2023.013	Buchan Ave/Bezentin Ridge Rd, Edmondson Park	No Stopping signs
2023.014	Ryeland Street, Miller	No Stopping signs
2023.015	335 Fifteenth Avenue, Austral	Subdivision (TF-28/2022)
2023.016	35-45 Eighth Avenue, Austral	Subdivision (TF-4/2023)
2023.017	238 Hoxton Park Road, Prestons	Proposed Warehouse (TF-6/2023)
2023.018	226-228 Newbridge Road, Moorebank	Proposed Service Station (TF-8/2023)
2023.019	65 Tenth Avenue, Austral	Subdivision (TF-10/2023)
2023.020	11 Iraking Avenue, Moorebank	Proposed Warehouse (WZ-2/2023)
2023.021	52 Soldiers Parade, Edmondson Park	Work Zone - Proposed Town Centre Building (WZ-3/2023)
2023.022	Cressbrook Drive, Wattle Grove	Timed No Stopping signs
2023.023	Railway Street, Liverpool	10 minute parking signs
2023.023A	Clyde Avenue, Moorebank	Centre and Edge line marking
2023.024	Yarrunga Street, Prestons	No Stopping signs
2023.025	Yato Road, Prestons	No Stopping signs and Line marking
2023.026	Vinny Road, Edmondson Park	2 x speed humps

RECOMMENDATION

That the Committee notes the above Delegated Authority applications approved by the NSW Police Force and TfNSW representatives over the two-month period between April 2023 and May 2023.

COMMITTEE DISCUSSION

The Committee noted the above Delegated Authority applications approved by the NSW Police Force and TfNSW representatives over the two-month period between April 2023 and May 2023.

COMMITTEE RECOMMENDATION

The Committee notes the above Delegated Authority applications approved by the NSW Police Force and TfNSW representatives over the two-month period between April 2023 and May 2023.

TECHNICAL DISCUSSION

TD1	Manning Street, Warwick Farm – Request for Horse Crossing Facility
------------	---

INTRODUCTION

The Committee at the September 2021 meeting requested to investigate to improve safety of horse movements across sections of Manning Street, Warwick Farm. Subsequent, Council officers met a horse trainer and it was decided to undertake traffic survey to horse movements across Manning Street prior to undertaking traffic management improving horse safety.

The Committee is requested to note the traffic survey details and to discuss options to address horse safety in Manning Street, Warwick Farm.

ASSESSMENT

Council has been receiving number of concerns from horse trainers that during the morning (3.30am-9am) and afternoon (1.30pm-4pm) peak period number of horses crossing Manning Street, Warwick Farm.

Manning Street is a north-south road with approximately nine stables on the west side adjacent to the railway line.

In April 2023, traffic survey was undertaken between 3am and 9am and the results are summarised below:

1. Horse activity commences approximately at 3.30am and continue till 8.30am.
2. A total of 205 horses were seen crossing Manning Street between 3.30am and 8.30am.
3. Heavy vehicle movement is less than 10 veh/hr till 5am and thereafter it started increasing steadily to reach maximum of 134 veh/hr by 9am.
4. Traffic during the morning peak period ending 8.15am is 70 northbound vehicles and 367 southbound vehicles.
5. Most of the horses were crossing Manning Street at National Street intersection.
6. Number pf pedestrians were observed walking on the carriageway.
7. Existing street light is adequate at the Manning Street and National Street intersection.

Keeping in view of the traffic survey the following options are suggested:

1. Marked pedestrian crossing at the Manning Street and National Street intersection. During the peak period ending 8.15am indicates 70 vehicles (40% being heavy vehicles) and 8 pedestrian in the northbound direction and 367 vehicles (9% being heavy vehicles) and 9 pedestrians in the southbound direction. During this period 58 horses + pedestrian crossed Manning Street at the National Street intersection.

It is suggested to apply reduced warrant, applicable near schools, at this location because of vulnerability to the equine movements and provide marked pedestrian crossing at Manning Street and National Street intersection.

2. Midblock traffic signals to assist horses to cross Manning Street in bunches and to reduce conflict with traffic. Midblock traffic signals can also assist jay walking along the street and not to concentrate at the intersection.

This can be trialled using portable traffic signals for at least three months and be made a permanent after getting community support. Permanent signals may require Council to install and manage in the absence of TfNSW support.

RECOMMENDATIONS

Item for discussion.

COMMITTEE DISCUSSION

The Chairperson indicated that the traffic signal control arrangement could provide safe crossing for the horse and trainers and is her preference. The Chairperson also advised that horses may get frightened by additional flashing lights.

TfNSW representative outlined that previously the agency requested for additional counts of the number of horses/trainers crossing the various road sections for review to assist in identifying a possible improvement solution. Hence, as the counts have now been done, TfNSW would review and provide a response before the next Committee meeting.

COMMITTEE RECOMMENDATION

Council to provide TfNSW results of the recent counts of the number of horses and trainers crossing various road sections within the precinct for a review and the agency's response before the next meeting.

GENERAL BUSINESS ITEMS

ITEM	LOCATION/ISSUE	COMMENTS	COMMITTEE RECOMMENDATION
GB1	Spencer Road, Cecil Hills – Request for Raised Pedestrian Crossing	<p>Council has received representations to improve pedestrian safety across a section of Spencer Street close to the Cecil Hills Primary School.</p> <p>Spencer Road has been constructed as a divided road separated by a landscaped median island. The location in question has a gap in the median island, which is used as a pedestrian refuge as shown below.</p>  <p>The request for pedestrian improvement is because of a recent crash where two children were hit by a car. The Police have advised that a car trying to turn into Leopold Street, with queued vehicles in the kerb side lane did not see two children trying to cross Spencer Street and ran into the two children. The impact caused an open fracture to the right lower leg of one of the children, requiring ambulance assistance and transport to Westmead Childrens Hospital.</p> <p>One of the representations have questioned why this section of Spencer Road is not signposted as a 40km/h school zone. TfNSW approves and installs 40km/h school zones along road sections fronting schools. This</p>	<p>Council to investigate, in consultation with the Cecil Hills Primary School Principal to identify options to improve pedestrian safety at the gap location where the crash happened.</p> <p>A report to be presented to the July Traffic Committee Meeting for further consideration.</p>

GB2	Warwick Farm - Request for Residential Parking Scheme	<p>section of Spencer Road does not front the school. Hence, TfNSW has not installed a school zone.</p> <p>Previous assessment did not meet the warrant for a marked pedestrian crossing, and it was considered that the gap in the median island provided location for a pedestrian to cross the street in two stages.</p> <p>In response to a recent pedestrian crash, assessment will be carried out in consultation with the school to identify options to improve pedestrian safety at the gap location where the crash happened. A report will be presented to the July Traffic Committee Meeting for further consideration.</p> <p>Council has received representation from the Local Member for Liverpool, on behalf of Warwick Farm residents, for Council to consider implementation of a Residential Permit Scheme for residents in the medium density developments close to the Warwick Farm Station.</p> <p>Most of the residents in the medium density developments have off-street parking and the available road space may not be sufficient for effective implementation of a residential parking scheme.</p> <p>However, Council is aware that whilst some residents were able to park in the adjoining Warwick Farm commuter carpark, with the recent upgrade, TfNSW has installed an Opal operated gate which prevents residents from parking in the carpark. In addition, hospital staff also park along sections of the local street (close to the station and the hospital).</p> <p>A Residential Parking Scheme would need to cover streets including Hart Street, Lachlan Street, Goulburn Street, Hume Highway and Remembrance Avenue.</p> <p>This would require short term parking restriction (2P/3P) with exemptions to include residents/visitors who are issued with permits and enforcement arrangements would need to be identified.</p>	Council to assess and if the residential permit scheme can be accommodated and implemented cost effectively, recommend required parking restrictions, consult with the residents who would be affected by this arrangement and prepare a report to the Committee towards the end of the year.
-----	---	---	---

GB3	Slow Down To 50km/h Road Safety Campaign	<p>Council would assess and consult with the residents who would be affected by this arrangement and prepare a report to the Committee towards the end of the year.</p> <p>As part of Transport for NSW's Local Government Road Safety Funded Program, Council conducts a 'Slow Down' program to help slow traffic down in local streets. The program is supported by both Council and NSW Police.</p> <p>Council seeks the community's help to promote that the speed limit on local streets is 50km/h. Council has nominated a number of streets where residents support can be sought.</p> <p>For this year's program in April, residents along the following streets, were provided with a "Slow Down to 50" on local streets campaign package consisting of an A4 size bin sticker, letter and road safety educational DL flyer.</p> <ul style="list-style-type: none"> • Bligh Avenue, Lurnea – 89 properties • Stockton Avenue, Moorebank (between Newbridge Road and Maddecks Avenue) – 32 properties • Stockton Avenue, Moorebank (between Maddecks Avenue and Junction Road) – 40 properties • Morison Avenue, Lurnea – 62 properties • St Andrews Boulevard, Casula – 108 properties • Barcelona Drive, Prestons – 27 properties • Acacia Avenue, Prestons – 39 properties • Batehaven Cl, Prestons – 15 properties • Bird Walton Avenue, Middleton Grange – 50 properties • Heckenberg Avenue, Heckenberg – 113 properties 	The Committee noted this year's Slow Down to 50km/h road safety campaign.
-----	--	--	---

GB4	Woodlake Court, Wattle Grove – Request for a Speed Hump	<p>A copy of the "Slow Down to 50" on local streets campaign package including an A4 size bin sticker, letter and road safety educational DL flyer is shown in Attachment GB3.</p> <p>The bin stickers promoting our 'Slow down to 50' message is proving to be one of the most effective ways to captivate the attention of both locals and visitors using our roads in response to speed complaints. The stickers (long-life - durable & UV protected layer) are designed to be placed on the red garbage bins to promote and remind drivers of the speed limit and this is reinforced with a yellow reflective circle around the '50' speed limit.</p> <p>The Road Safety Team evaluate the campaign in both a quantitative and qualitative manner. Council Road Safety Officers inspect the nominated streets and count the number of stickers displayed on the bins versus the number of stickers provided in each of the nominated streets. Overall, we find most residents follow their neighbours and support the Slow Down message.</p> <p>Council's 'Slow Down to 50' campaign is also supported with continued Police enforcement.</p>	<p>Council to conduct assessment, carry out community consultation to assist in identifying possible solution and if required, report to the Committee at the July/September meeting.</p>
		<p>Council has received representation on behalf of Collie Court residents, for a speed hump to be installed on the approach to a curved section in the street to permit safe two way movement.</p> <p>The residents are concerned that particularly at night, whilst the street has a 40km/h speed limit, parked vehicles on the approach to the curved road section restricts sight distance and motorists are forced onto the other side of the road.</p> <p>At the meeting, the Committee discussed the road configuration along Collie Court, Council has since been advised that the concern relates to Woodlake Court.</p> <p>Woodlake Court is approximately 425m long with a carriageway of approximately 6.2m. The street is constructed with brick pavers, has a cul-de-sac and would not attract through traffic.</p>	

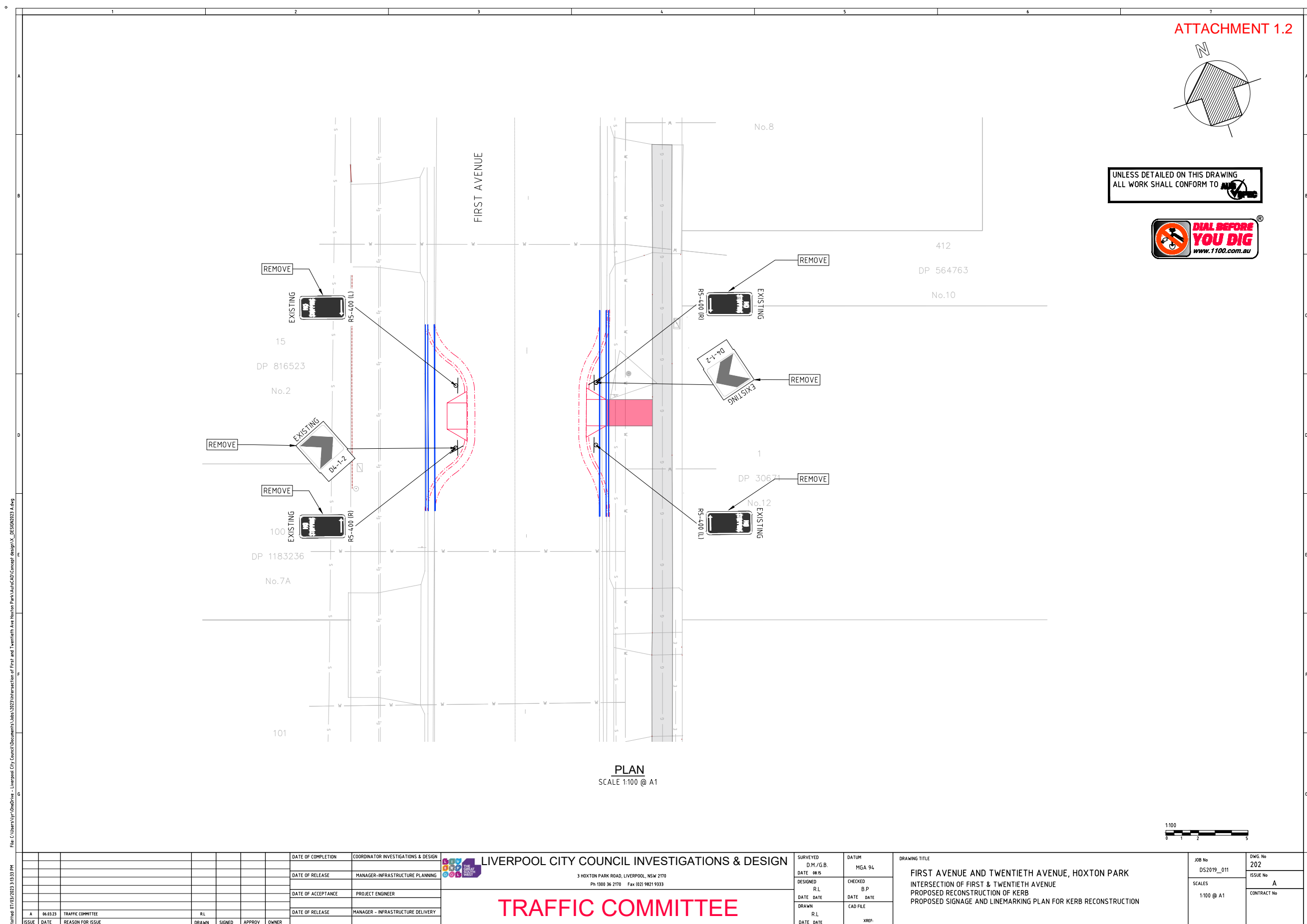
GB5	Webster Road, Lurnea - After Hour Truck Parking Concerns	<p>In response to the concern raised, assessment would be carried out to determine whether sight distance can be improved by installation of parking restriction or double barrier line marking in the curved road section.</p> <p>Parking restriction would require consultation with residents who would be affected. Identified solution could be reported to a future LTC meeting.</p> <p>Council has received representation about 10m truck parking along a section of Webster Road in front of House No. 117 Webster Road Lurnea, particularly after hours.</p> <p>In addition, Council has also received representation about truck parking after hours, causing road safety concerns at intersections including roundabouts.</p> <p>In accordance with the road rules, heavy vehicles i.e. vehicles with a GVM of more than 4.5 tonnes, are not permitted to park for more than one hour in built up areas unless signposted otherwise or carrying out delivery.</p> <p>The 10m service vehicles are permitted to park and the concerns raised would be assessed whether the parking affects access to the adjoining property for traffic flow along the road section. With regards to parking in other residential areas particularly after hours, the community standards team will be requested to consider and allocate resources for appropriate patrol and enforcement.</p>	<p>Council has assessed the parking concern in front of House No. 117 Webster Road and provided a response to the resident.</p> <p>Council's community standards team to be requested to consider and allocate resources for appropriate patrol and enforcement of truck parking in residential areas.</p>
-----	--	--	--

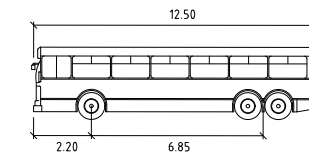
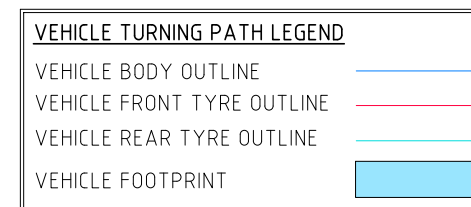
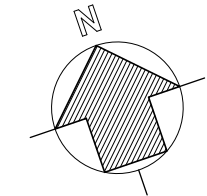


Agenda Attachments

Liverpool Local Traffic Committee Meeting Agenda Attachment Booklet of 17 May 2023







BUS	
	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

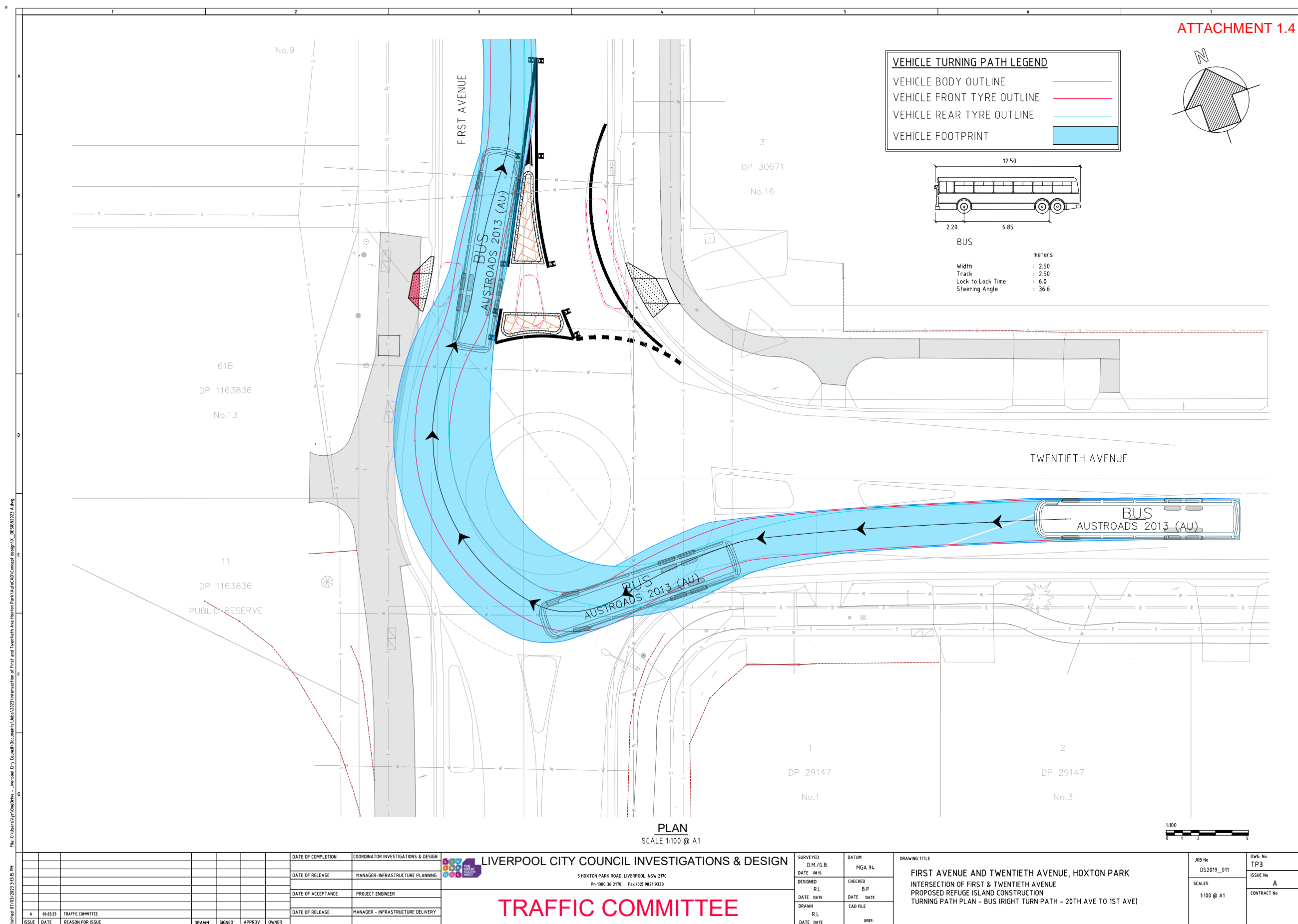
PLAN
SCALE 1:100 @ A1

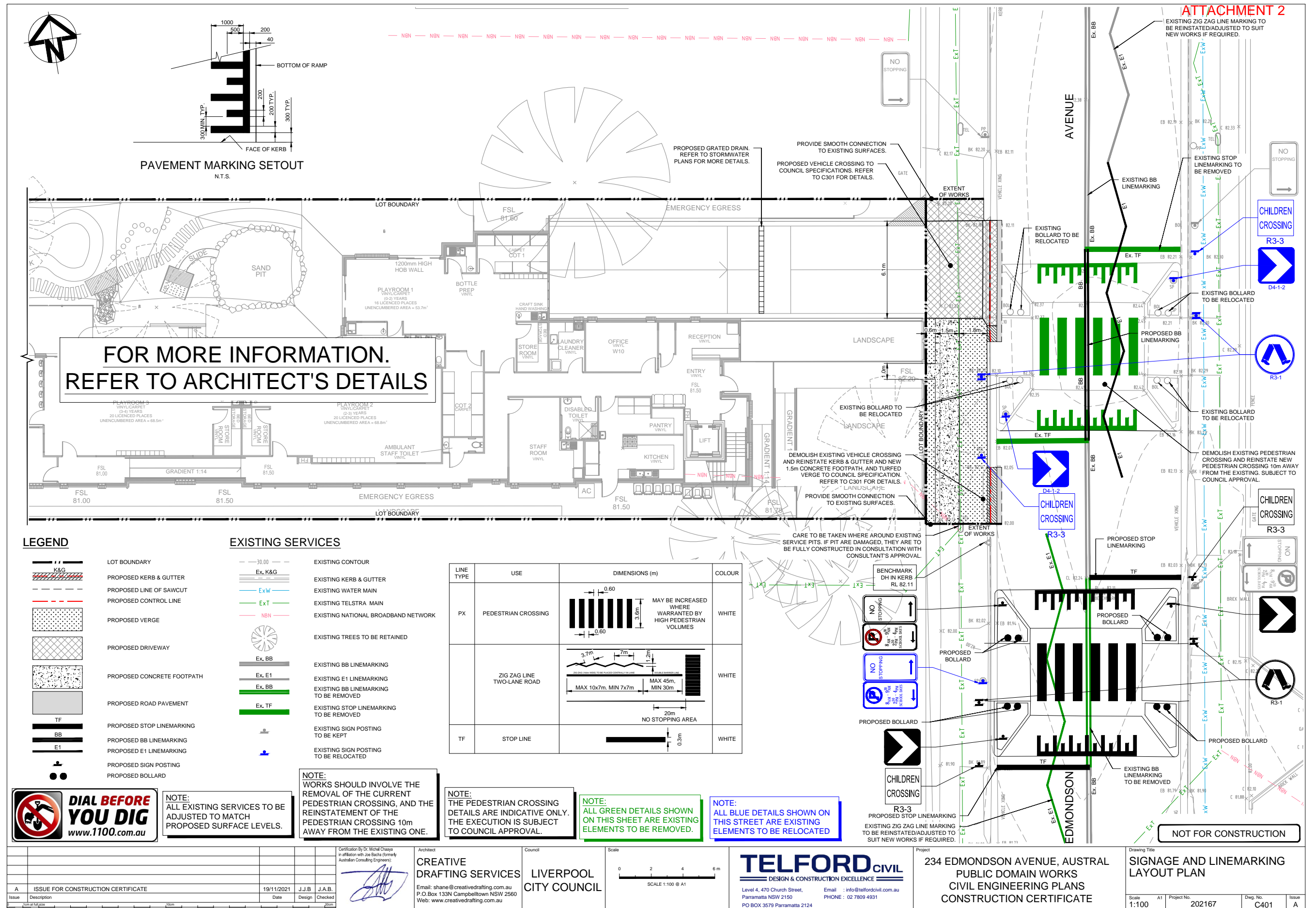
1:100



0 1 2

						DATE OF COMPLETION	COORDINATOR INVESTIGATIONS & DESIGN	 <div>LIVERPOOL CITY COUNCIL INVESTIGATIONS & DESIGN</div> <div>3 HOXTON PARK ROAD, LIVERPOOL, NSW 2170</div> <div>Ph:1300 36 2170 Fax: (02) 9821 9333</div>	SURVEYED	D.M./G.B.	DATUM	DRAWING TITLE	JOB No	DWG No
						DATE OF RELEASE	MANAGER-INFRASTRUCTURE PLANNING		DATE	MGA 94	DS2019__011		TP1	
						DATE OF ACCEPTANCE	PROJECT ENGINEER		DESIGNED	CHECKED	ISSUE No		A	
						DATE OF RELEASE	MANAGER – INFRASTRUCTURE DELIVERY		R.L.	B.P.	1:100 @ A1		CONTRACT No	
									DATE DATE	DATE DATE				
A	06/03/23	TRAFFIC COMMITTEE						DRAWN	R.L.	CAD FILE				
ISSUE	DATE	REASON FOR ISSUE	DRAWN	SIGNED	APPROV	OWNER			DATE DATE	XREF				







- PROPOSED HPAA ENTRY TREATMENT & THRESHOLD
- PROPOSED WATTS PROFILE HUMP
- EXISTING RAISED PEDESTRIAN CROSSING
- PROPOSED RAISED PEDESTRIAN CROSSING
- PROPOSED MEDIAN CLOSURE
- HPAA STUDY AREA

GENERAL NOTES:

1. THIS PLAN HAS BEEN PREPARED TO SUPPORT A TRAFFIC ASSESSMENT REPORT AND SHOULD NOT BE VIEWED WITHOUT REFERENCE TO THAT DOCUMENT.
2. THIS PLAN HAS BEEN PREPARED FROM AERIAL PHOTOGRAPHY AND THE LOCATION OF STRUCTURES AND FEATURES IS APPROXIMATE ONLY. DIMENSIONS SHOWN ARE SUBJECT TO FIELD SURVEY AND DETAILED DESIGN.



NOT FOR CONSTRUCTION



**DIAL BEFORE
YOU DIG**
www.1100.com.au

B	COUNCIL COMMENTS ADDRESSED	14/04/2023	
A	FOR CONCEPT APPROVAL	14/04/2023	
ISSUE	DETAILS	DATE	App



Traffic Planning and Environmental Consulting Pty Ltd
T(02) 4758 9927 F(02) 4758 9927 MOB 0421 782 720
Email tpeconsulting2020@gmail.com www.tpeconsulting.com.au

**LIVERPOOL
CITY
COUNCIL**

Height Datum NO DATUM		Drawn LMANN	Date 14/04/2023		Client LIVERPOOL CITY COUNCIL HPAA SCHEME MILLER CENTRAL	Job Number HPAA0XX	
Plan Azimuth APPROXIMATE M.G.A.		Surveyed	Date			Scale	Sheet 1 OF
Services		Designed LMANN	Date 14/04/2023			Drawing Number:	ISSUE B
		Approved D.DROZD	Date	Signed			

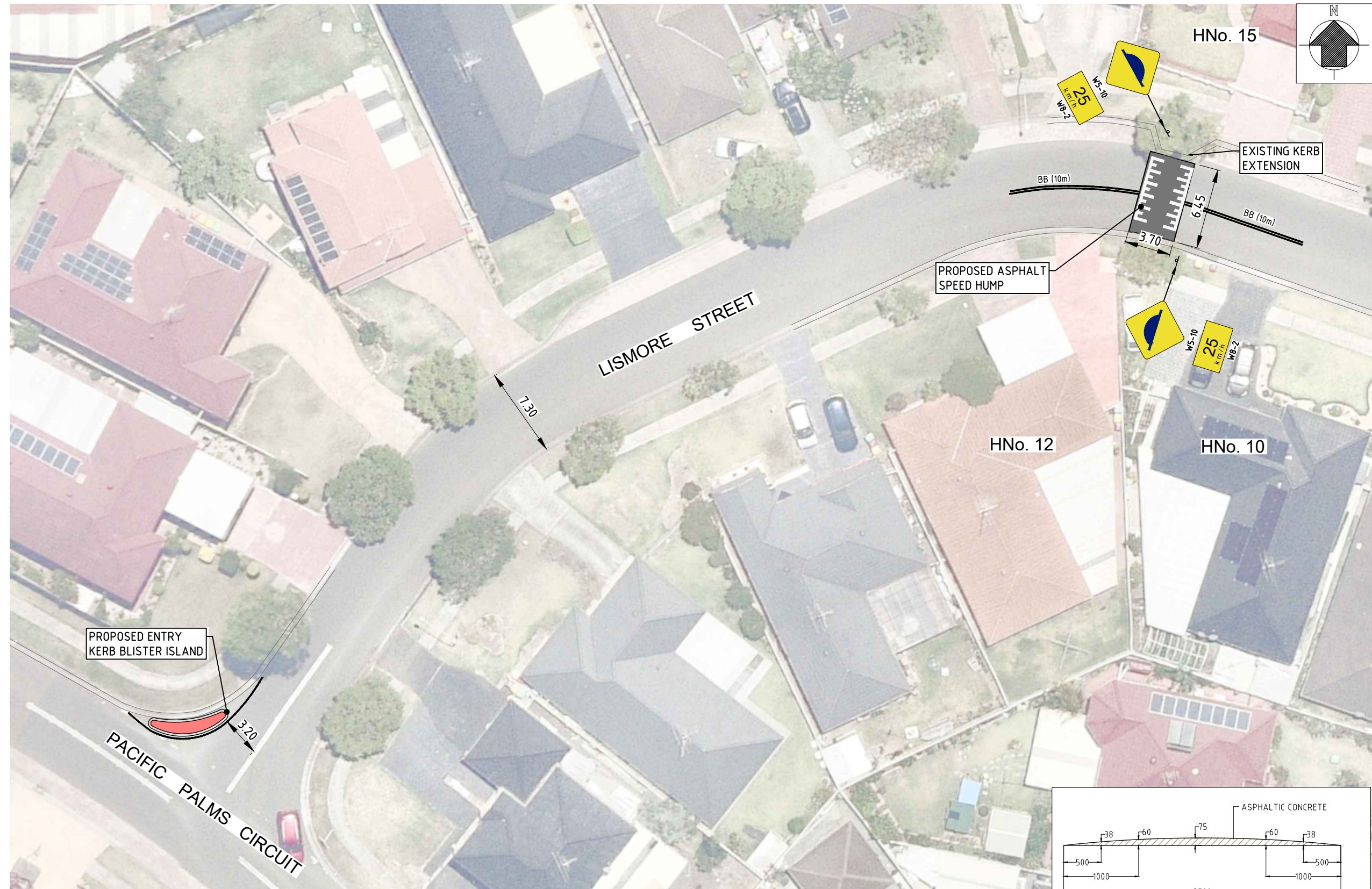


1. RAISED PEDESTRIAN CROSSING TO BE 75mm HIGH ALONG BUS ROUTE

ATTACHMENT 5



ATTACHMENT 6.1



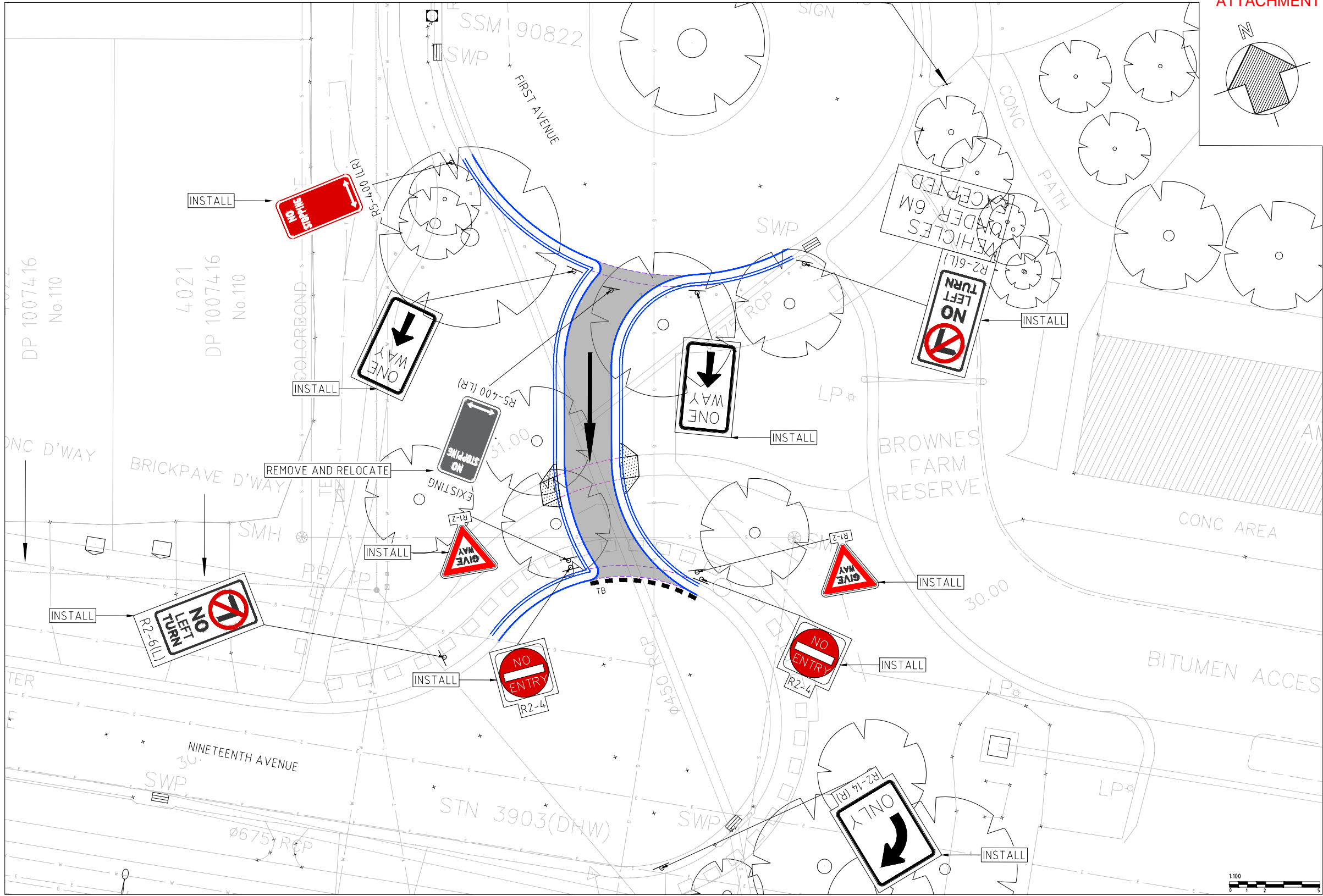
NOTE:

CONCEPT PLAN - PROPOSED SPEED HUMPS AND ENTRY KERB BLISTER ISLAND

SCALE 1:150

1. CONSTRUCT 75mm HIGH ASPHALT SPEED HUMPS FOR BUS ROUTE AS PER TYPICAL SECTION & LCC STD DWG R05

ATTACHMENT 6.2



File: C:\Users\j\My Documents - Liverpool City Council\Documents\Jobs\1223\One-way Road First and Nineteenth Avenue\1223_001.dwg

Printed: 10/05/2023 2:42:38 PM

A	DATE	TRAFFIC COMMITTEE	RL	SIGNED	APPROV	OWNER
ISSUE	DATE	REASON FOR ISSUE	DRAWN	SIGNED	APPROV	OWNER

DATE OF COMPLETION	COORDINATOR INVESTIGATIONS & DESIGN
DATE OF RELEASE	MANAGER-INFRASTRUCTURE PLANNING
DATE OF ACCEPTANCE	PROJECT ENGINEER
DATE OF RELEASE	MANAGER - INFRASTRUCTURE DELIVERY

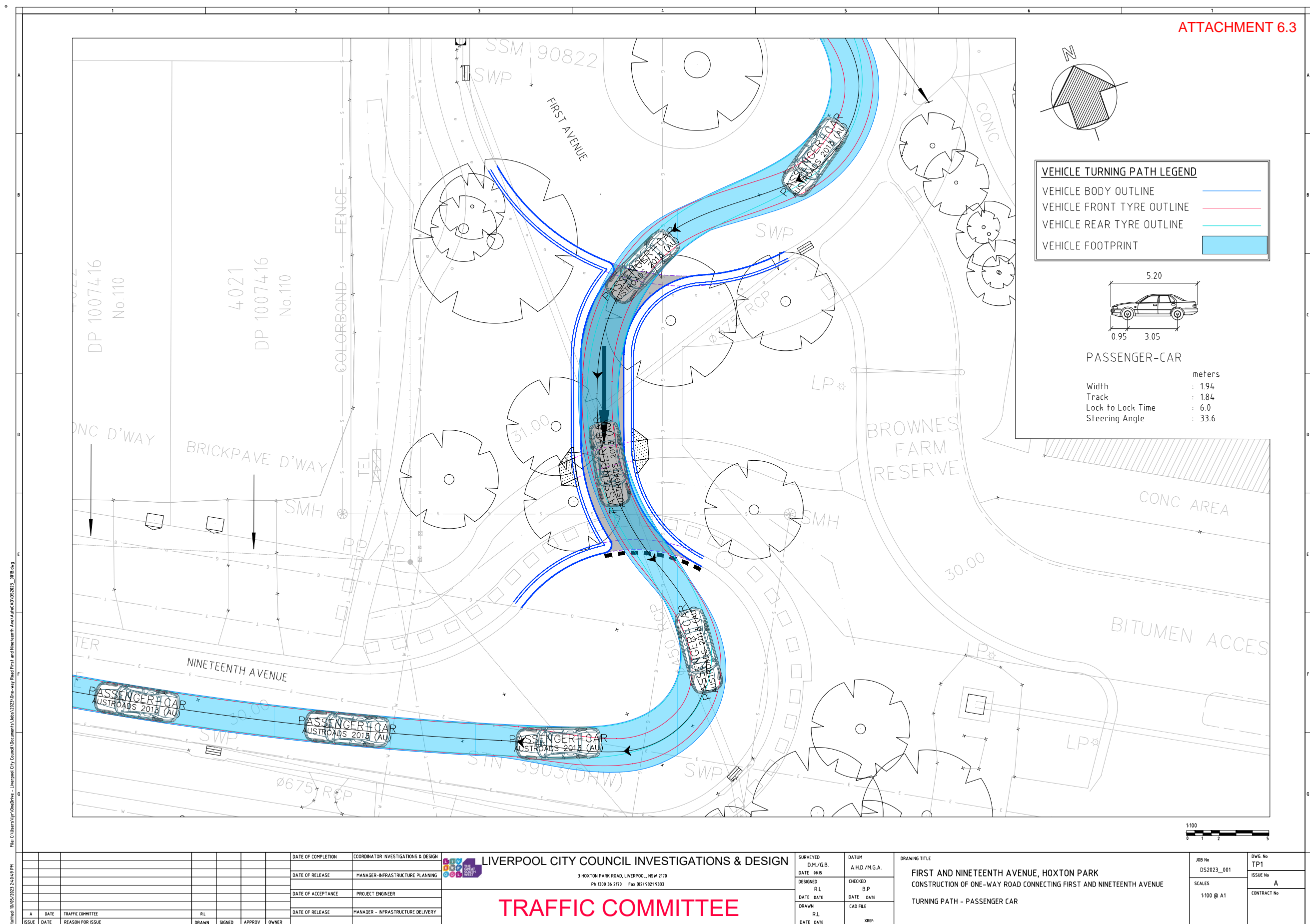
**LIVERPOOL CITY COUNCIL INVESTIGATIONS & DESIGN**
3 HOXTON PARK ROAD, LIVERPOOL, NSW 2170
Ph 1300 36 2170 Fax (02) 9821 9333

TRAFFIC COMMITTEE

SURVEYED	D.M./G.B.	DATUM	A.H.D./M.G.A.
DATE	08/16	CHECKED	B.P.
DESIGNED	R.L.	DATE	DATE
DATE	DATE	CAD FILE	
DRAWN	R.L.		
DATE	DATE	XREF:	

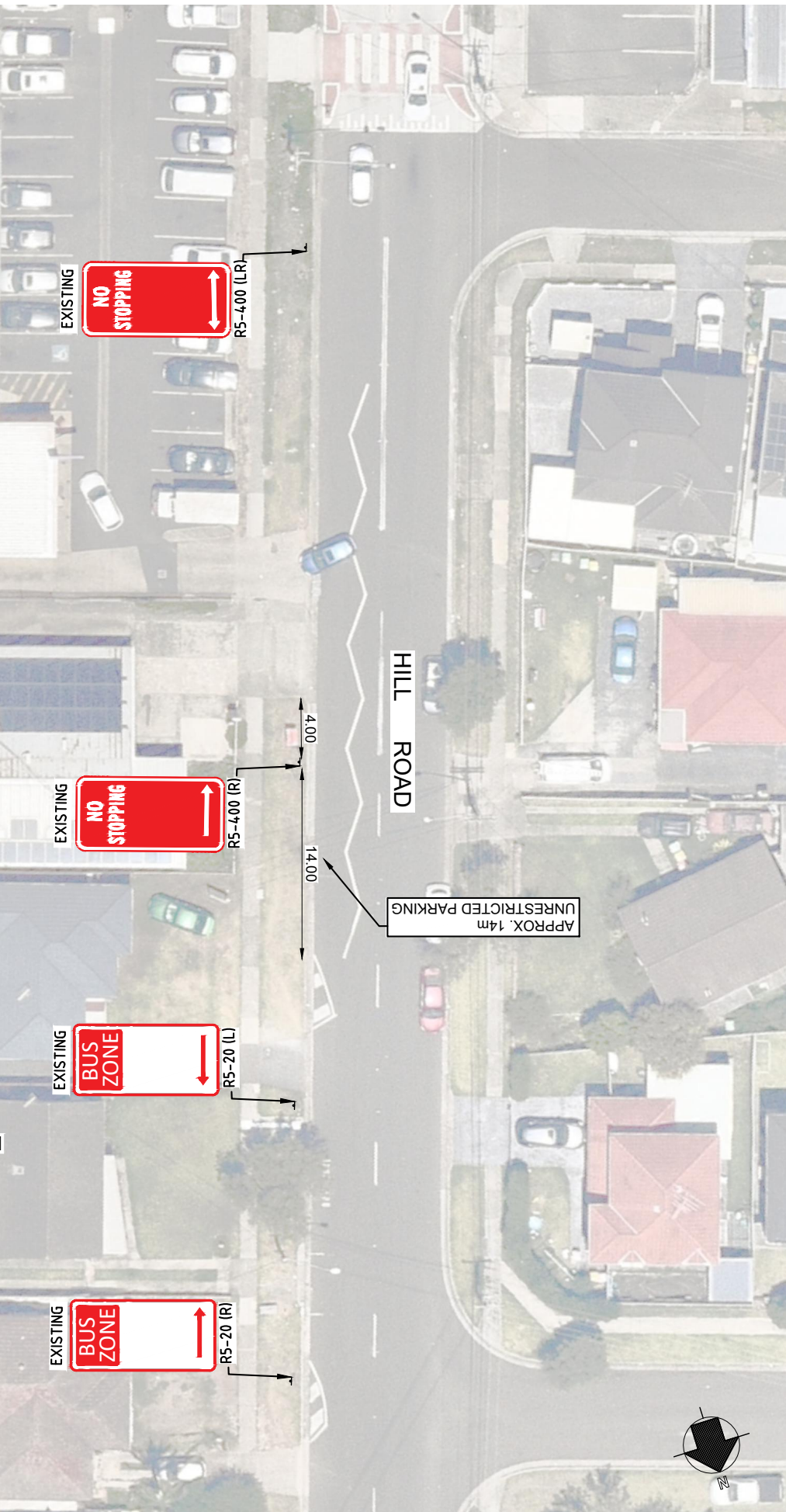
DRAWING TITLE
FIRST AND NINETEENTH AVENUE, HOXTON PARK
CONSTRUCTION OF ONE-WAY ROAD CONNECTING FIRST AND NINETEENTH AVENUE
SIGNAGE AND LINEMARKING PLAN

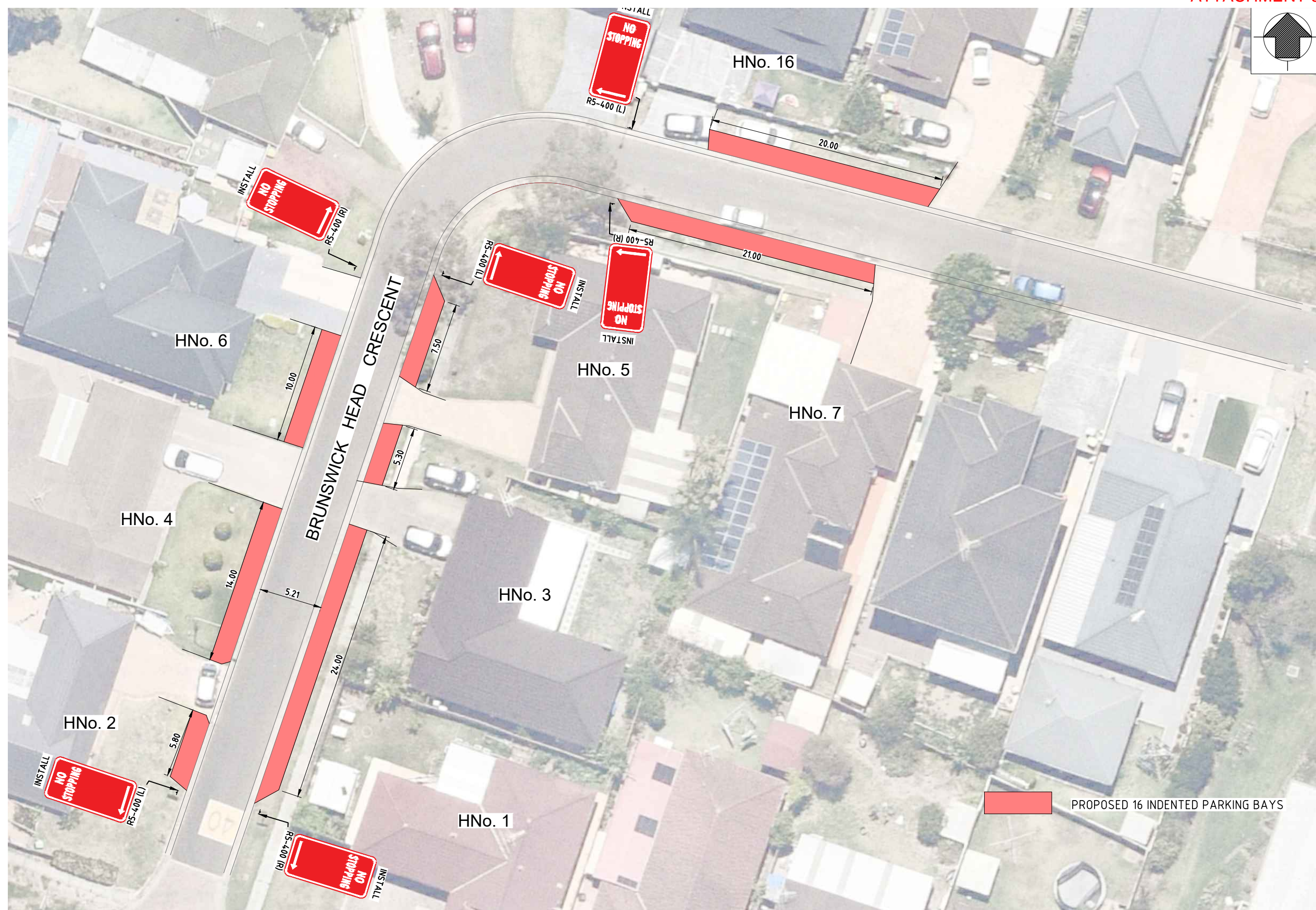
JOB No	DWG. No
DS2023_001	201
SCALE	ISSUE No
1:100 @ A1	A
	CONTRACT No





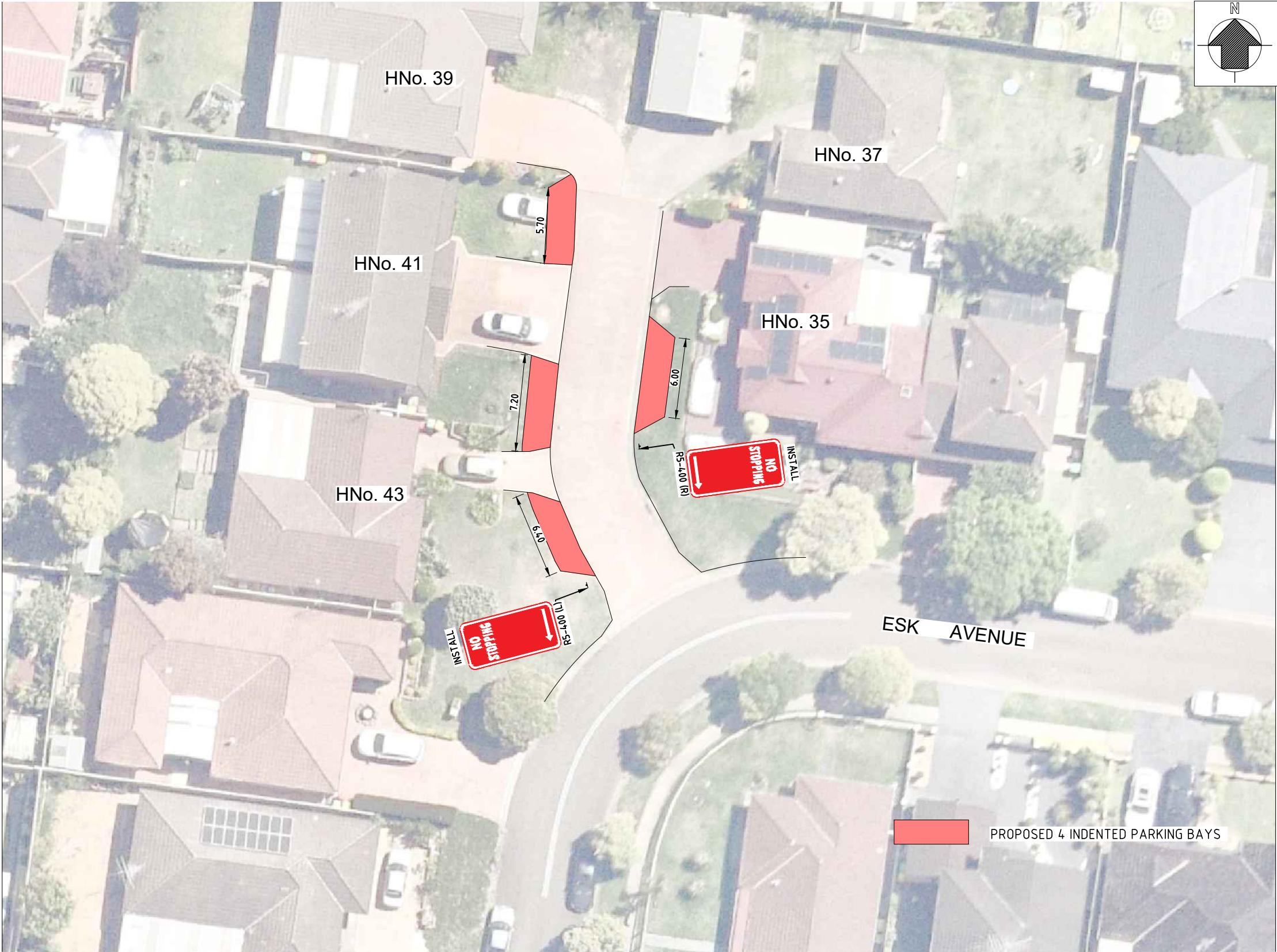






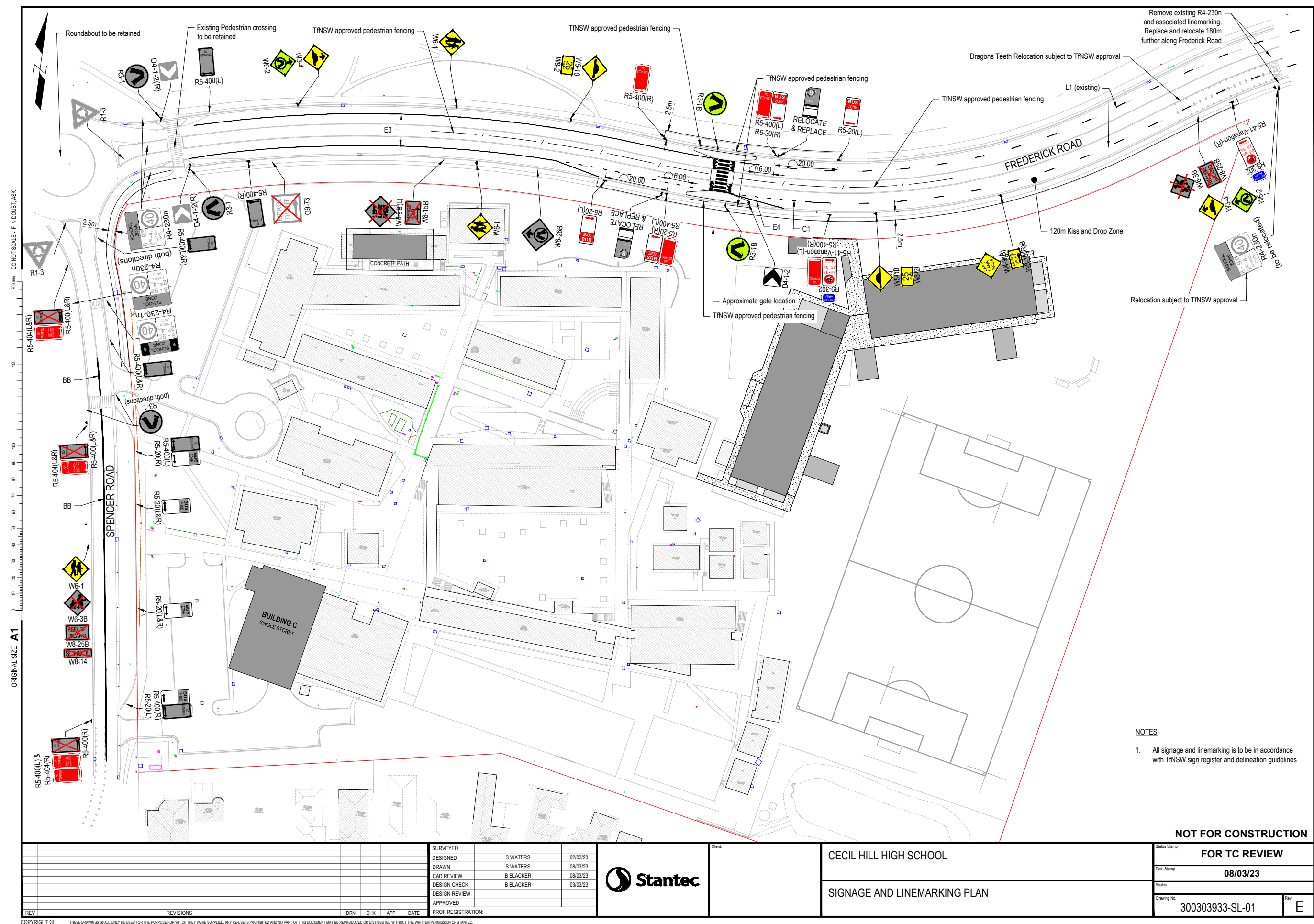
CONCEPT PLAN - PROPOSED INDENTED PARKING BAYS

SCALE 1:150



CONCEPT PLAN - PROPOSED INDENTED PARKING BAYS

SCALE 1:150





ATTACHMENT GB3.1

On average, every year in Liverpool **33** people are injured in speed related crashes on local streets.

The 50km/h default urban speed limit applies to all built-up areas across NSW and applies as soon as you turn onto any urban road without a speed sign.

ATTACHMENT GB3.1

Reduced speed limits at school zones, road works and other special areas still apply.

LIVERPOOL
CITY
COUNCIL

SLOW DOWN

www.liverpool.nsw.gov.au

An initiative of the Local Government Road Safety Program

ATTACHMENT GB3.2

Why?

- Improved road safety
- Safer streets for pedestrians
- Improved stopping distances

Research shows that even small reductions in vehicle speed can reduce the number of deaths and the severity of injuries from road crashes.

A car travelling at **50km/h** has a stopping distance 10 metres shorter than a car travelling at 60km/h. This is enough to save a life or avoid serious injury.

For a safer community, please remind family members and visitors to your home that the speed limit in your street is **50km/h**.

NSW Police enforce speeding and other driving offences. Fines and licence demerit points apply.

Speeding Offences = licence suspension for L and **P1** licence holders.

For more information phone **1300 36 2170** or visit www.liverpool.nsw.gov.au

SLOW DOWN

Giảm Tốc Độ

Rallenta

خفف السرعة

धीरे हो जाएँ

ATTACHMENT GB3.3

Ref No.: 206695.2022
Ph: 1300 36 2170
Date: June 2022

To the Resident
Bligh Ave
LURNEA NSW 2170

RE: Slow Down on Local Streets – Request to Attach 50km/hr Bin Sticker

Dear Resident,

As part of a Transport for NSW's Local Government Road Safety Program, Council is conducting a '**Slow Down**' program to help slow traffic down in local streets.

Council is seeking your help to promote that local streets are 50km/hr. Attached is a "Slow Down to 50 on Local Streets" A4 size sticker. We ask that you attach the sticker to your red general waste rubbish bin, on the side of the bin where it can be seen by oncoming traffic (see picture below).

The program is funded as part of TfNSW Local Government Road Safety Program and supported by Council. The program is also supported by NSW Police and so you may see extra patrols in your local area.

Please play your part for road safety - let's see the Slow Down sticker on your bin!

If you have any enquiries about the program, please contact Council on 1300 36 2170 or via email to roadsafety@liverpool.nsw.gov.au. You can also send a photo showing your support to the email address.





ATTACHMENT GB3.5

Slow down to



on local streets

**LIVERPOOL
CITY
COUNCIL**