GREATER SHEPPARTON

VICTORIA
State Government

Shepparton South East

Background Report

February 2024

Victorian Planning Authority

Acknowledgement of the Traditional Owners

The Victorian Planning Authority (VPA) proudly acknowledges Victoria's Aboriginal communities and their rich cultures and pays respect to their Elders past, present and emerging. We acknowledge Aboriginal people as Australia's First People and as the Traditional Owners and custodians of the land and water on which we rely.

We recognise and value the ongoing contribution of Aboriginal people and communities to Victorian life and how this enriches us. We embrace the spirit of reconciliation and ensuring that Aboriginal voices are heard.

The VPA would like to thank the Yorta Yorta Nation Aboriginal Corporation for their engagement throughout this project.

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1 INTRODUCTION

The Shepparton South East Precinct Structure Plan (PSP) and Development Contribution Plan (DCP) has been prepared by the Victorian Planning Authority (VPA) in collaboration with the Greater Shepparton City Council (Council) and with assistance from Government departments and agencies, service authorities and major stakeholders.

The PSP is a long-term plan for urban development. It describes how the land is expected to be developed, and how and where services and infrastructure are planned to support the development of new communities.

The DCP establishes a framework for developers to make a financial contribution towards the cost of key infrastructure projects, providing certainty for the future community around infrastructures timing, funding and delivery.

Together the PSP and DCP will provide a broad framework that will coordinate development and assist in the transition of the area from its current farming land and rural character into an urban residential expansion area for Shepparton.

In summary the PSP:

- sets out plans to guide the delivery of quality urban environments in accordance with the Victorian Government guidelines
- enables the transition of non-urban land to urban land
- sets the vision for how the land should be developed, illustrates the future urban structure and describes the outcomes to be achieved by the future development
- outlines the projects required to ensure that future residents, visitors and workers within the area can be provided with timely access to services and transport necessary to support a quality and affordable lifestyle
- sets out objectives, requirements and guidelines for land use, development and subdivision
- provides government agencies, the council, developers, investors and local communities with certainty about future development
- addresses the requirements of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) in accordance with an endorsed program under Part 10.

The PSP and DCP applies to approximately 385 hectares of land located approximately two kilometres south-east of the Shepparton CBD, as illustrated on Plan 1 – Regional Context Plan. It is envisaged that the PSP will accommodate 2,500 dwellings catering for a population of approximately 6,000 residents and have the capacity to accommodate 275 jobs.

1.1 Purpose of this document

The *Shepparton South East Precinct Structure Plan Background Report* (Background Report) assists in providing context to the preparation of the PSP, DCP and its associated documents. A full list of the supporting documents that have informed the preparation of the background report and PSP can be found at the end of the report.

Plan 1
Regional Context
Shepparton South East PSP & DCP

1:100,000 @ A4

0 1 2 3 4 5 km

N

Shepparton North

Shepparton CBD

Shepparton Marketplace

Mooroopna

Riverside Plaza

Shepparton South East PSP

MAH-SHEPPARTON ROAD

GOULBURN VALLEY HIGHWAY

SHEPPARTON ALTERNATIVE ROUTE ROAD

DOOKIE-SHEPPARTON ROAD

MIDLAND HIGHWAY

MIDLAND HIGHWAY

MIDLAND HIGHWAY

MOOROOPNA-MURCHISON ROAD

Broken River

Goulburn River

GOULBURN VALLEY HIGHWAY

EUROA-SHEPPARTON ROAD

5km

- precinct boundary
- railway line & V-Line station
- school
- central activities district
- regional retail centre
- sub-regional centre
- mixed use zone
- township zone
- commercial
- current/ future residential growth
- open space
- existing urban area

2 STRATEGIC CONTEXT

The Shepparton South East PSP precinct is in the municipality of Greater Shepparton, Victoria's fourth largest Regional city. Key strategic documents that are relevant to the PSP are listed below.

2.1 Plan Melbourne 2017-2050

A direction of *Plan Melbourne* is to promote the growth of regional Victoria. It seeks to cater for future housing needs in regional Victoria by ensuring that housing change areas are defined, such as redevelopment sites and areas suitable for growth development, to support long-term housing growth, choice and diversity for a range of household types. *Plan Melbourne* outlines the expected population of the regions to growth from 1.5 million to 2.2 million by 2051. Shepparton is one of Victoria's 10 regional cities (Figure 1: Victoria's connected cities and Regions in *Plan Melbourne*) and development of Shepparton should be in-keeping with its existing character, balanced with the protection of productive agricultural and horticultural land, economic resources, heritage, and biodiversity assets that are critical to Victoria's continued economic and environmental sustainability.

Figure 1: Victoria's connected cities and Regions in *Plan Melbourne*

Map 23

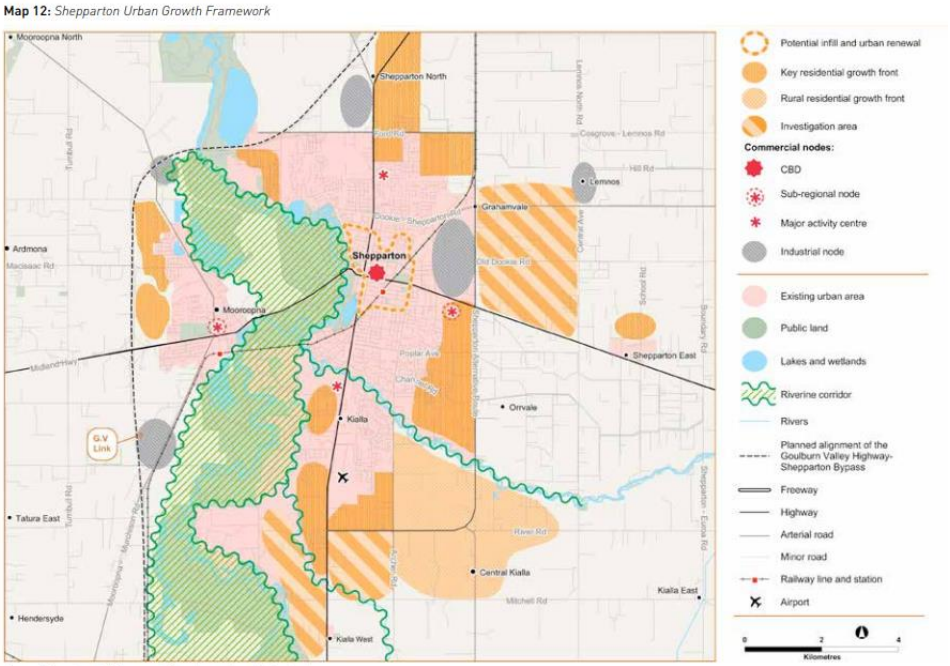
Victoria's connected cities and regions

- Capital city
- Regional city
- Regional centre
- 100-km radius from central Melbourne
- Transport gateway – airport
- Transport gateway – seaport
- Primary road
- Secondary road
- Rail network

2.2 Hume Regional Growth Plan

Hume Regional Growth Plan (RGP, 2014) provides high-level strategic guidance for land use and development across the Hume region of Victoria. Greater Shepparton is identified as a major growth location within the RGP. Within the RGP, the PSP area is identified as a 'key residential growth front' within the RGP (Figure 2 Hume Regional Growth Plan).

Figure 2 Hume Regional Growth Plan



Source: Department of Transport, Planning and Local Infrastructure

2.3 Shepparton Housing Strategy

The study area has been identified as one of five main residential growth areas for Shepparton and Mooroopna in the *Greater Shepparton Housing Strategy 2011*. It is the largest of Shepparton's growth corridors and is of key strategic importance to satisfying the future short to medium residential needs of the regional city (Figure 3: Shepparton South Growth Management plan, Figure 4: Shepparton South Housing Change Area Plan).

Figure 3: Shepparton South Growth Management plan

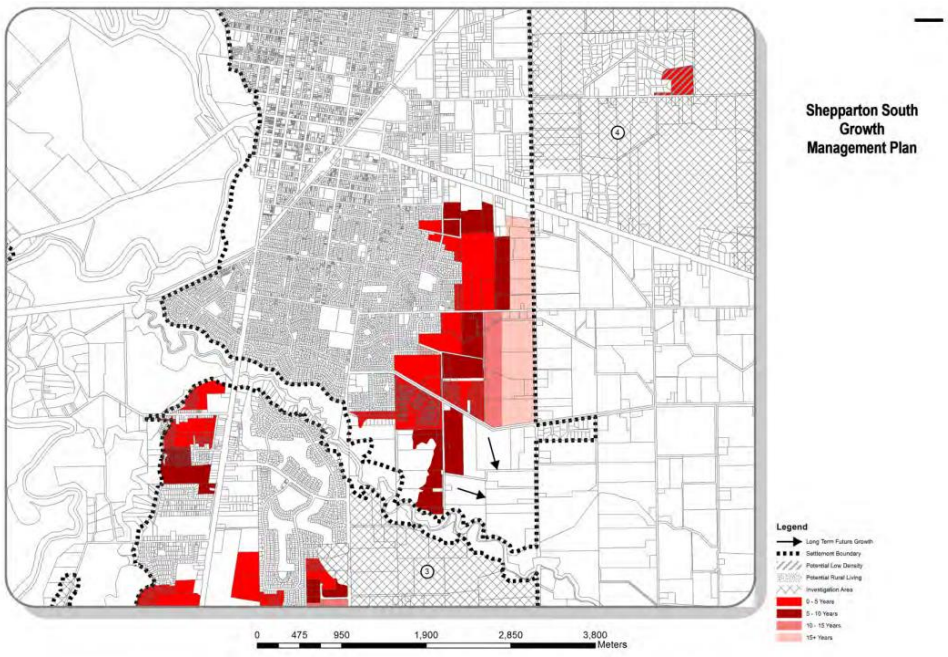
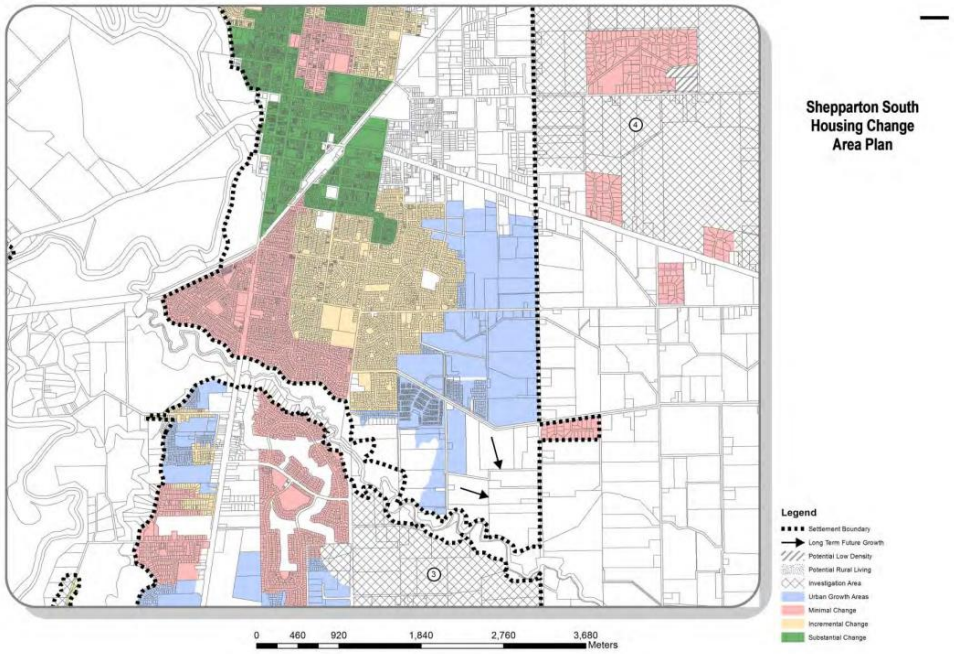


Figure 4: Shepparton South Housing Change Area Plan



3 LOCAL CONTEXT

Current land uses within the PSP boundary include intensive horticulture, other agriculture, and ancillary uses, with a small number of rural residential lots scattered throughout the precinct.

Until recently, the land within the PSP predominantly comprised of horticultural and ancillary uses including fruit orchards, cool stores and associated rural residential lots. Increasingly, these orchards have been cleared of vegetation and replaced with other agricultural uses.

There are several key Goulburn Murray Water (GMW) drain and irrigations channels that transect the precinct that previously (or continue) to service horticultural/farming uses within and beyond the precinct. Other uses of note include the Broken River, a key natural asset, and Doyles Road, a key freight and transport link.

3.1 Lot patterns and ownership

At the time of writing there are 88 properties within the precinct.

Lots within the PSP are characterised as medium to large in size, measuring between 0.5 hectares to 30 hectares. Smaller rural residential lots have also been subdivided over time. Ownership reflects the traditional horticultural uses that have historically dominated land use within the PSP.

3.2 Topography, geology and waterways

The PSP features incredibly flat terrain, with elevations ranging from 115m AHD (eastern boundary) to 113m AHD (western boundary). The catchment falls gently in a south westerly direction towards the Broken River. There are localised raised areas where irrigation supply channels are located. These form barriers to overland flows, which is why the irrigation channels often form the catchment boundaries, of which six sub-catchments have been identified in the PSP area.

Spiire, on behalf of GSCC, commissioned Geotechnical Testing Services (GTS) in 2014 to confirm geotechnical conditions. The assessment found soils of the precinct comprised primarily of sandy silt and silty clay. Groundwater was generally not encountered up to 6m depth.

SMEC in 2018, confirmed that the geotechnical conditions are unlikely to present a significant constraint to development. The expected geology is typical of a large portion of the Shepparton area where similar structures have been developed and the risks identified could be appropriately managed through proper planning, investigation, design and construction.

A series of Goulburn Murray Water (GMW) irrigation channels and drains transverse the site (Figure 7: Existing GMW assets). The channels supply irrigation water to the land used for horticultural and other agricultural uses to the east. The drains collect run-off water from agricultural land. The channels and drains traversing the precinct vary in width and depth and are discussed in detail in Section 9.1 of this report.

Views across the area are limited by vegetation and the flat topography of the land. Some longer views are available across cleared land, framed with distant vegetation. Where orchards exist, views are at times obstructed and limited along the road corridor.

The only natural surface water body of significance was the Broken River adjacent the southern boundary of the precinct.

3.3 Surrounding land uses

Shepparton Market Place/Midland Highway

To the north lies the Midland Highway which features a range of retail, commercial and industrial uses. The Shepparton Marketplace is a key regional retail centre, which sits adjacent to a homemaker's centre, construction, automotive and logistics suppliers. There is also an aged care facility and bowls club that sits upon land immediately north of the PSP boundary. The Zurcas Lane investigation area is also located immediately north of the precinct and is further discussed below.

Zurcas Lane investigation area

Land located between the commercial development of Midland Highway and the northern boundary of the PSP upon the eastern side of Zurcas Lane has been excluded from the PSP boundary. This is due to the anomaly of existing land uses (parcels currently identified as INZ1, FZ) and the unresolved nature of future land uses proposed within this area. Further investigations are required upon this land to determine suitability for rezoning to accommodate sensitive uses.

GSCC will lead a rezoning process for this land either in parallel or following the planning scheme amendment process for the PSP (C117gshe).

The PSP will be developed in a manner that is conducive and cohesive to the development of this land, identifying the need for a local road interface at this boundary. Until rezoning of this land occurs, any application for sensitive uses at this interface will need to respond to the existing zone constraints.

East of Doyles Road

To the east features a mix of horticultural and ancillary uses including fruit orchards, cool stores and associated rural residential lots, Orrvale Primary School, Council depot and a small cluster of low density rural residential lots. Doyles Road represents the eastern extent of residential expansion within Shepparton. Importantly Doyles Road has been identified as part of the Bypassing Shepparton program, known as the Shepparton Alternative Route (SAR), and has been identified for duplication from a two-lane to a four - lane arterial freight route of strategic importance. The SAR duplication is further discussed in Section 11.1.1 of this report.

Council and the VPA commissioned RMCG to prepare the March *2020 Shepparton East Agricultural Land Use Options* report as part of the Shepparton-Mooroopna 2050 Regional City Growth Plan. The report was prepared to investigate the viability of agriculture in Shepparton East, alternative farming practices suitable for the land's context, and planning responses to residential-farming land use conflicts. The report supports the ongoing use of land for agricultural farming uses to the east of Doyles Road directly adjacent the PSP.

Kialla North Growth Area

The Kialla north growth area is situated immediately south of the precinct across the Broken River. It currently features a mix of horticulture, other agriculture, and ancillary uses, with a small number of rural residential lots scattered throughout. This area is zoned Urban Growth Zone (UGZ).

The precinct abuts the western extent of urban development for Shepparton, primarily residential in nature, it contains aged care facilities, V E Vibert Reserve, existing education facilities including Wilmont Road Primary and GoTafe.

4 ABORIGINAL CULTURAL HERITAGE

The precinct is located on the traditional lands of the Yorta Yorta people. The Yorta Yorta Nation Aboriginal Corporation (YYNAC) is the Registered Aboriginal Party (RAP) relevant to the precinct area.

Jo Bell Heritage Services was commissioned in 2019 to prepare a due diligence assessment for Cultural Heritage to inform preparation of the PSP.

The assessment found that there are no places of Aboriginal cultural heritage significance recorded on the Victorian Aboriginal Heritage Register within the Shepparton South East PSP.

Two areas of the PSP are identified as Areas of Cultural Heritage Sensitivity. One of these areas occurs within 200m of the Broken River. The second occurs along the alignment of Poplar Avenue; however, this area has been subject to significant ground disturbance. Land within 200m of the Broken River has been assessed as having high potential for sites, while land extending beyond 200m of the river has been assessed as having medium to low potential for sites.

Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulation 2018

The Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulations 2018 outline the triggers for the requirement to complete a Cultural Heritage Management Plan (CHMP).

Recommendations have been responded to in the following manner:

- A CHMP is required for any activity deemed high impact that will occur within these Areas of Cultural Heritage Sensitivity as identified in Plan 2 and 5 of the PSP, unless proponent can prove the area was subject to significant ground disturbance.
- No residential development will occur within the Areas of Cultural Heritage Sensitivity associated with the Broken River corridor. Land within this area is a floodplain and will be set aside to protect cultural heritage values and to preserve biodiversity and native vegetation within it. There may be opportunities for cultural heritage initiatives ad passive recreation within the Broken River corridor, such as walking paths.
- Retarding Basin 1, 5 and 6 have been placed partially in the Area of Cultural Heritage Sensitivity and will require a CHMP for the earth works to be prepared by the proponent. Engagement with the YYNAC will be required and should the basins need to relocate, Council will be required to pay for costs to determine a new location.

5 HISTORICAL HERITAGE

Tardis Pty Ltd prepared an assessment of historical heritage within the precinct in 2009. The aim of the assessment was to determine if there were any items of historical heritage significance present within the precinct and provide recommendations as to how this amendment should respond. Findings of this assessment were supported by site assessments and additional investigations undertaken by Council's heritage advisor in 2022 and 2023.

The assessment found that there is one previously recorded historic inventory listed site situated within the activity area (H 7925-0025). This site along Doyles Road is not included in a Heritage Overlay or listed on the Victorian Heritage Register. This site comprises a cultural landscape known as the Orrvale Lemnos Closer Settlement Scheme, a group of 22 (1920s) closer settlement houses along Doyles Road. The buildings were defined as a cultural landscape as they form a pattern of development associated with a historical theme for the area, irrigation farming.

Many of the houses occurred along the western side of Doyles Road. Eight of these houses are within the activity area however almost all have now been demolished.

Another potential feature which exists within the activity area comprises irrigation channels; however, none of the irrigation channels have been determined to meet the threshold of local heritage significance.

GSCC's Heritage Advisor undertook a field assessments in 2022 and 2023 as part of the *East of Shepparton Historical Heritage Study* to identify whether any remaining houses or other structures originally included in the Orrvale Lemnos Closer Settlement Scheme still exist in situ and to create an inventory of any remaining houses in an effort to record their integrity and reassess their significance. The study found a number of properties provided tangible evidence of the Closer Settlement policies and evidence of a community of Jewish settlers who arrived at Shepparton Estate 2 with eight families on 14 April 1913. The families established a synagogue and constructed a number of houses, one of which contains remnants of a rare surviving example of a mivkah (traditional cultural cleansing bath). The study determined that the following properties were deemed to meet the threshold of local heritage significance:

- 630 Doyles Road, Shepparton (house)
- 26 Feiglin Road, Shepparton (house)
- 27 Feiglin Road, Shepparton (group of three houses)
- 32 Feiglin Road, Shepparton (house)
- 130 Poplar Avenue, Shepparton (house)
- 190 Poplar Avenue, Shepparton (memorial plaque)

Recommendations have been responded to in the following manner:

- Six properties will be identified as having local heritage significance within the PSP.
- An area within the precinct (along Doyles Road) is included on the Victorian Heritage Inventory (H7925-0025). Proponents are required to comply with the Heritage Act 2017 in relation to obtaining any necessary consents for works or activities which may impact the historical archaeological features, deposits, and / or artefacts of the area.
- The Heritage Overlay will be applied to these six properties as part of C117gshe Planning Scheme Amendment in accordance with the statements of significance to guide their future conservation.
- PSP Section 4.1 includes requirements and guidelines to guide development adjacent places of heritage significance.

6 BIODIVERSITY

Ecology Heritage Partners (EHP) were commissioned in October 2021 to provide an updated biodiversity assessment of the precinct, fulfilling several actions recommended by Ecology Heritage Partners (EHP) from an earlier assessment conducted in 2009. The aim of the assessment was to confirm the presence of native vegetation and identified flora and fauna species with potential to be found within the precinct. A site visit and targeted surveys were undertaken by EHP as part of this exercise.

6.1 Native Vegetation and Flora

The precinct has previously been cleared of native vegetation for horticultural, commercial and residential uses; however, remnant native vegetation persists in isolated locations. mainly along the Broken River, while non-native vegetation is found in street plantings and orchards.

Remnant vegetation is located predominately along the Broken River near the southern boundary of the area, as well as scattered along road verges and rural dwelling frontages, while additional established trees are found in private yards and gardens.

Overall, it was found that the majority of the precinct was highly modified by historic and current agricultural practices. The report identified 19.54 hectares of native vegetation, consisting of:

- 17.65 hectares of riparian woodland
- 1.89 hectares of plains woodland
- 34 scattered trees

There is record of one nationally significant and 18 state significant flora species within 10km of the precinct, however there is no record of any of these species within the precinct. An additional six nationally significant species have the potential to occur within the precinct. Of these state and nationally significant species, there is suitable habitat within the precinct for the following

- Buloke mistletoe
- Late flowering Flax Lily

Neither of the above species were detected during targeted surveys undertaken by EHP. Additional species were considered unlikely due to the high levels of disturbance and lack of suitable habitat in the precinct.

Recommendations have been responded to in the following manner:

- Majority of remnant native vegetation is located in the Broken River corridor.
- No residential development will occur within the Broken River corridor. Land within this area is a floodplain and will be set aside for this purpose in addition to protecting cultural heritage values and to preserve biodiversity and native vegetation within it. There may be opportunities for cultural heritage initiatives and passive recreation within the Broken River corridor, such as walking paths.
- This area also provides the opportunity to increase and restore the ecological values of the Broken River riparian corridor environs.

- Section 4.3.1 of the PSP includes Requirements and Guidelines that direct consideration for incorporation of scattered trees into future subdivision design, via local parks or streetscapes etc, that sit outside of the Broken River corridor.

6.2 Fauna

Targeted surveys were undertaken across the precinct to determine state and nationally significant species with potential habitat, including – Barking Owl, Powerful Owl, Brown Toadlet and the Growling Grass Frog. Majority of identified significant fauna potential habitat was located within the riparian corridor of the Broken River

No state or nationally significant species were detected as part of the assessment, although the Brown Toadlet has previously been recorded within the precinct. It is believed that there will be no impacts to Matters of National Environmental Significance protected by the EPBC Act and species protected by the FFG Act from the proposed development.

Any future development needs to consider and mitigate any potential indirect impacts to the Broken River. Most habitat for potential fauna are contained within the Broken River and associated riparian corridor, which provides suitable habitat for several significant species, including:

- Painted Honeyeater
- Squirrel Glider
- Musk Duck
- Freckled Duck
- Blue-billed Duck
- Square-tailed Kite
- Bluenose Cod
- Murray Cod
- Murray Short-necked Turtle
- Crimson-spotted Rainbowfish
- Silver Perch
- Platypus

Additional species are unlikely to rely on the broader precinct for foraging or breeding due to the lack of habitat and highly modified nature of the landscape.

Brown Toadlet survey were undertaken as part of the targeted survey work completed, however not in their peak calling season. Potential habitat for the species is located in the Broken River riparian corridor. Findings of the targeted surveys note, though unlikely to be found, additional targeted surveys could be undertaken to confirm the species. Noting that development will not occur within the area in which their potential habitat is located. Council have committed to undertake targeted surveys within the area prior to commencing any drainage asset works.

It was also recommended that any drainage assets have consideration for the *Growling Grass Frog Habitat Design Standards* (DELWP 2017) to provide potential habitat for a range of local indigenous fauna.

Recommendations have been responded to in the following manner:

- Majority of the fauna species and associated potential habitat were located in and adjacent the Broken River corridor.
- Targeted surveys have been undertaken with findings supporting proposed future development within the precinct, noting the majority of potential species and habitat are associated in the Broken River corridor, .
- No residential development will occur within the Broken River corridor. Land within this area is a floodplain and will be set aside for this purpose in addition to protecting cultural heritage values and to preserve biodiversity and native vegetation within it. There may be opportunities for cultural heritage initiatives and passive recreation within the Broken River corridor, such as walking paths.

- The Brown Toadlet surveys cannot be triggered via a subdivision permit, given no development will occur within the area of potential habitat. Guideline 33 in the PSP outlines the need for any biodiversity to be considered as part of the development of any drainage assets within the Broken River flood plain. (Noting assets RBWL-1 and RBWL-6, are not located within the riparian corridor in which Brown Toadlet habitat could potentially be located). Council have committed to undertake the required surveys prior to any development of drainage assets.
- Construction and design of drainage assets will consider application of the *Growling Grass Frog Habitat Design Standards* (DELWP 2017) for best practice habitat standards for local fauna.

7 NATURAL HAZARDS

7.1 Flooding

Shepparton sits at the confluence the Goulburn and Broken Rivers and as a town has a history of flooding, due to its proximity to these waterways and extremely flat topography. The Broken River forms the southern boundary of the PSP.

Before the Goulburn River, reaches Shepparton, three important waterways flow into it.

- The Broken River which comes from Benalla (southern boundary of the PSP)
- the Seven Creeks which comes from Euroa and the Strathbogie Ranges.
- the Castle Creek which comes from Arcadia.

A flood event in Shepparton will be different depending on which waterway floods, how high the water reaches, and which waterway peaks first.

We cannot prevent flooding occurring, however through land use planning, infrastructure, and floodplain management we can manage the risks.

Council partnered with the Goulburn Broken Catchment Management Authority (GBCMA). to prepare the Shepparton Mooroopna 1% AEP Flood Mapping Project in 2021. This overarching flood assessment has been adopted as the base flood modelling to inform the Shepparton South East PSP. It provides the most up to date flood mapping data to inform planning for this PSP. Further information on this assessment is included in section 7.1.1. The investigation area for this assessment is included in Figure 5.

Additionally, two precinct level flood assessments have informed planning and infrastructure outcomes for the precinct as outlined in section 7.1.2 and 7.1.3. Two precinct level flood assessments have been undertaken as the precinct features two drainage sub-catchments as outlined in figure 6.

Figure 5 – Shepparton Mooroopna 1%AEP Flood Mapping Project Investigation Area

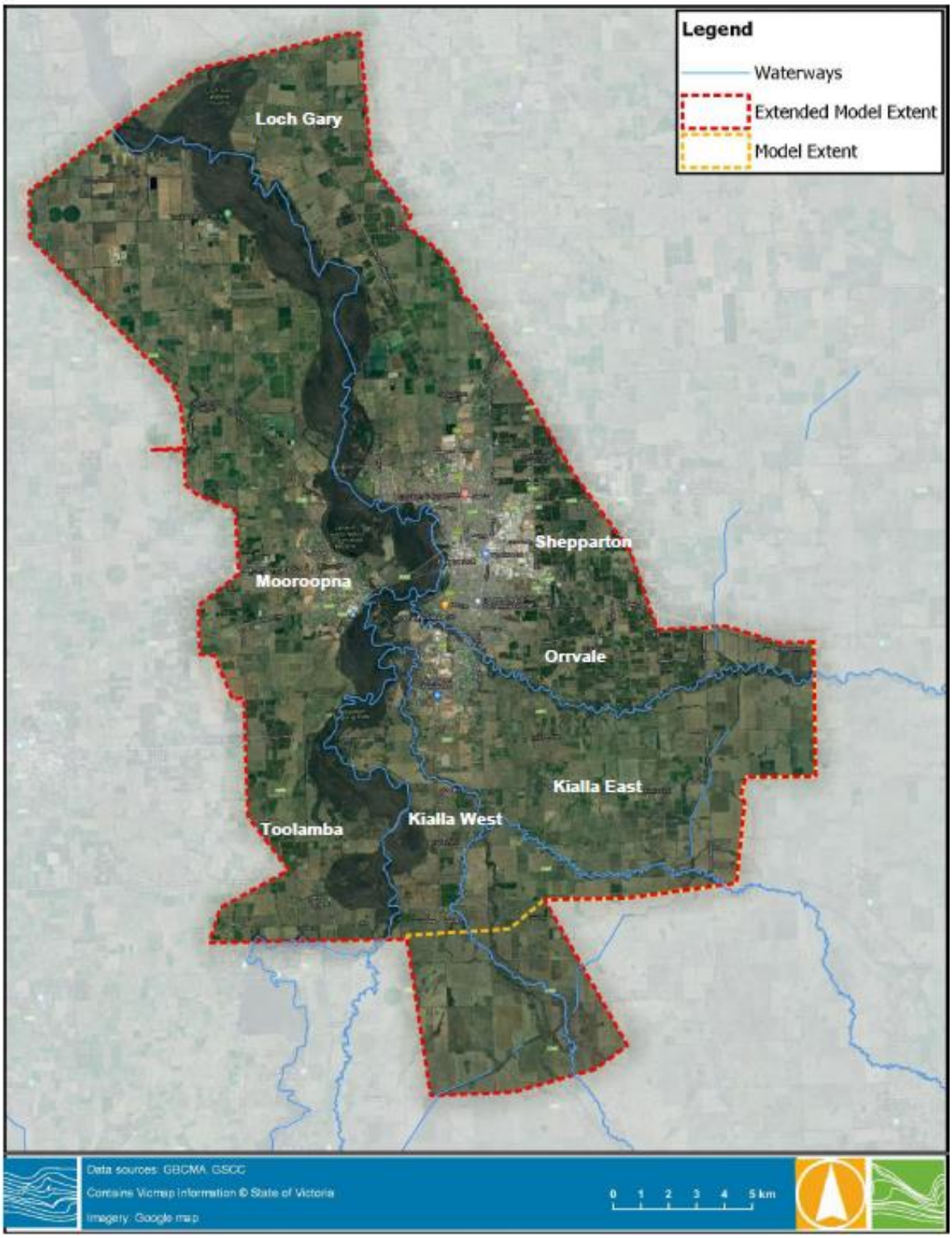
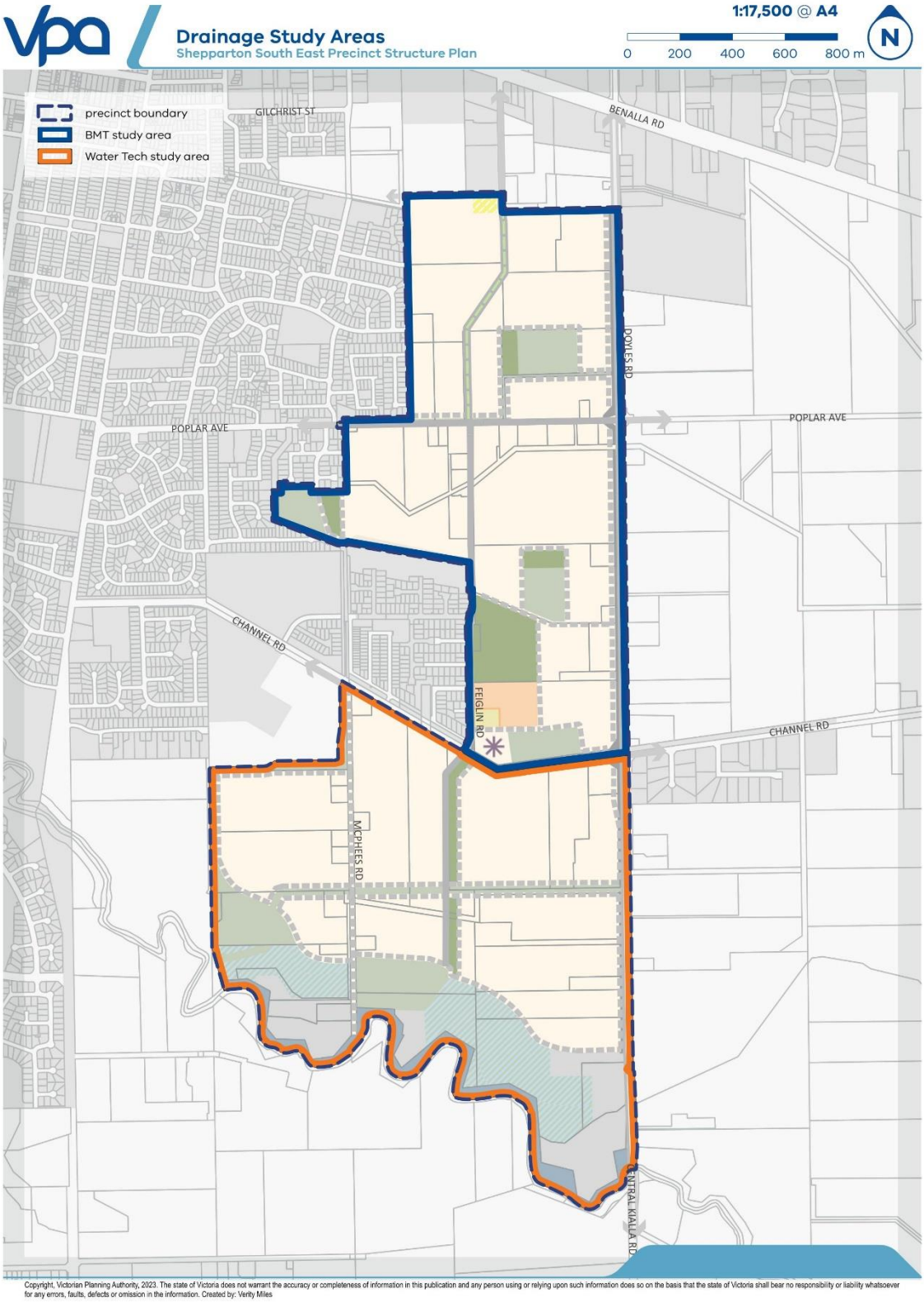


Figure 6 – Shepparton South East Drainage Sub catchments



7.1.1 Shepparton Mooroopna 1% AEP Flood Mapping Project (Water Technology, April 2021)

The Shepparton Mooroopna 1% AEP Flood Mapping Project (adopted at the Ordinary Council Meeting, 15 February 2022) was commissioned by Greater Shepparton City Council in conjunction with GBCMA. The purpose of the project was to provide a timely update to the Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002. Water Technology investigated flooding, through the use of technological advances (such as topographic data), improved flood modelling software and generally a greater understanding of the surrounding watercourses.

Through updating the flood modelling, several policy recommendations were proposed, to amend in the Greater Shepparton Planning Scheme. Changes were centred around the flooding components of the planning scheme (Land Subject to Inundation Overlay, Floodway Overlay and Urban Floodway Zone) and will be implemented through an upcoming planning scheme amendment. Through these changes, it will ensure that appropriate flooding controls are applied to the municipality and that inappropriate development within flood prone areas are not permitted.

The report is available via the Council website - *Shepparton Mooroopna 1% AEP flood mapping project*

7.1.2 Shepparton Mooroopna 1% AEP Flood Mapping Project: Shepparton South East Addendum (Water Technology, May 2022).

In 2022, Water Technology prepared an addendum to the Shepparton Mooroopna 1% AEP Flood Mapping Project, which specifically looked at the southern portion of the PSP (Channel Road to the Broken River). The assessment was prepared and endorsed by Council as the drainage authority and the Goulburn Broken Catchment Management Authority (GBCMA) as the floodplain manager. The assessments methodology aligns with national standards as determined by the GBCMA. In addition, the design standards and drainage outfall have factored in Goulburn-Murray Water specifications.

The aim of this assessment was to test a 1% AEP plus climate change flooding scenario against the drainage infrastructure assets proposed for the PSP to ensure they met national and state policy requirements.

The assessment factored in the Intergovernmental Panel on Climate Change (IPCC) scenario of global warming of 4% (equating to a 21% rain fall increase) to the year 2090. This is the same climate change scenario that has underpinned the *Shepparton Mooroopna 1% AEP flood mapping project*

The results of this assessment indicated that in a 1 % AEP plus climate change events, localised rainfall drains overland across the precinct into the existing drainage channels to the west and then subsequently drains south and into the Broken River. Additionally, the precinct is subject to riverine flooding associated with the Broken River, impacting land predominantly south of Channel Road. This area is also impacted by overland flows entering the site from the east of Doyles Road.

As a result of this assessment:

- The need for a floodplain area adjacent the Broken River was defined by the GBCMA that will result in 23.28ha of land being set aside to protect future development from the impacts of riverine flooding. Given the new flood plain identification the existing Urban Floodway Zone (UFZ) be amended to align with this area. This area of land will add an additional 5,000m^3 of flood storage capacity within the precinct and ensure that riverine flooding will not impact new development of the PSP. Given proposed UFZ zoning no further development will be permitted within this area and Council will acquire large proportion of

the flood plain area, via the use of a public acquisition overlay (PAO). No houses currently within the floodplain will be acquired by Council via the PAO, only excess land surrounding, enabling existing houses and access arrangement to remain. Existing houses within the flood plain will be able to remain, however will not be able to intensify or subdivide unless permitted by Council and the GBCMA.

- The GBCMA has advised against location of any stormwater infrastructure assets within 50m of the top of the bank from the Broken River within the floodplain area as this could have potential geomorphic consequences created by lateral migration of the river channel impacting the integrity of the assets.
- The need for a 30m wide overland flow path running east-west across in the south of the precinct is required to convey flows entering the precinct east of Doyles Road. The overland flow path is required to meet GBCMA requirements for no water level increase of more than 2cm outside the study area compared with the existing conditions for the 1% AEP plus climate change Broken River flood event.

Additionally, to ensure that future houses in the PSP are not impacted by flooding in severe storm events all new development within the PSP will be required to:

- Fill land to 300mm above the 1%AEP plus climate change level prior to development occurring.
- Have a finished floor level of 300mm above the 1%AEP plus climate change level.
- Ensure that local roads are no lower than 300mm below the 1%AEP plus climate change level to maintain access and egress.

Applications demonstrating the above must be assessed and approved by both Council and the GBCMA.

All the above requirements are consistent with the Infrastructure Design Manual, Victorian Planning Provisions and DELWP and GBCMA development guidelines for land in flood prone areas.

7.1.3 Shepparton East Updated Flood Impact Assessment (BMT, July 2022)

In 2020, BMT was engaged to investigate the potential flood impacts of the stormwater drainage designs (discussed further in section 10) of the precinct. Much the same as the process undertaken by Water Technology outlined in section 7.1.2, the aim of the assessment was to simulating flood conditions through a calibrated model, which tested the proposed stormwater designs against a 1% AEP design flood event. Following their advice, further work has been undertaken to refine the designs and as a result in August 2022, BMT were re-engaged, to provide an update to their 2020 advice.

Due to the southern portion of the precinct, being analysed by Water Technology, the study area for the assessment was bounded to the northern section of the precinct (Channel Road to Midland Highway).

Changes were made to the model to best reflect the updated information as outlined in their report. Overall, outcomes of the assessment supported the proposed stormwater designs for the precinct and identified a reduction of flood levels out of the precinct.

Recommendations have been responded to in the following manner:

- A new floodplain area will be designated in the PSP to achieve this an area of 23.28ha will be reserved and provide an additional flood storage capacity of 5,000m3. New development or intensification of uses will not be permitted upon land required for the floodplain.

- Land for flood mitigation (identified as SC-01) adjacent to the Broken River (floodplain) will be acquired by Council through the application of a Public Acquisition Overlay (PAO). Purchase of this land for the floodplain is included in the DCP.
- An east-west overland flow path (identified as SC-02) is included in the southern portion of the PSP and will be acquired by Council through the application of a Public Acquisition Overlay (PAO). Purchase of land and construction for the overland flow path is included in the DCP.
- The PSP, flood requirements must be met as part of future development applications:
    - The Broken River corridor must be protected as a waterway corridor with no drainage assets to be located any closer than 50m from the top of bank and designed to the satisfaction of the responsible authority and GBCMA.
    - Encroachment or intensification of development must not occur within the Broken River's floodplain as identified upon Plan 12.
    - Applications must demonstrate:
        - GBCMA freeboard requirements for finished floor level of buildings to be set at least 300 millimetres above the 1%AEP or 1 in 100 ARI (including climate change), excluding garages, are met
        - GBCMA balanced cut and fill requirements to ensure lots are filled 300 millimetres above the applicable 1%AEP or 1 in 100-year ARI flood level are met.
        - GBCMA requirement for roads to be no lower than 300 millimetres below the 1%AEP or 1 in 100 ARI (including climate change) are met.
        - All applications must be to the satisfaction of the responsible authority and/or GBCMA, GMW and any retail water authority as required.

Planning ordinance outlines the following:

- Schedule 2 to the Urban Growth Zone (UGZ2) applies the Urban Floodway Zone (UFZ) to the new Broken River floodplain area. In addition, the Floodway Overlay (FO) will be applied to the Broken River floodplain and non-developable land adjacent to the Broken River to further control development in these areas.
- The existing Land Subject to Inundation Overlay (LSIO) will be amended to reflect the latest flood modelling data for the precinct which has been prepared with input from the VPA, DTP, GBCMA, G-MW and Council and incorporates the latest climate change scenarios for the precinct. This flood modelling data will result in both the addition and the removal of the LSIO in various locations across the precinct. It is noted the changes to the location of the LSIO is consistent with the recommendation of a municipal wide flooding amendment led by DTP which is expected to update the extent of the LSIO across the municipality.
- No subdivision to be permitted, unless the following can be met to the satisfaction of the Responsible Authority:
    - A drainage and fill strategy, designed to ensure that development of the sub-precinct can meet the following requirements:
        - No new lots created where the building envelope is subject to inundation from 1% AEP flows (accounting for climate changes scenarios);

- Any overland paths in road reserves meet Goulburn Broken Catchment Management Authority floodway safety criteria for depth of flow and flow velocity;
- Any overland flows be fully contained within reserves (road, open space);
- Flooding cannot be increased either upstream or downstream of the precinct or for existing landholders, and;
- The drainage network must have capacity for the 5% AEP flood.

7.2 Bushfire

Terramatrix was commissioned to conduct a *Bushfire Development Report* to inform the preparation of the Shepparton South East PSP in 2018 (revised July 2023). The aim of the report was to determine how development in the Shepparton South East PSP should respond to bushfire risk and comply with the applicable planning and building controls that relate to bushfire.

Approximately 22% of the precinct was found to be within the Bushfire Prone Area (BPA), with 14% of the precinct being covered by the Bushfire Management Overlay (BMO). Land covered by the BMO comprised of vegetation within approximately 150m of the Broken River.

Overall, the PSP was deemed a low bushfire risk landscape. This was due to a combination of factors:

- The landscapes in directions that bushfire typically arises (north, northwest, west or southwest) comprised low risk vegetation.
- The vegetated corridor is relatively small and narrow and is therefore unlikely to support a large scale bushfire.
- Low risk urban areas and townships adjacent to the precinct offer protection from bushfire.
- The topography of the precinct is benign, with no significant elevation changes or slopes.

The following bushfire setback recommendations apply to the PSP:

- 19m should be applied from all upslope or flat grassland.
- 33m from all upslope or flat woodland in areas of BPA.
- Residential uses within the BMO, would likely be suitable for the application of BMO1, which would require a BAL12.5 building standard and set amounts of defendable space.
- Wetlands or other water and drainage areas in the BPA could potentially comprise classified vegetation if they do not meet on or more exclusion criteria.
- Seasonally inundated wetlands that may be dry and vegetated during fire danger period could comprise classifiable Grassland or Shrubland, requiring a 19m setback for BAL-12.5 buildings.

Recommendations have been responded to in the following manner:

- The BMO is fully contained within the land area set aside for the Broken River floodplain and as such will not enable new or intensification of development to encroach within this area.
- The area of BMO applied to residential areas is extremely minimal, and therefore application of BMO1 is not necessary.
- The Bushfire Management section 4.4 of the PSP outlines setback recommendations for the remaining BPA areas, including requirements and guidelines that must be adhered to by future development in impacted areas.
- Road cross section 4 has been developed to demonstrate how future development must be setback in accordance with recommendations as outlined in the Bushfire Management section of the PSP.
- Schedule to the UGZ to include application requirements to prepare a Bushfire Management Plan as part of subdivision application.

8 LAND CAPABILITY

SMEC were commissioned by the VPA in 2018 (revised March 2022) to prepare a *Land Capability Assessment* to inform preparation of the PSP. The aim of the assessment was to determine previous land uses and implications for environmental contamination, hydrology and geology that require consideration in planning for the precinct.

8.1 Land Contamination Assessment

Three sites were nominated as High risk, two being host to underground petroleum stores and one being a site where automotive repairs and engine works were identified to be taking place. Where underground storage tanks are identified there are additional standards for this infrastructure to be decommissioned. 22 Medium risk sites were identified, these were associated with primarily agricultural land where activities such as the below had taken place, including:

- Chemical storage.
- Above ground fuel storage.
- Waste disposal.
- Stockpiling of building rubble (potentially including asbestos).

On 1 July 2021, the *Environmental Protection Act 2017* (EP Act) became operational and Amendment VC203 implemented new environment protection legislation and tools in the Victorian Planning Provisions (VPP).

The amended Environmental Audit Overlay (EAO) includes new requirements to align with the audit system under Part 8.3 of the new EP Act and incorporates the Preliminary Risk Screen Assessment (PRSA) tool to determine whether an environmental audit is required before sensitive uses can commence or before commencing buildings and works associated with a sensitive use. An EAO has been applied to the sites identified as high and medium risk in accordance with the SMEC Land Capability Assessment.

Geotechnical conditions were found to be unlikely to present a significant constraint to development, however site-specific investigations of sub-surface conditions were recommended at time of development.

Recommendations have been responded to in the following manner:

- Where possible non-sensitive uses have been aligned with sites identified as having high potential for contamination to reduce the burden of having to undergo an unnecessary audit process.
- An Environmental Audit Overlay will be applied to the precinct as part of this amendment. This will trigger the need for Environmental Audits or Preliminary Risk Site Assessments as part of future applications.

8.2 Sodic Soil

Surface soils in areas throughout the site were classified as Sodic with an Exchangeable Sodium Percentage (ESP) of 6-15%. There is no known regulation that would prevent a specific land use due to sodic soils, however, the site condition may require management on a case-by-case basis to assess how sodic soils will impact any proposed changes in land use.

Regarding future development, it was recommended that the sodic soil risk be documented within a Construction Environmental Management Plan (CEMP) which lists the required controls to manage sodic soils, in particular:

- Due to the increased risk of erosion of sodic soils which are present across the study area, it is recommended that soil disturbance be avoided in steeper areas (greater than 5% slope).
- In areas with a slope of greater than 10%, additional erosion protection measures may be required to reduce the risk of erosion of sodic soils across the site.
- Protection measures are likely to involve the establishment of perennial ground cover vegetation and soil amelioration through the application of gypsum and/or organic matter.

Recommendations have been responded to in the following manner:

The UGZ will include:

- Specific Provisions – Buildings and works Bulk Earthworks

  A permit is required for bulk earthworks, unless a report has been prepared to the satisfaction of the responsible authority demonstrating that sodic and/or dispersive soils are not present in the works area.

- Application Requirements - Sodic and dispersive soils management plan

  For an application to subdivide land or construct or carry out bulk earthworks, a sodic and dispersive soils management plan must be prepared by a suitability qualified professional, that describes:

  - The existing site conditions, including:
    - extent of sodic and dispersive soils based on topsoil and subsoil samples in the works area.
    - land gradient.
    - erosion risk mapping.
    - the extent of any existing erosion, landslip or other land degradation.
  - Soils investigation, undertaken by a soil scientist;
  - The extent of any proposed earthworks;
  - Recommendations for soil management practices (including fill) with consideration of anticipated sodic and dispersive soil exposure;
  - The management of drainage during all stages of development (including run-off);
  - The staging of development;
  - Any training and supervisions processes proposed for construction contractors to ensure compliance with the sodic and dispersive soils management plan;
  - Proposed document monitoring and reporting processes that ensure works are undertaken in accordance with the sodic and dispersive soils management plan;
  - Any treatment of soil proposed to be removed from the site;
  - Any post-construction monitoring and/or management requirements; and
  - Recommendations that inform a site management plan including:
    - The management, volume and location of any stockpiles.
    - Vehicle access and movement within the site area.
    - Any treatment to manage the soil while works are undertaken.
    - Treatments to rehabilitate areas that are disturbed during site works.
    - Any soil treatment to manage the soil to reduce risk to existing or current infrastructure and dwellings.

- Conditions and Requirements for Permits - Requirement – Sodic and dispersive soil site management plan

  A permit to subdivide land or to undertake earthworks must include a condition that requires a site management plan be prepared that implements the recommendations identified in the sodic and dispersive soil management plan, to the satisfaction of the Responsible Authority.

8.3 Amenity Assessment

GHD was commissioned in 2021 to prepare an *Amenity Impact Assessment* (AIA), to assess potential sources of adverse amenity impacts in relation to air quality including dust, odour and/or air emissions from existing uses within and outside the precinct. The VPA and Council also commissioned the preparation of the *Shepparton East Agricultural Study* by RMCG in 2020 that specifically looked at the nature of ongoing agricultural uses east of Doyles Road.

8.3.1 Industry with Adverse Amenity Impacts

Industries with the potential to emit odour, dust and/or air emissions within the precinct and a 2 km surrounding catchment area were identified. The application of separation distances from EPA Publication 1518 and DWER Odour emissions guideline was applied to the following industries, and it was found that the precinct was not constrained by any of the identified industries:

- SPC
- Shepparton Regional Saleyard
- Future Recycling Metals
- Civilmart Shepparton Precinct
- Boral Concrete
- Freedom Foods

Recommendations have been responded to in the following manner:

- No mitigation measures required by the precinct concerning industry.

8.3.2 Agriculture

Several row crop/orchard farms were identified to be located within and to the east of the Precinct along Doyles Road. Use of chemical sprays at these farms have the potential to result in 'spray drift' which can be harmful to surrounding sensitive land uses.

A 40m spray drift separation distance is recommended to be applied to active orchards and farms located within and adjacent to the precinct.

Active orchards – A 40m spray drift separation distance is recommended between any new sensitive development and active orchard uses within the precinct, until a time in which the orchard uses transition out of the precinct.

Shepparton East Farming – A 40m spray drift separation distance was recommended between any new sensitive development and farms outside of the precinct to the east of Doyles Road. This will encroach slightly to the eastern edge of the precinct. • Doyles Road future duplicated road reserve and proposed PSP frontage road running the extent of the PSP's eastern boundary provides a separation distance greater than 40m between farming zoned land to the east of Doyles Road and proposed residential development, overall mitigating potential impacts. Cross Section 5 of the PSP outlines the intended interface arrangement.

Recommendations have been responded to in the following manner:

- A 40m spray drift separation distance will need to be considered within the precinct associated with any new sensitive development abutting ongoing orchard uses until which time the orchard ceases operation and transitions out of the precinct. Section 4.6 of the PSP (Interface Areas) provides guidance as to how future permits are to manage this.

8.3.3 Transport

Residential areas are proposed to the west of Doyles Road reserve and may be subject to air quality impacts from vehicle emissions.

The report recommends a 20m setback for sensitive development from Doyles Road to mitigate impacts of traffic pollutants, this will allow for the best outcome for the health and wellbeing of future precinct residents.

This separation distance is based on the Brisbane City Council policy (as there is no current Victorian policy) which outlines that a setback distance of 20m is appropriate. This setback has informed preparation of the PBP, PSP and planning controls.

Recommendations have been responded to in the following manner:

- The PSP outlines the Doyles Road interface as a sensitive interface with no sensitive development to establish with in 20m of the Doyles Road reserve.
- Road cross section 5 has been developed to demonstrate how future development must be setback in accordance with recommendations as outlined in the PSP.

8.4 Noise Assessment

GHD was commissioned in 2022 to prepare a *Noise Amenity Impact Assessment* to assess potential sources of adverse impacts in relation to noise and vibration emissions to ensure any off-site adverse amenity is managed.

8.4.1 Industry

An Industrial 1 Zone is situated adjacent to the northern boundary of the PSP, for which a 300 metre noise influence area applies. It's important to note that the current use of this land is associated with the East Shepparton Bowls Club and it's zoning is considered an anomaly. Realignment of the zoning to better reflect current use will be the subject of a future planning scheme amendment process run by Council for the area known as the Zurcas Lane Investigation Area as detailed in section 3.3 of this document.

However, until that time it is recommended a detailed external noise intrusion assessment be prepared by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that internal noise levels achieve recommended noise amenity targets.

There are two active industries within the PSP of note:

Rendevski Transport, of which the following noise impact areas and recommendations apply:

- 50 metre noise impact area should the Precinct remain as a Farming Zone.

- 140 metre noise impact area should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol.
- Preparation of a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that noise emissions from the commercial premises achieves the Noise Protocol noise limits at the proposed site.

JDK Cold Storage Warehouse, for which the following noise impact areas and recommendations apply:

- Should JDK Cold Storage Warehouse pursue the facility upgrades as per Planning Permit 2020-7 and Planning Permit 2020-103, it is expected that they will fulfil their obligations and implement the recommendations outlined in Marshall Day Acoustics' acoustic report submitted as part of the permit application to meet the relevant environmental noise criteria. As such, no noise impact area would apply.
- Should JDK Cold Storage Warehouse not pursue the facility upgrades, the following has been established:
    - No noise impact area should the Precinct remain as a Farming Zone.
    - Noise impact area as outlined in figure 8 of the GHD report should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol.
    - Preparation of a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that noise emissions from the commercial premises achieves the Noise Protocol noise limits at the proposed site.

Recommendations have been responded to in the following manner:

- Section 4.6 Interface areas has been included in the PSP and outlines identified impacted areas and includes a Requirement for an acoustic assessment to be undertaken for development areas impacted.
- An application requirement has been included to the schedule to the UGZ requiring an acoustic assessment for sensitive development within the recommended area at the discretion and to the satisfaction of the responsible authority.

8.4.2 Agriculture

Agriculture noise sources including diesel water pumps, frost fans and scare guns, for which the following potential noise impact areas and recommendations have been established:

- Residential dwellings within 1,000 metres of any agricultural land where frost fans are found to be used, should be required to undertake a detailed noise impact and risk assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the EPA Guideline 1043.1 recommended noise levels.
- The assessment could not definitively establish which farming properties employed the use of frost fans, diesel pumps or scar guns which are all seasonal and intermittent use.

This recommendation has been responded to in the following manner:

- Section 4.6 Interface areas has been included in the PSP and outlines identified impacted areas and includes a Requirement for an acoustic assessment to be undertaken for development areas impacted.
- The schedule to the UGZ includes an application requirement for an acoustic assessment for sensitive development within the recommended area at the discretion and to the satisfaction of the responsible authority.

8.4.3 Transport

Traffic noise sources including Doyles Road, for which the following potential noise impact areas and recommendations have been established:

- 70 metre noise impact area from Doyles Road.
- Preparation of an external noise intrusion assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the development is designed and constructed to achieve recommended noise amenity targets.

Recommendations have been responded to in the following manner:

- Section 4.6 Interface areas has been included in the PSP and outlines identified impacted areas and includes a Requirement for an acoustic assessment to be undertaken for development areas impacted.
- The schedule to the UGZ includes an application requirement for an acoustic assessment for sensitive development within the recommended area to the satisfaction of the responsible authority.

9 GOULBURN MURRAY WATER ASSETS

9.1 Irrigation Channels and Drains

The site contains numerous Goulburn-Murray Water (GMW) assets consisting of irrigation supply channels and drains (Figure 5). It is of the view of GMW that it is not appropriate for urban lots to be connected to a rural water supply, and therefore these assets will no longer be suitable in the area as development progresses. The irrigation channels for rural supply within the precinct will be decommissioned, to the satisfaction of the responsibility authority, as the precinct develops into an urban landscape. The decommissioning of any drains will need to be undertaken under both an umbrella Memorandum of Understanding (MOU) between GMW and Council, and an MOU specific to the relevant subdivision proponent. In any circumstances where intersection or bridge works are required to cross GMW infrastructure, a 'Construction and Use of Private Works Licence' from GMW would be required prior to commencement of the works.

Majority of the land within the precinct is serviced with rural water from GMW and therefore holds water delivery shares. The proponent of any subdivision on this land will need to make an application to GMW pursuant to sections 224 and 229 of the *Water Act 1989* to terminate or transfer the delivery shares in relation to the property and make a declaration that the property cease to be serviced.

The GMW drains (No. 2 Drain) bringing flows from the eastern rural areas will need to be retained under GMW ownership and have continued service in some form as the site develops, as these flows currently traverse in a westerly direction and ultimately south where they outfall to the Broken River. Further to this, the existing residential areas bounding the western side of the precinct currently outfall into Drain 2 via retarding basins.

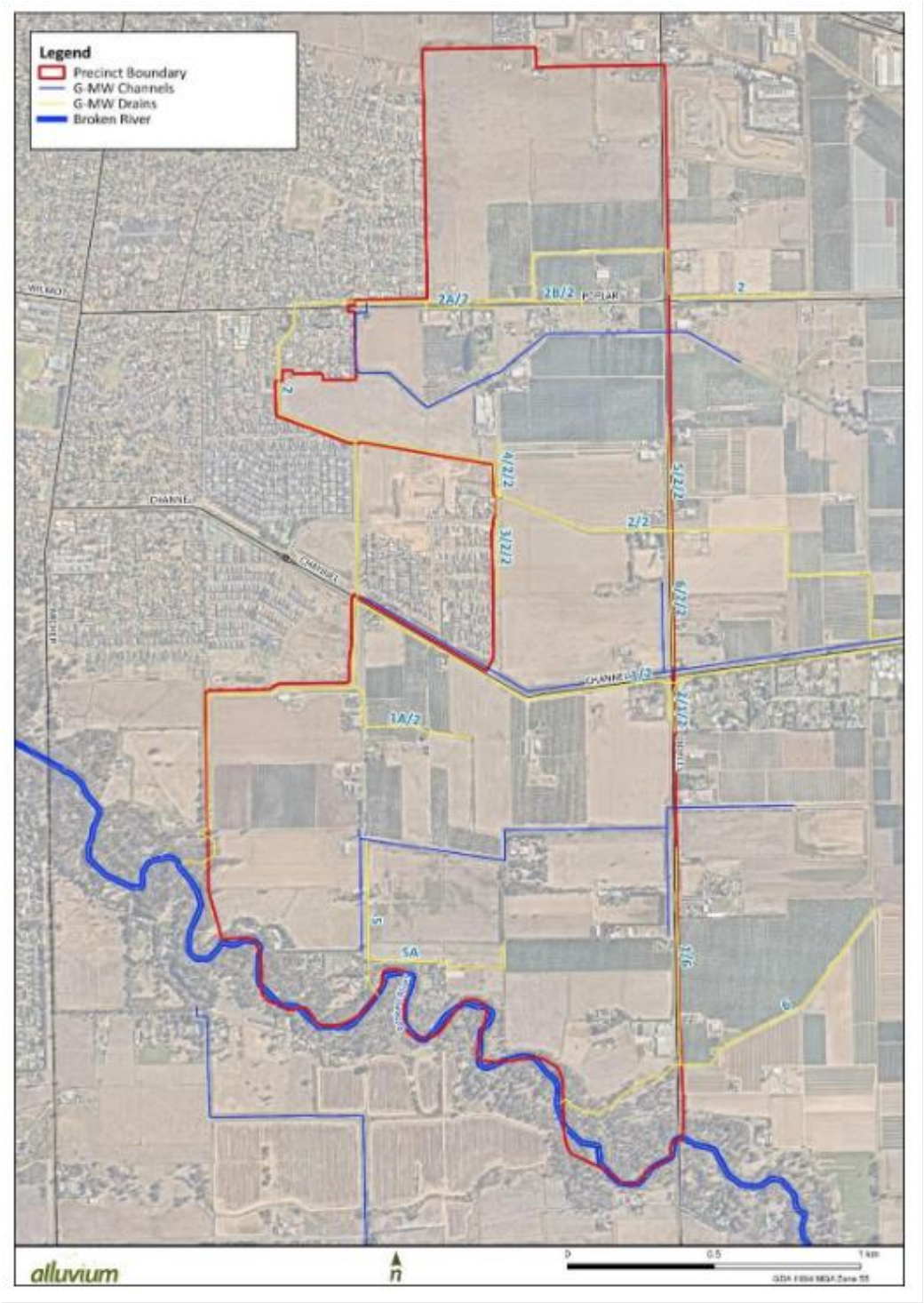
The continued service of these drains and GMW's discharge requirements into these drains (1.2L/s/ha) greatly influenced drainage options for this precinct.

Under a developed scenario, the existing channels and drains will be intersected by the precinct development and new drainage assets. There is an opportunity for collaboration between GMW and Council in relation to the design of any piped, converted or upgraded drains. It is critical that the decommissioning, realignment or conversion (drains to pipes) of these assets takes place in accordance with GMW requirements to minimise impacts on neighbouring customers.

Recommendations have been responded to in the following manner:

- The two GMW irrigation channels within the precinct will be decommissioned as development occurs, and staged in a manner that will not impact transition agricultural uses within the precinct. Decommissioning will be the responsibility of the proponent.
- GMW Drain 2 will remain in situ in the precinct within its existing easements, proposed to be treated as a future waterway interface. Road cross section 6 has been developed to demonstrate how future development must be setback in accordance with GMW recommendations to Drain 2 as outlined in the PSP.
- The remaining drains will be transitioned to piped assets as development occurs and aligned with key infrastructure as outlined on Plan 12 Integrated Water Management in the PSP. Upgrading drains will be the responsibility of the proponent.
- The GMW easements associated with any retained or newly piped drains will need to be taken into consideration as part of future detailed design.

Figure 7: Existing GMW assets



10 STORMWATER STRATEGY AND INFRASTRUCTURE

Alluvium Consulting (Alluvium) was engaged in 2022 to prepare the *Stormwater Strategy and Functional Design Report* and associated cost estimates for DCP. Prior to this, two previous drainage strategies were developed and tested for the PSP by Spiire (2012) and Cardno (2020). All strategies have informed the final functional design and costings as prepared by Alluvium and included in the PSP and DCP.

Due to the particularly flat topography, the number of GMW drains and channels and the relatively high-water table, stormwater drainage represents a challenge to the development of land in the precinct.

All stormwater drainage assessment's undertaken for this PSP have employed the GBCMA endorsed flood modelling to inform their assessment and infrastructure designs. The Alluvium assessment employs the same flood modelling (including climate change scenario) data as outlined in section 7.1 of this report. Spiire was engaged by Council in 2012 to develop a drainage strategy for the precinct. Several iterations of the proposed design resulted in a series of retarding basins which outfall either directly to the Broken River, or to GMW drains. The designs were developed into functional designs with associated costs estimates. Spiire delineated six sub catchments within the precinct based on contours and existing GMW assets (drains) for outfall. Cost associated with delivery of the infrastructure required to deliver the strategy led to an alternative strategy being explored.

To reduce infrastructure costs, Cardno were subsequently engaged by the VPA in 2020 to test an alternate stormwater drainage option which focussed on a constructed waterway strategy for the PSP. The concept identified several wetland/retarding basins, as well as a network of waterways throughout the PSP. The Cardno report was only developed to a conceptual level, with outcomes that suggested similar costs for delivery to the Spiire retarding basin strategy option, however a much higher land take requirement (noting that the Spiire strategy was developed to a functional level whereas the Cardno strategy only to a conceptual level).

Alluvium undertook a peer review of the Spiire and Cardno options and proposed the following recommendations that have informed the final strategy:

- Although new constructed waterways provide an opportunity for blue-green corridors, this approach is likely more expensive and results in a greater land take than a basin approach. Given this precinct is constrained by costs, a basin approach is deemed more feasible in this instance. Multi-objective outcomes (improved amenity, biodiversity, recreational opportunities, cooling and health outcomes, and the option for future stormwater harvesting) can be provided through well-designed treatment/retarding basins which are connected to surrounding communities.
- A retarding basin option provided the most cost-effective strategy for the PSP given Drain 2 will need to remain in a post-development scenario to service existing residential areas to the west of the precinct. Utilising this existing GMW drain rather than constructing a new waterway was recommended, with potential to provide a blue-green corridor via the Drain 2 asset.

The Alluvium strategy features six retardation basins, one located within each drainage sub-catchment based upon the following:

- Drainage of each catchment is proposed to be via a gravity piped system to outfall to a retardation basin sized to cater for the storage requirements. As part of the hydrologic modelling, a sensitivity check of a climate change scenario was undertaken for retarding basin sizing.
- Overland flow can be directed to the retardation basin via the existing and proposed local road network.
- The proposed retardation basins have been located at the lowest point in each catchment and located close to the GMW drains where each catchment will ultimately outfall. These design considerations minimise the size and length of drainage infrastructure.
- Development will not necessarily occur in a linear upstream-downstream sequence ('out of sequence development'). Given the precinct is proposed to be serviced by a number of retarding basins and not waterways, this allows a certain degree of flexibility in terms of staging.
- Where possible, the basins have been located entirely within a single parcel of land, which will help with more efficient implementation of the drainage strategy. Development staging must provide for early delivery of ultimate drainage infrastructure including stormwater quality treatment. Where this is not possible, development must demonstrate how any interim solution adequately manages and treats stormwater generated from the development and how this will enable delivery of an ultimate drainage solution, all to the satisfaction of the responsible authority.
- Preliminary MUSIC modelling determined that the treatment requirements for each catchment can be achieved via the installation of a wetland system within each proposed retardation basin.
- The GBCMA have been consulted with upon the proposed strategy and have provided the following requirements that must be considered in future detailed development of stormwater drainage assets:
    - Any stormwater assets must not be located within 50m of the top of the bank of the Broken River within the floodplain area as this could have potential geomorphic consequences created by lateral migration of the river channel impacting the integrity of the asset.
    - Ideally, pits (retarding basins) should be at least one-metre above the river channel invert, located on higher terraced floodplain areas, be no closer than 1000 metres to any critical infrastructure (such as gas mains), be inherently stable, and be maintained.

Recommendations have been responded to in the following manner:

- The Integrated Water Management section 4.7 of the PSP outlines the future stormwater drainage layout, comprising six retarding basins discharging into GMW drains.
- Funds to purchase land and construct six retarding basins has been included within the DCP.
- The Public Acquisition Overlay (PAO) will be applied to land required for all six retarding basins to enable Council to acquire the land and support implementation of the drainage strategy within a fragmented land context.

11 TRANSPORT NETWORK AND INFRASTRUCTURE

Stantec was commissioned to prepare a *Transport Impact Assessment Report* (TIAR) to inform the preparation of the Shepparton South East PSP in 2018 (revised July 2023). The assessment confirmed the transport network required to support the future development of the PSP and infrastructure to be funded by the DCP.

11.1 Road Network

The ultimate road network must provide for safe and efficient movement for pedestrians, cyclists, buses, cars and trucks.

The proposed precinct road network layout utilises and builds upon the existing road network within and around the precinct. The vehicle movement numbers in Table 1: PSP Road network hierarchy and classifications give an indication of the traffic generation expected for these roads at ultimate build out. Table 1: PSP Road network hierarchy and classifications shows the outcomes and recommendations of road classifications made by Stantec. As evident in the table and acknowledged in the TIAR, modelling has revealed that the proposed road network has the capacity to accommodate the trips generated by the future community. Upgrades and widening of existing road reserves will be required to transition existing roads from rural to urban development standards.

VPA has adopted each of the Stantec Table 1 road typology designations, with the exception of Channel Road between Doyles Road and Feiglin Road. This section has been assigned in the PSP as a Connector Street typology (rather than Connector Boulevard) in response to the current road reservation width and capacity considerations. i.e. mid block capacity along this section of Channel Road will be determined by the capacity of the intersection treatment at Doyles Road, which has been assessed by Stantec as sufficient for the forecast traffic volumes through the intersection. On balance, the Connector Street typology for Channel Road east of Feiglin Road is considered suitable to meet functional and amenity requirements.

Table 1: PSP Road network hierarchy and classifications

Road	VPA Road Classification and Description	Planning Scheme Road Classification	Expected Daily Traffic Volumes	Target Traffic Volumes
Zurcas Lane	Connector Street – Boulevard One 3.5m traffic lane and 2.1m indented parking lane in each direction, separated by a 3-6m median. Footpaths on both sides and a bidirectional off road bike path on one side.	Connector Street Level 2	5,600vpd	3,000 - 7000vpd
Channel Road between Doyles Road and Feiglin Road		Connector Street Level 2	8,800vpd	3,000 - 7000vpd
Channel Road between Feiglin Road and McPhees Road	Connector Street One 3.5m traffic lane and 2.1m indented parking lane in each direction. Footpaths on both sides and a bidirectional off road bike path on one side.	Connector Street Level 1	7,100vpd	3,000vpd
Poplar Avenue between Feiglin Road and Streeton Drive		Connector Street Level 1	3,950vpd	2,000 - 3,000vpd
Poplar Avenue between Doyles Road and Feiglin Road		Connector Street Level 1	2,300-2,500vpd	2,000 - 3,000vpd
Feiglin Road between Poplar Boulevard and Channel Road		Connector Street Level 2	7,150vpd	3,000 - 7,000vpd
Feiglin Road south of Channel Road		Connector Street Level 1	8,500vpd	3,000 - 73000vpd

11.1.1 Shepparton Alternative Route – Doyles Road

The PSP is bounded by Doyles Road (C391) to its east, which functions as an arterial road and is part of the Shepparton Alternative Route (SAR). In its current form it features a two-lane carriageway (one lane in each direction) with localised widening at some intersections to provide for right turn deceleration lanes. Doyles Road currently carries approximately 8,000vpd (26% heavy vehicles) between the Midland Highway and the Dookie-Shepparton Main Road (New Dookie Road). By 2031, it is predicted that this figure will increase to 13,000vpd.

The SAR forms a key link within the Major Roads Projects Victoria (MRPV) Bypassing Shepparton program, which will see this immediate section of Doyles Road adjacent to the PSP duplicated to a

four-lane carriageway (two lanes in each direction). It is understood that the primary driver for duplication of Doyles Road is its role and function for the movement of freight which is documented in the "Bypassing Shepparton Business Case" submitted to Department of Transport and Planning (DTP) by MRPV in December 2020. Given the traffic demand outlined in Table 1, the development of the PSP in isolation is not considered to be sufficient to warrant the duplication of Doyles Road.

Doyles Road will continue to function as a key transport linkage for the future PSP road network accessed via the two existing connections of Poplar Avenue and Channel Road. DTP have advised that no additional direct road access from the precinct onto Doyles Road should be created.

DTP's preference is to not apply a Public Acquisition Overlay to this land as part of the VPA Planning Scheme Amendment process and to instead explore implementation at a later stage. Therefore, the land will be reserved within the PSP's land budget only and removed from the net developable area calculations.

Recommendations have been responded to in the following manner:

- Land will be identified at the eastern boundary of the PSP to accommodate the proposed duplication of Doyles Road as directed by DTP and be removed from the net developable area of the PSP's Land Budget.
- DTP will lead the future process to apply the Public Acquisition Overlay to acquire land required to deliver the future arterial road duplication.

11.2 Intersections

Assessments of a select number of intersections was undertaken as part of the TIAR to determine the suitability of the proposed road network with the expected 2031 post-development traffic volumes. The selection of these intersections has been completed in partnership with Council and the DTP.

The assessment found that intersections are generally in accordance with the planning guidelines for connecting arterial and/or connector roads in the context of a PSP. The purpose of assessing the performance of the intersections within and connecting to the PSP is to provide guidance into determining the cost and any apportionment of constructing them and informing the associated DCP.

The internal local road intersections of the PSP can be suitably serviced by roundabouts. This category of intersection is generally considered a developer work and not included within a DCP. However, in this instance Council have requested the inclusion of all internal intersections as necessary to facilitate their future delivery. Apportionment of Archer Road internal intersections is also being applied in this circumstance due to s173 agreements that Council have previously entered into with adjoining development of the area. Apportionment of internal intersections is outlined below. Cardno originally prepared designs and costs for all internal intersections included in the DCP in 2019, Spiire has undertaken a review of these costs in 2023 with outcomes included in the DCP.

Regarding interfacing intersections with the surrounding road network, the existing intersection types will generally be maintained, except for those on Doyles Road and Archer Street. The specific intersection treatments are discussed in section 11.2.1 and 11.2.2 below.

11.2.1 Poplar Avenue and Channel Road intersections with Doyles Road:

The design of the two access intersections for the PSP at Poplar Avenue and Channel Road have been through a rigorous consultation process with GSCC, VPA and DTP. Outcomes of which sought to

agree on the intersection requirements and minimum design standards that would be required for the PSP as well as the broader requirements for the SAR as a strategic transport link.

General agreement was reached on a proposed layout and arrangement for the Poplar Avenue and Channel Road intersections with Doyles Road with DTP as follows:

- Provide for Left-In / Left-Out only movements at the Doyles Road / Polar Avenue intersection.
- Provide a roundabout controlled intersection at the Doyles Road / Channel Road intersection. DTP provided VPA a concept roundabout design for inclusion and that has formed the functional design and costing included within the DCP.
- The roundabout intersection design be prepared so that it matches into the existing two lane carriageway with suitable deflection on the north and south approaches for the anticipated design vehicles, the 80km/h speed zone and a urban-rural interface environment. The design also seek to:
    - maximise the use of existing infrastructure and align with the design guidance provided by DoT as far as practical.
    - be Safe Systems compliant with the design solution to include a solution to reduce the speed of vehicles prior to entering the intersection.
- The intersections have been designed to conform with Road Design Note 04-01 –Heavy Vehicle Network Access Considerations.
- The length and size of traffic islands must comply with Austroads standards along with lane widths and braking zones.
- DTP have also requested a lot cap provision be included in the UGZ for the PSP to ensure that the delivery of the intersections occur inline with intersection failure rates. Both the Poplar Avenue and Channel Road intersection must be delivered simultaneously to ensure functionality of the freight network. A lot cap of 800 lots will be included in the UGZ in line with Stantec's assessment for the delivery of both intersections.
- To ensure that the DCP has sufficient revenue to deliver the Poplar Avenue and Channel Road intersections with Doiyles Rd in line with the lot cap, the two intersections have been identified in the DCP for Early Developer Works. This identification will cover Council for any financing required to deliver the intersections in the requested timeframe.

Recommendations have been responded to in the following manner:

- Intersections to be identified in the PSP and included for land and construction in the DCP:
    - left-in left-out for the intersections of Poplar Avenue and Doyles Road.
    - four leg roundabout for the intersection of Channel Road and Doyles Road.
    - 800 dwelling lot cap has been included in the UGZ to support the timely delivery of the Poplar Avenue and Channel Road intersections with Doyles Road.
- Early Developer Works for IN-01 and IN-03 have been included as a separate line item in the DCP.

11.2.2 Channel Road intersection with Archer Street

The Archer Street / Channel Road intersection currently operates under give way control, with priority given to the Archer Street movements. The increase in traffic movements and the interaction with

pedestrians will result in the need for it to be upgraded to a signalised intersection. This will afford the precinct with the ability to remove the existing zebra crossing facility on Archer Street to the north of Channel Road. To maximise the use of the shared path along the northern side of Channel Road, crossing facilities on the northern approach are recommended.

Apportionment has been recommended for this intersection as existing traffic demand and broader network growth will contribute to the need for the upgrade. Based upon SIDRA analysis presented in the TIAR and summarised in Table 2 below, it is recommended that 33% of the future intersection's upgrade be apportioned to the PSP and collected through the DCP.

Recommendations have been responded to in the following manner:

- Archer Street T intersection upgrades to be identified in the PSP and 33% apportioned funds included for construction in the DCP:

Table 2: Transport Impacts Assessment Sidra Analysis – Archer Street Intersection Apportionment Analysis (Stantec, March 2022)

Approach	SSE PSP (future traffic - existing traffic)	Other (existing traffic)	SSE PSP (future traffic - existing traffic)	Other (existing traffic)	SSE PSP (future traffic - existing traffic)	Other (existing traffic)	SSE PSP Percentage of Total Traffic
	AM Peak		PM Peak		Total (AM & PM Peak)		
North (Archer St)	87	216	334	583	421	799	35%
East (Channel Rd)	182	170	145	155	327	325	50%
South (Archer St)	92	405	143	423	235	828	22%
TOTAL	361	791	622	1161	983	1952	33%

11.2.3 Zurcas Lane/Poplar Avenue/Feiglin Road and Channel/Feiglin Road

The intersections of Zurcas Lane/Poplar Avenue/Feiglin Road and Channel/Feiglin Road have also been considered for apportionment due to GSCC having already collected funds from adjoining development towards the delivery of the intersections.

Recommendations have been responded to in the following manner:

- Zurcas Lane/Poplar Avenue/Feiglin Road intersection upgrades to be identified in the PSP and 98% apportioned funds included for construction in the DCP:
- Channel/Feiglin Road intersection upgrades to be identified in the PSP and 98% apportioned funds included for construction in the DCP:

Table 3: Internal Intersection Apportionment – Source GSCC

Intersection	Cost (2015$)	% collected	Monies already collected	Cost (2023$)	Monies remaining in 2023$	% apportioned to the DCP
Zurcas Lane/Poplar Avenue/Feiglin Road	$200,000	16.6	$33,200	$1,719,039	$1,685,839	98
Channel/Feiglin Road	$200,000	15.1	$30,200	$1,776,122	$1,745,922	98

11.3 Pedestrian Operated Signals

Through consultation Council, DTP and Department of Education (DE) outlined the existing and interim need to ensure there is a safe crossing point across Doyles Road connecting the precinct residents west to the Orrvale Primary School.

Though there will be a future primary school located within the Precinct, there may be an interim need to service resident access to Orrvale Primary School until the time in which the new school is built .

Four options were explored and consulted upon with Council and DTP::

- Signalised intersection at Doyles/Channel Road.
- Overpass connecting the precinct over Doyles Road.
- Underpass connecting the precinct under Doyles Road.
- Pedestrian operated signals connecting the precinct across Doyles Road.

DoT were not supportive of the signalised intersection at Doyles/Channel Road as it was considered that the intersection would impact the freight function of the road. The overpass option was considered highly cost prohibitive due to the large scale of the road and clearance needed. The underpass was not considered viable due to the high water table of the area. As such the pedestrian operated signals was seen as the most viable alternative.. DTP have provided in principle support for a pedestrian operated signals inclusion within the DCP.

Given the uncertainty of the future location of the crossing VPA Benchmark Costing has been applied to the pedestrian operated signal included in the DCP.

Recommendations have been responded to in the following manner:

- The PSP will identify a potential location for the future delivery of the pedestrian operated signal across Doyles Road and include funds for construction in the DCP.
- The future location of the pedestrian operated signals is subject to detailed design and outcomes of a road safety audit.

11.4 Public & Active Transport

Stantec as part of their TIAR undertook an assessment of the proposed road cross sections to determine the suitability of the proposed road network to facilitate public and active transport linkages.

11.4.1 Public Transport

There are no public transport services currently operating within the PSP. However, Shepparton Transit runs a bus service to the north-west outside of the study area, which runs along Archer Street, and loops back with a number of stops along the way. There is also a V/Line operated train service that departs from Shepparton station, approximately 2km from the precinct.

Recommendations have been responded to in the following manner:

- All connector roads within the PSP are proposed to be bus capable. With the inclusion of Doyles Road 89% of residents will be within a 400m walking distance to a bus capable street.

11.4.2 Active Transport

The principal bicycle network extends into the PSP via Zurcas Lane, Poplar Avenue and Channel Road which aligns with the primary road network proposed within the PSP. All interfacing urban development with the PSP is considered to have good walking and cycling facilities for the PSP to connect into.

Recommendations have been responded to in the following manner:

The PSP proposes the following active transport facilities:

- Footpaths will generally be provided on both sides of the roads within the precinct, with exception of roads that abut parks as demonstrated in cross section 7 of the PSP.
- All connector roads will include shared paths on both sides of the road as demonstrated in cross section 2 of the PSP.
- Boulevards to include separated cycle lanes as included in cross section 1 of the PSP.
- Shared pedestrian and cycle path along the Broken River connecting in with shared paths of the proposed internal road network. This has been included in the PSP and DCP for collection of funds to construct the path as its construction will not be able to be delivered as part of standard subdivision due to its location.

Walking and cycle paths will also be included as part of local parks and the Broken River corridor. It is expected that the on-road traffic volume and speed environments on the other streets in the study area will generally be consistent with the VicRoads 'Design Guidance for Strategically Important Cycling Corridors'. This is considered to provide a suitable level of access for pedestrians and cyclists of all abilities.

12 COMMUNITY INFRASTRUCTURE AND EDUCATION

ASR research were commissioned to undertake an update to the Shepparton South Community Infrastructure Needs Assessment (May, 2022). The assessment identified demand for community infrastructure generated by residential development in Shepparton South and assessed the capacity of existing and planned infrastructure and gaps in infrastructure provision. While this report deals with the broader South Shepparton area, the PSP is a major component of this. The report recommends both facilities internal and external to the PSP that need to be developed or upgraded to accommodate the PSP. Recommendations of this assessment have been employed in the preparation of the PSP and DCP.

12.1 Community Facilities

There are currently no community or education facilities within the PSP. The PSP borders the existing limit of residential development to the east of Shepparton and given the presence of existing east-west links traversing through the area, is in close proximity to a range the existing facilities and services in south Shepparton and the CBD.

Notably:

- V. E. Vibert Reserve
- East Shepparton Bowling Club
- Retirement villages of Harmony Villages, Shepparton Lifestyle Villages' and Kensington Gardens.

Access to existing services and facilities of the area have been considered in identifying needs for additional community infrastructure to service the future PSP community.

Table 4: ASR Community Infrastructure recommendations

Item	Shepparton SE PSP Demand	South Shepparton Demand	Proposed Facilities in SSE PSP
3 and 4 yo kindergarten (child)	175	626	Multi-purpose children's centre –3-4 playrooms, 2 room M&CH centre, activity spaces
M&CH (session)	7	24	Multi-purpose children's centre –3-4 playrooms, 2 room M&CH centre, activity spaces
Occasional care (place)	22	28	Multi-purpose children's centre –3-4 playrooms, 2 room M&CH centre, activity spaces
Multipurpose community centre	0.20	0.73	Optimal use and expansion of the Vibert Reserve
Long Day Childcare (Places)	126	454	Multi-purpose children's centre –3-4 playrooms, 2 room M&CH centre, activity spaces

Recommendation have been responded to in the following manner:

- The PSP identifies a 0.6ha site for the future development of a multi-purpose children's centre adjacent the proposed primary school and local convenience centre.
- Funds for land and construction of the future multipurpose children's facility have been included in the DCP.

12.2 Active Recreation

There are 13 active recreation reserves in Shepparton City. These reserves accommodate a range of playing fields (e.g.,soccer, cricket, hockey and equestrian). The largest reserve is the multi-faceted Shepparton Sports Precinct. It contains 11 playing fields including regional soccer and hockey venues. Deakin Reserve is the major football/cricket venue in Shepparton City. In addition to the 13 active reserves, there are 5 (and soon to be 6) schools in Shepparton City that have playing fields which are suitable for junior sport and, at some venues, senior sport.

There is one active recreation reserve in Shepparton South – V. E. Vibert Reserve. The reserve is adjacent to the playing field at the former McGuire Secondary College Site. The Reserve plus the playing fields occupy 9ha. There are 4 playing fields on this 10ha site – 2 football/cricket and 2 soccer/cricket.

GSCC's Sports 2050 Plan (draft) identifies that there is sufficient supply of fields across Shepparton City to meet current and future soccer and cricket demand. The Plan indicates that more capacity may be required for football.

Across South Shepparton ASR have identified a need for approximately 21ha of active recreation space is required across South Shepparton. There is currently 10ha that offer 4 cricket, 2 football and 2 soccer fields.

Schools in the vicinity of the PSP provide varied access to sports facilities:

- McGuire College and Wilmot Road Primary School have shared access with V.E. Vibert Reserve.
- St George's Road Primary School contains a sports oval and Sports and Arts Centre.
- Orrvale Primary School has limited facilities and land.

It has been recommended that the PSP provide the following active recreation facilities:

- One senior size football/adjoining the school site with, lights, pavilion, playground and ancillary facilities. This will require an area of 4ha.
- Two senior size soccer fields with, lights, pavilion and ancillary facilities (at or adjoining the school site). This will require an area of 2-3ha.

Recommendation have been responded to in the following manner:

- 6-7ha sports reserve identified within the PSP to accommodate one senior size football oval and two senior size soccer ovals with, lights, pavilion, playground and ancillary facilities adjacent the proposed future primary school site.
- Funds for land and construction of the future sporting facility be included within the DCP.

12.3 Education

Government Primary Schools in the area include Wilmot Road Primary School, St George's Road Primary School and Orrvale Primary School. Secondary schools in the area include Greater Shepparton College. There are also a range of non-government Primary and Secondary schools

With a projected population of around 6,000 new residents, this will likely require a new Primary School to be developed within the PSP. DET have advised they are in support of the identification of a new P-6 Primary school within the precinct.

The proposed primary school has been situated to align with DET/VSBA *School Siting Guidelines* and take on board the provisionally approved name of Shepparton Aqueduct P-6 as part of the PSP.

The Victorian Government has recently made a commitment to the future funding of Pre-Prep. This will build on earlier commitments to Three-Year-Old Kindergarten and will need to be considered as part of planning for a future community facility within the precinct.

Recommendations have been responded to in the following manner:

- The PSP includes a 3.5ha site for the proposed Shepparton Aqueduct P-6 Government Primary School, in line with key siting criteria as established via the *School Siting Guidelines*.

12.4 Proposed State Government Health Facility

The VPA consulted the Department of Health (DH) through the Agency Validation process, to assess the need for land to provide for a health facility within Shepparton South East precinct. The DH

identified an opportunity within the Shepparton South East precinct to deliver a new capital health project in Shepparton. DH have requested a site in the northern extent of the precinct, in close proximity to the Shepparton Marketplace, a regional retail hub, and adjacent existing retirement villages of the area.

Timing of the delivery of the facility will be subject to determination of DH.

Recommendations have been responded to in the following manner:

- The PSP includes a 0.6ha site for the proposed State Government Health Facility on Zurcas Lane, in line with general site parameters provided by Department of Health.

13 RETAIL AND EMPLOYMENT

Tim Nott was commissioned to undertake an *Activity Centres and Employment Assessment* for the PSP in September 2013. This Assessment was tasked with reviewing the activity centre network and employment land in the PSP area.

The assessment found that by 2031 the population of South East Shepparton will grow by 3,312 people, reaching a population of 9,174. This will require 6,000 sq m of neighbourhood or local centres within the region. Although some of this demand would be satisfied by existing neighbourhood centres such as Shepparton Plaza, and existing local centres west of Archer Street, there is sufficient demand for one new small neighbourhood centre and one group of local shops within the PSP area.

The new small neighbourhood centre would be 1 hectare in size and cater for a population of 5,000 people. The neighbourhood centre should comprise of:

- A supermarket of 1,800 to 2,200 sq m.
- Speciality shops providing convenience goods and services (eg. pharmacy, newsagent, bakery, take-away food, hairdresser).
- Non-retail floor space of 1,310 sq m (eg.medical facilities, shop-front services, offices, gyms, minor community facilities).
- Car parking of 5,760 sq m.
- The assessment recommended that the new neighbourhood centre should be located on Channel Road or Feiglin Road, based on the criteria that the new neighbourhood centre should:
    - Be on a significant road within the growth corridor – a collector road such as Channel Road, Popular Road or Feiglin Road.
    - Should be as far away as possible from competing facilities, such as Shepparton Marketplace, Shepparton Plaza and Riverside Plaza.
    - Should be central to the community in order to encourage walking and cycling by catchment residents.

Ethos Urban was engaged in 2022 to review the retail requirements for the precinct, in light of Council's *Commercial Activity Centres Strategy* which was adopted in November 2015.

A supermarket assessment considering the opportunity and need for a supermarket in the precinct, taking into consideration the trade area it will serve and the competitive context, found that potential exists for a supermarket in the order of 2,000m2 to 2,500m2 in floorspace at capacity of the trade area.

Customer traffic and exposure generated by a supermarket was considered able to support a number of specialty retail shops. Specialty retail floorspace of 1,000m2 to 1,250m2 could be supported. In addition to retail floorspace, the activity centre can accommodate a range of non-retail shopfront businesses. 500m2 to 700m2 of commercial floorspace could be supported.

In total, the activity centre could support floorspace of approximately 3,500m2to 4,500m2, including both retail and commercial floorspace. A land budget of approximately 1.2to 1.5ha of land would be required to accommodate an activity centre of this size.

Recommendations have been responded to in the following manner:

- The PSP identifies a 1.5ha area identified for the future delivery of a local convenience centre and includes guidance around its future layout via the Local Convenience Centre Concept Plan at figure 1 of the PSP.
- Section 4.2 of the PSP includes requirements and guidelines in addition to design principles for consideration by future development appendix 5.2.

14 PASSIVE OPEN SPACE

Hansen Partnership have employed recommendations of the Shepparton South Community Needs Assessment to recommend a future local park and passive open space network within the PSP.

There are no existing designated public open space areas within the PSP. This is due to the historical private ownership of the land for agricultural purposes.

There are eight small open spaces, or pocket parks, in the existing residential area in Shepparton South East, to the west/northwest of the study area. These spaces serve only a local catchment, and several are also used for stormwater retardation.

ASR's CINA recommended 5-6 new play spaces be accommodated within the precinct.

The Broken River is key natural asset, with opportunities for passive recreation and active transport links, via trails and shared paths. Though this land is encumbered, it will provide unique passive recreation opportunities for the future community.

Council have requested that collection of local parks not be facilitated via Cl53.01, but rather that funding for land and construction be included as part of the DCP. Provisions under Cl53.01 will be turned off in this instance. Council have also requested a PAO be applied to all land identified for a local park within the precinct as necessary to facilitate their future delivery.

Recommendations have been responded to in the following manner:

- 5 Local parks and 1 linear open space have been included in the PSP. All local parks are able to cater for a playground, while providing opportunities for other passive recreation. Parks range in size from 1.0ha to 2.72ha.
- The Broken River will feature a proposed shared path connection, linking key roads containing bike and shared paths in the precinct.
- Funds will be collected for land and construction of 6 local parks via the DCP.

15 SERVICING AND UTILITIES

GHD was commissioned to undertake a Utilities Servicing Assessment in September 2021. This assessment aimed to conduct a review of existing servicing infrastructure within and in proximity to the precinct and to determine potential future servicing needs.

The assessment found that:

Water

- Redevelopment in the precinct will likely trigger upsizing of existing water assets (both within and outside the precinct), including trunk water mains, storage tanks and booster pump stations.
- The cost of trunk/distribution water infrastructure is attributed to Goulburn Valley Water, and the cost of reticulation mains will be attributed to the development contributions.
- Goulburn Murray Water (GMW) manages a number of existing rural/irrigation water assets in the precinct, including water supply channels, pipelines and drainage assets.
- Where appropriate, GMW seeks the conversion of rural infrastructure to pipelines where they occur in residential areas.
- The responsibility for pipelines conversion is subject to a mutual agreement for payment and construction with GMW, developers and relevant parties.

Sewer

- Goulburn Valley Water manages a limited number of existing sewer assets within the precinct.
- Existing properties are serviced by private septic systems, as the precinct is outside of the current sewer district boundary.
- Development in the precinct will likely trigger upsizing of existing sewer assets outside the precinct, in particular trunk sewer mains, sewer pump station updates and new sewer pump stations.
- The cost of trunk/distribution sewer infrastructure is attributable to Goulburn Valley Water, and the cost of reticulation mains will be attributable to the developer.

Electricity

- The Precinct is currently serviced with both high voltage and low voltage assets, both overhead and underground, and is supplied from the Shepparton Zone Substation.
- The existing 22kV electrical high voltage feeder servicing the Precinct will not have capacity to support the proposed redevelopment, and therefore a new overhead high voltage feeder will be required along main roads and interconnection roads.
- Powercor can accommodate local solar photovoltaic electricity generation, and would consider accommodating innovative electrical servicing strategies such as electric vehicles, microgrids and battery storage.

Gas

- There is currently no reticulation gas network within the Precinct.
- The adjacent gas network is likely capable of supplying the Precinct, and will likely require mains extensions from the networks on Poplar and Channel Roads.

- APA requires a staging plan to appropriately plan for gas delivery in the Precinct.

Telecommunications

- There are significant Telstra and Optus assets within the Doyles Road and Poplar Avenue Road reserves, including an Optus asset carrying internet from Melbourne to Sydney.
- The Precinct is fully covered within the NBN's fixed line footprint.
- Optus advised that the proposed redevelopment within the Precinct would require an upgrade to Optus's mobile services.
- NBN advised that to service the entire Precinct , a new fibre network would be required, which would it require appropriate Precinct planning to deliver infrastructure in an efficient and coordinated manner.

Recommendations have been responded to in the following manner:

- No servicing constraints that cannot be rectified via the standard processes at the time of development were identified by the assessment.

16 STAGING

VPA have prepared a staging plan for inclusion in the PSP to guide the orderly release of land for development in line with infrastructure delivery across the PSP. The s included in the PSP at Plan 13: Infrastructure and Development Staging. This plan in a PSP will represent preferred development staging as determined at the time of preparation in consideration of local and regional context and the infrastructure requirements of new developments.

Consideration for the DTP requested lot cap has also been factored into the staging with the Short-Term identification of land representing roughly 800 lots.

The main factors that influence the determination of staging are:

- Parcel size
- Degree of land fragmentation
- Size and type of developer
- Interest / readiness of developer – passive or active in the development process? Are they likely to fund initial infrastructure in order to get the ball rolling?
- Location of existing/active industry
- Access to existing infrastructure and utilities (as recorded in this Background Report).
- Financial analysis of the DCP

The order in which a precinct develops can play a critical role in the creation of a successful community. These early staging decisions can have a long legacy, and if not carefully managed can result in a range of accessibility, safety, economic, environmental and social problems that can take many years to resolve.

Recommendations have been responded to in the following manner:

- Section 4.9 of the PSP outlines a series of Requirements that must be met and Guidelines that should be considered in response to delivery of development in line with Plan 13: Infrastructure and Development Staging.

17 STRATEGIC PLANNING COSTS

Costs associated with preparation of the PSP and DCP can be included by a Planning Authority in the DCP Development Infrastructure Levy as Plan Preparation Costs.

In this instance VPA and Council are seeking to include incurred costs to prepare the plan which includes:

- Technical report costs
- Staff resources

Plan Preparation Costs are itemised in the DCP Appendix B.

18 BACKGROUND TECHNICAL STUDIES

Technical Studies referenced in the Background Report

- Shepparton South East Drainage Functional Design and Costing Report - Alluvium – July 2022
- Shepparton Mooroopna 1% AEP Flood Mapping Project - Water Technology – 2021
- Shepparton Mooroopna 1% AEP Flood Mapping Project – Shepparton South East Addendum Water Technology May 2022.
- Shepparton South East PSP – Updated Flood Impact Assessment BMT, July 2022
- Shepparton South East Growth Corridor Framework Plan - Working Paper 4 Cultural Heritage – Tardis 2009
- Heritage Addendum inc. Statements of significance - Council Heritage Advisor 2022
- *East of Shepparton Historical Heritage Study*, Heritage Concepts, 2023
- Transport Impact Assessment Report – Stantec, July 2023
- Transport Functional Design and Costing – Channel Rd/Doyles RD and Poplar Ave/Doyles Rd – One Mile Grid – 2023
- Transport Functional Designs – Local Intersections – Spiire, 2017
- Transport Functional Design Costings - Local Intersections – Cardno, 2019,2023
- Bushfire Development Assessment Report– Terramatrix – July 2023
- Aboriginal Cultural Heritage Due Diligence Report – Jo Bell Heritage Services – June 2019
- Flora and Fauna Report – Ecology Heritage Partners – February 2022
- Desktop Land Capability Assessment – SMEC – May 2022
- Amenity Impact Assessment – GHD – January 2022
- Noise Impact Assessment – GHD – April 2022
- South Shepparton Community Infrastructure Needs Assessment – ASR Research – November 2022
- Activity Centres Review – Ethos Urban – April 2022
- Utility Servicing Assessment – GHD – April 2022
- Community Infrastructure Design and Costing – Cohen Leigh, June 2022
- Shepparton Alternative Route Intersections Functional Designs and Costings – One Mile Grid – February 2023
- Open Space and Recreation Report – Hansen – March 2023
- Sports Reserve Opinion of Probable Costs – Hansen – April 2023
- Shepparton East Agricultural Land Assessment, RMCG, 2020

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Background Report

February 2024

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