East of Aberline Precinct Structure Plan

Key Issues Paper

February 2019

WARRNAMBOOL
CITY COUNCIL

Victorian Planning Authority

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1 BACKGROUND

1.1 Purpose of this Report

The objectives of this report are:

- To identify significant features within the East of Aberline Precinct Structure Plan (PSP) area and present the key opportunities and constraints for development
- To place the PSP within a wider context including its relationship to the adjoining residential areas, the North East Industrial Growth Precinct and the Eastern Activity Centre
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- To identify key elements and points of difference to surrounding areas that will inform the precinct's l sense of place, community focus and structure.

1.2 Presentation of this Report

This report provides 'desktop audit' which establishes the framework and informs the planning of the East of Aberline PSP. The discussion and analysis also considers the growth in broader Warrnambool and the need to plan in a coordinated integrated manner.

Background documents informing this report include the Regional Growth Plans and the Long-Term Growth Area background report.

A brief outline of the sections of the report is provided below.

- Section 2 provides the strategic context for the PSP
- Section 3 provides an overview of the site investigations that have been undertaken to date and the implications for the PSP
- Section 4 provides a demographic forecast in order to determine the role of the PSP in the context of the potential future population of the growth area
- Section 5 provides an analysis of general infrastructure and service provision, the capacity and ability to provide for additional population created by the PSP and the broader growth area context
- Section 6 provides and overview of the vision and principles of the PSP.

2 STRATEGIC CONTEXT

2.1 Regional context

Warrnambool City is Victoria's largest coastal regional city outside of Port Phillip Bay, and is the fastest growing economy and population centre in south-west Victoria. (https://www.warrnambool.vic.gov.au/about-warrnambool, 2018)

The city abuts the Southern Ocean to its southern border and is bound by Moyne Shore to the north, east and west. The city is located approximately 260 kilometres west of Melbourne. The context Plan is shown as Figure 1.

2.2 Long term growth area considerations

The PSP area is one of six identified growth areas to be developed for residential purposes with Warrnambool. The PSP is well located adjacent to other key development sites identified in the Warrnambool Planning Scheme, being the Eastern Activity Precinct and the Horne Road Industrial Precinct.

2.3 Policy context

Background documents and policy informing this report include:

- The State and Local Planning Policy Framework set out in the Warrnambool Planning Scheme
- Plan Melbourne, Metropolitan Planning Strategy (Victorian Government, 2017)
- Great South Coast Regional Growth Plan (2014)
- Warrnambool City Council Long Term Growth Area Background Report, March 2016
- Warrnambool Council Plan 2017-2021
- Warrnambool Land Use Strategy 2004
- Warrnambool City-Wide Housing Strategy 2013
- Green Warrnambool 2018.

2.4 Planning controls

2.4.1 Planning Zones

Land within the PSP area is currently predominantly zoned Farming Zone. The Wannon Water storage ponds located in the south-east corner of the PSP are zoned Public Use Zone (PUZ1).

Land immediately west and south-west of the PSP is zoned General Residential Zone. Land within Horne Road Industrial Precinct is zoned Industrial 3 Zone (INZ3). Key roads framing and within the PSP area (Aberline Road, Wangoom Road and Horne Road) are zoned Road Zone (RDZ2).

Land to the immediate north of the PSP is located within the Moyne Planning Scheme and is zoned Farming Zone.

2.4.2 Overlay controls

The only overlay that affects the PSP area is the Bushfire Management Overlay (BMO) which was introduced to the land as part of (VC140 12/12/2017). The management of bushfire will be addressed and the necessity of this overlay within an urban context will be considered through the planning scheme amendment for the PSP.

Development of the land surrounding the PSP area has largely been planned using Development Plan Overlays (DPO1, DPO7 and DPO11).

Figure 1 - Regional Context

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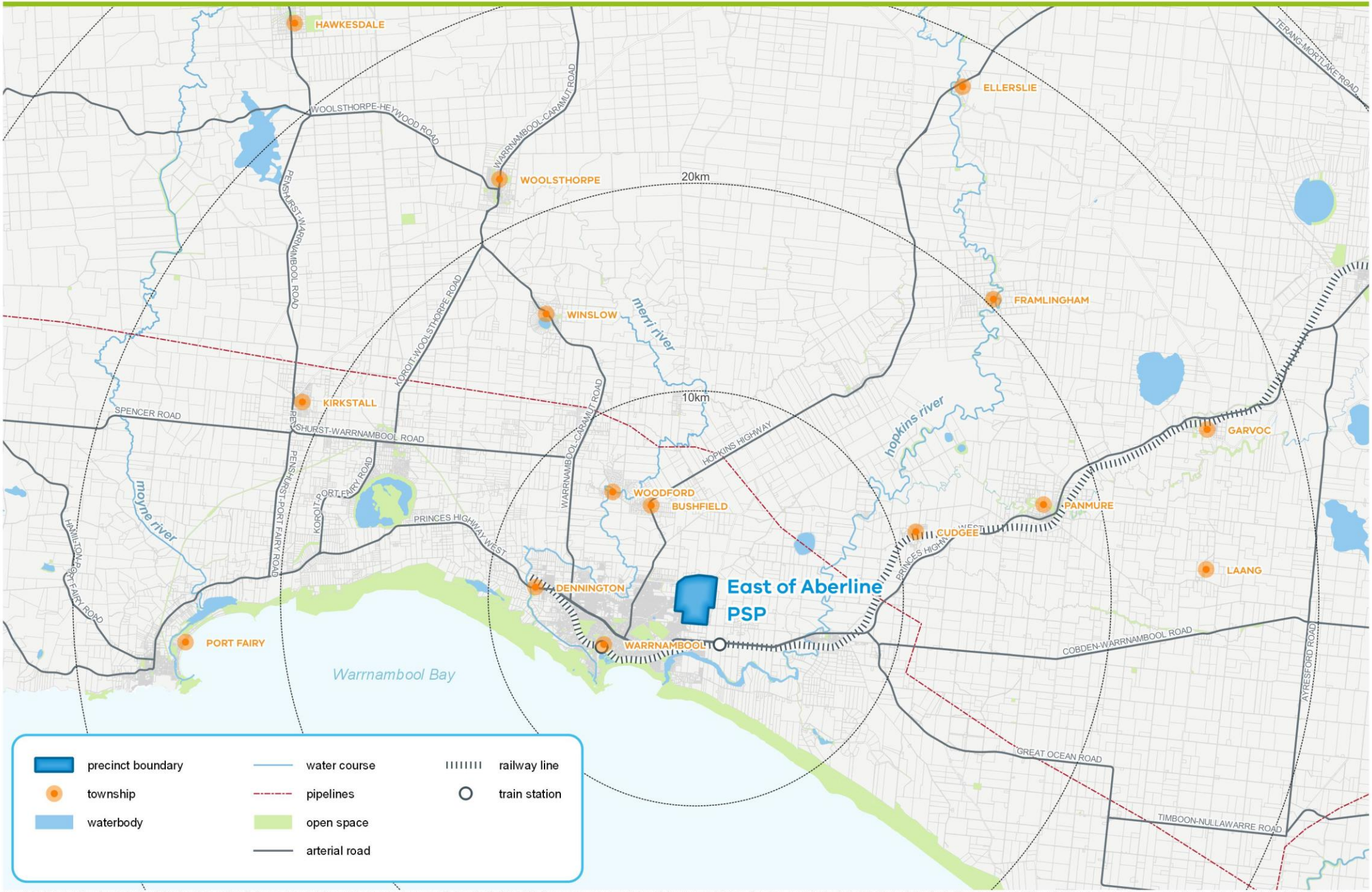


2.5 Demographics

2.5.1 Existing Community

Demographic forecasts provide guidance on expected population numbers and community profiles and are used to form the basis for infrastructure provision and catchment planning. Demographic forecasts are considered generally at the broader corridor level and further tested more specifically at the precinct level.

According to the Australian Bureau of Statistics (ABS), the estimated resident population of Warrnambool, including Dennington (state suburb geographic areas) was 34,571 people as of June 2017.

The population of Warrnambool North East, an area bound by the locality of Woodford, Wangoom Road and Dixons Lane in the north, Staffords Road in the east, the Princes Highway, Horne Road, Dales Road and Moore Street in the south, and Mortlake Road and the Hopkins Highway in the west, was 4,212 (Forecast .id, 2018).

2.5.2 Future Community

By 2036, it is projected that the population of Warrnambool is expected to be approximately 46,210 people (Forecast .id, 2018), a projected increase of 11,639 people, or 34%.

East of Aberline is projected to grow by 2,615 people (60%) to 7,027 by 2036 (Forecast .id, 2018).

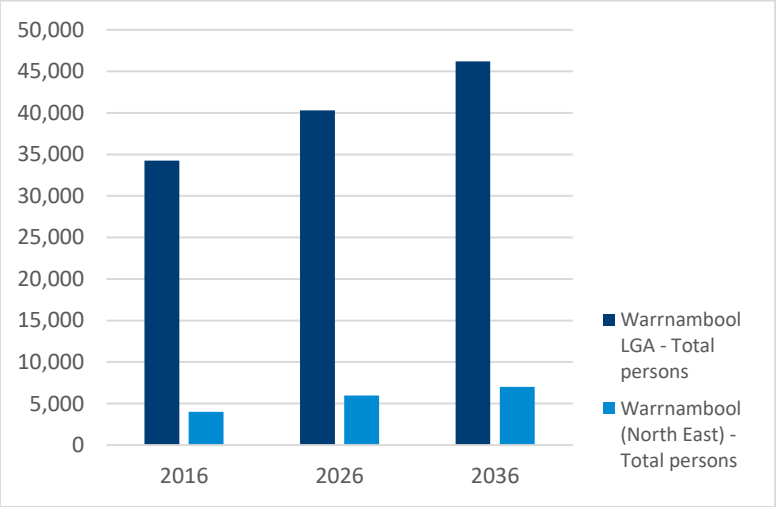
The forecast population growth in Warrnambool and Warrnambool North East from 2016- 2036 is shown in Figure 2.

2.5.3 Implications for the PSP

The PSP will plan for the above-identified demographic forecasts by:

- Planning for housing diversity by guiding a range of residential densities and encouraging a range of housing types.
- Providing community infrastructure in accordance with standard provision ratios and in consideration of facilities available in the surrounding areas (see Section 4.1 for further discussion).

Figure 2 – Forecast Population Growth in Warrnambool 2016-2036



(Source: Forecast.id)

Figure 3 - Local Context

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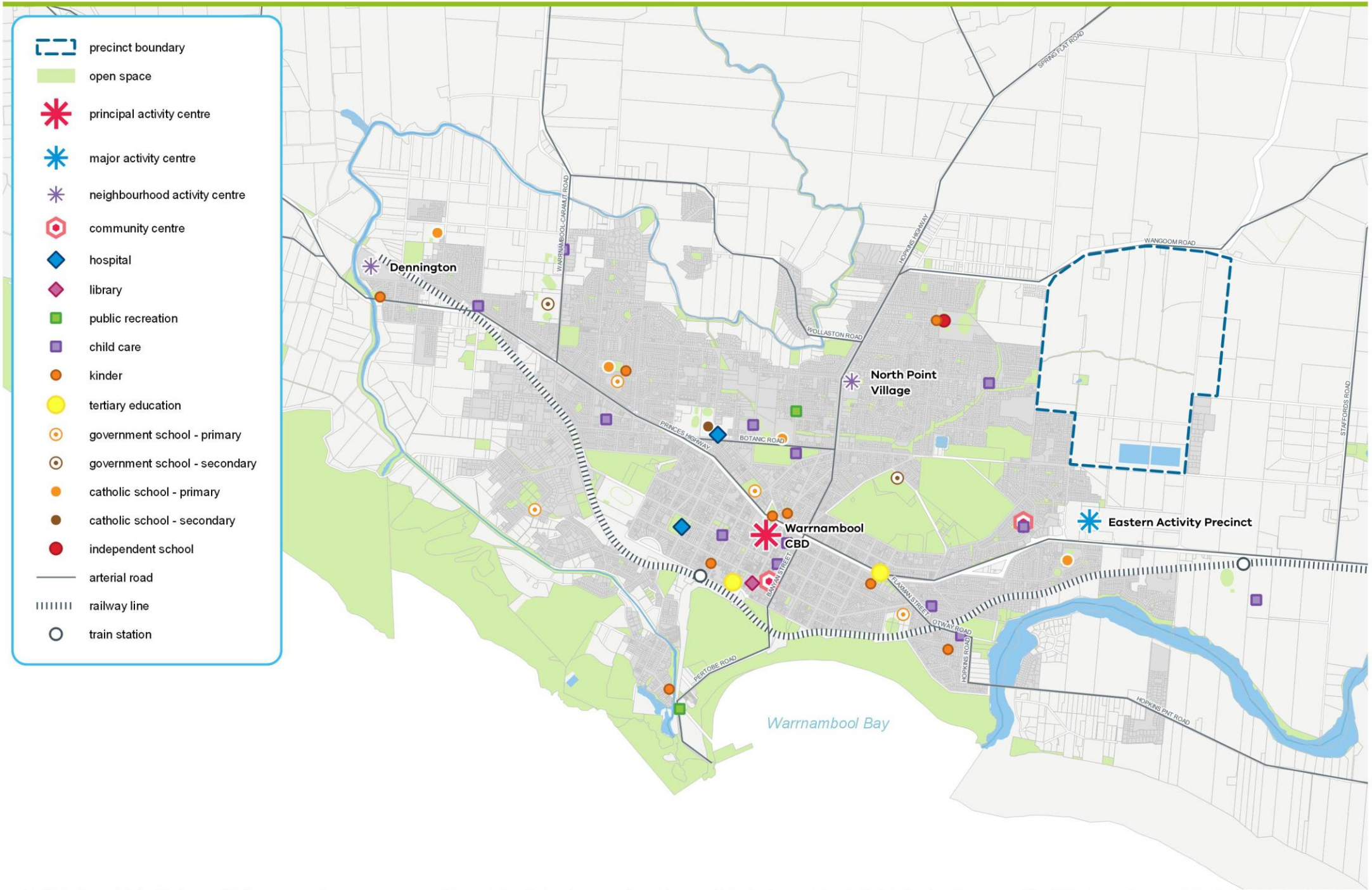


3 PHYSICAL CONTEXT

3.1 Site Features

The PSP area covers approximately 360 hectares of land and is located between Wangoom Road to the north, Dales Road to the south, Aberline Road to the west, and Horne Road to the east.

The northern boundary of the growth corridor abuts the municipal boundary of Moyne Shire. The corridor is positioned centrally to other key development sites identified in the Warrnambool Planning Scheme, being the Eastern Activity Precinct and the Horne Road Industrial Precinct.

It is situated approximately 4km to the east of the centre of Warrnambool and is bordered by residential, farming and industrial land, as shown in Figure 3.

The land has been identified as a "future corridor extension" in the Great South Coast Regional Growth Plan (2014) and The Warrnambool City-Wide Housing Strategy (2013). The area consists of 25 parcels of land ranging from 4000m2 to 50 hectares in area.

The Tozer Memorial Reserve is located central to the PSP area and is owned by the Minister for Education.

The land within the PSP area has a gentle undulating topography. There is fall towards Russells Creek that traverses the precinct. The land also has a 1:60 fall to the north towards Wangoom Road. There is a minimal east-west cross-fall.

3.1.1 Vegetation

Due to the agricultural history of the land, the precinct has largely been cleared of native vegetation. The precinct does not contain any formal conservation reserves however a key landscape feature of the precinct is the Tozer Memorial Reserve located centrally within the precinct. This 20-hectare property was donated to the Victorian School Plantation Endowment Scheme in 1926 and is currently managed by a trust committee represented by three local schools. The site retains large tracts (approximately 8 hectares) of the Grassy Woodland Ecological Vegetation Class (EVC) and is recognised as a significant ecological resource within the context of the surrounding landscape.

Introduced vegetation in the PSP area consists of grazed pasture and non-native plantings in windrows around dwellings, sheds, and the adjoining roadsides. Non-native plantings are present across the study area, with commonly occurring species including Monteray Cypress *Cupressus macrocarpa* and Radiata Pine *Pinus radiata*. Non-Victorian native species commonly present included Sugar Gum *Eucalyptus cladocalyx*, Tuart *Eucalyptus gomphocephala*, Yate *Eucalyptus cornuta* and Southern Mahogany *Eucalyptus botryoides.*

3.1.2 Watercourse

Russells Creek traverses the precinct, meeting the Merri River approximately 3.5 kilometres west of the site. Scattered ephemeral farm dams are also present across the PSP area and the south-east section of the site supports two large water storage ponds managed by Wannon Water.

3.1.3 Response/ Implications for PSP

As part of an integrated approach, the PSP should take advantage of its natural features including remnant vegetation along fence lines and dams. The Tozer Memorial Reserve is a key landscape feature and provides the opportunity for passive recreation, revegetation and education opportunities whilst also being a key view line within the precinct.

3.2 Biodiversity

Vegetation mapping completed as part of this assessment largely confirmed the modelled paucity of native vegetation within the study area. Surveys completed across 271 hectares (72%) of the PSP area recorded approximately eight hectares of Plains Grassy Woodland (EVC 55_63), the majority of which comprised natural regrowth within the northern half of Tozer Memorial Reserve.

Approximately 1.2 hectares of EVC 55_63 within the northern half of the reserve is considered likely to be remnant, as this area was excluded from historical plantation activities.

The remaining assessed portions of the PSP area were identified as being either developed or supporting non-remnant vegetation (i.e. planted and/or direct seeded indigenous and non-indigenous species, grassland/ pasture dominated by introduced species or crops).

Introduced vegetation in the PSP area consists of grazed pasture and non-native plantings in windrows around dwellings, sheds, and the adjoining roadsides.

Non-native plantings are present across the study area, with commonly occurring species including Monteray Cypress Cupressus macrocarpa and Radiata Pine Pinus radiata. Non-Victorian native species commonly present included Sugar Gum Eucalyptus cladocalyx, Tuart Eucalyptus gomphocephala, Yate Eucalyptus cornuta and Southern Mahogany Eucalyptus botryoides.

Detailed fauna surveys completed within the northern half of Tozer Memorial Reserve between 2013 and 2014 (Landtech Consulting 2014b) recorded a range of native and introduced species including Bush Rat *Rattus fuscipes*, Koala, Eastern Grey Kangaroo *Macropus giganteus*, Swamp Wallaby *Wallabia bicolor*, Brushtail Possum *Trichosurus vulpecula*, Short-beaked Echidna *Tachyglossus aculeatus*, Gould's Wattled Bat *Chalinolobus gouldii*, Blotched Blue-tongue Lizard *Tiliqua nigrolutea*, Copperhead Snake *Austrelaps superbus*, Striped Marsh Frog *Limnodynastes peronii*, Southern Brown Tree Frog *Litoria ewingii* and Common Froglet *Crinia signifera*.

The surveys also recorded a number of conservation-listed fauna species. Information supplied by Council indicates that recent remote camera footage from Tozer Memorial Reserve contained a potential record of Agile Antechinus *agilis*. Although this species is not conservation listed, if confirmed present within the reserve, this will represent the only documented record within the Warrnambool region.

The Victorian Biodiversity Atlas (VBA) contains previous records of 20 nationally significant, 34 State significant and 17 regionally significant fauna species within 10 kilometres of the study area.

The precinct provides a suitable habitat for species of national (Grey-headed Flying-fox and Southern Bent-wing Bat), State (Hardhead, Blue-billed Duck, Eastern Great Egret and Grey Goshawk) and Regional (Royal Spoonbill, Spotted Harrier and Latham's Snipe) conservation significance.

The ecological features of the PSP area are shown in Figure 4.

3.2.1 Response/ Implications for PSP

The Environmental Protection and Biodiversity Conservation (EPBC) Act (1999) establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on matters of National Environmental Significance (NES), or those that are undertaken on Commonwealth Land.

An action, unless otherwise exempt, requires approval from the Commonwealth Minister for the Environment if it is likely to have an impact on any of the following matters of NES: World Heritage properties, National Heritage places, Ramsar wetlands of international significance, nationally listed threatened species and ecological communities, migratory species protected under international agreements, Commonwealth marine areas, the Great Barrier Reef Marine Park, nuclear actions and water resources (for coal seam gas and large coal mining projects).

Tozer Memorial Reserve is known to support the EPBC Act listed Grassy Eucalypt Woodland of the Victorian Volcanic Plain ecological community and Growling Grass Frog. The Grey-headed Flying-fox and Southern Bent-wing Bat are also likely to use foraging resources within the PSP area on occasion.

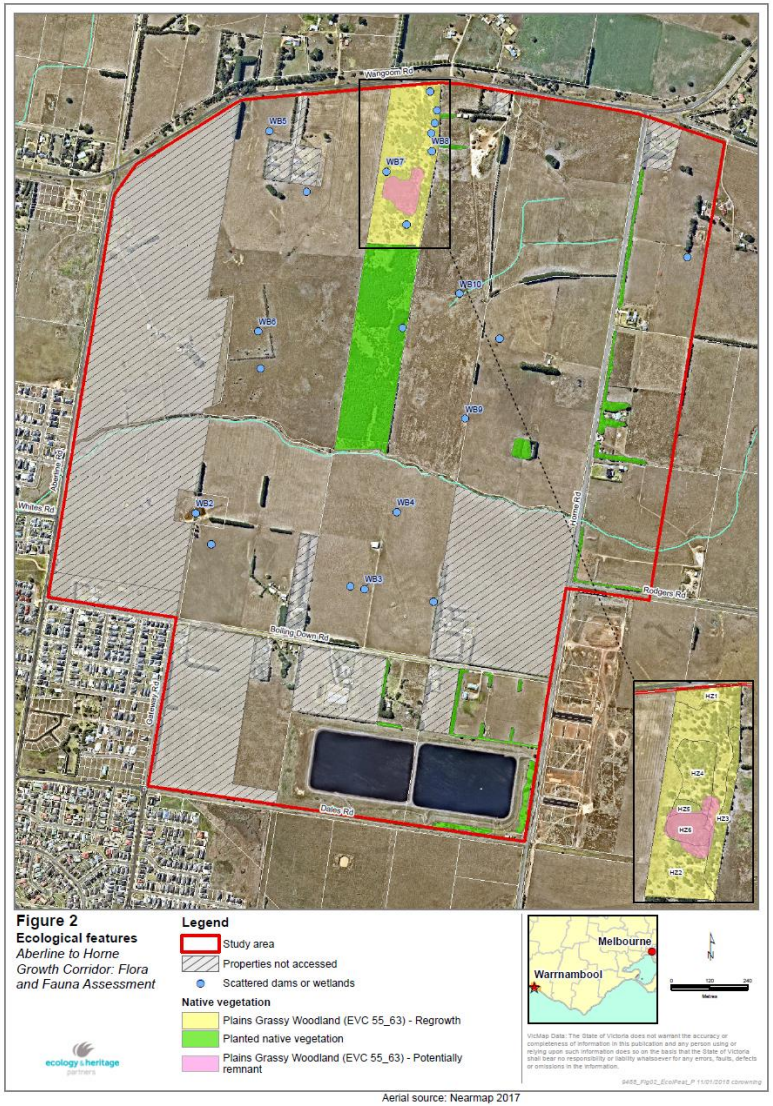
Given that the reserve is likely to be retained for conservation, the supported values are unlikely to be impacted by future development, subject to appropriate buffers being identified to support and protect habitat corridors. Although waterbodies outside the reserve, including Russells Creek and scattered farm dams, represent low quality habitat for Growling Grass Frog, there is potential for this species to inhabit or disperse between these features. A targeted survey for Growling Grass Frog is currently underway and the report findings are imminent. This work will inform the PSP and potential buffers required for habitat corridors. This should be reflected as an implication for the PSP.

Future development within the PSP area is unlikely to significantly impact Grey-headed Flying-fox or Southern Bent-wing Bat given the highly dispersive nature of the species and availability of similar and higher quality foraging habitat in the locality.

Following the completion of a targeted Growling Grass Frog survey, the significant impact test should be applied to determine the requirement for an EPBC Act referral.

Any action that is likely to have a significant impact on State matters, as defined under the relevant guidelines, would need to be referred under the Environment Effects Act 1978. Actions undertaken in accordance with a prescribed Precinct Structure Plan (PSP) are exempt from the requirements of the EE Act.

Figure 4 – Ecological Features



Aerial source: Nearmap 2017

3.3 Bushfire

A Bushfire Assessment Report has been undertaken to assesses the hazard and identify the bushfire protection measures that will be required for future development of the PSP area. The study concluded that development can appropriately prioritise the protection of human life and meet the objectives of Clause 13.02 of the Warrnambool Planning Scheme by ensuring future dwellings and other development will not be exposed to Radiant Heat Flux (RHF) above 12.5kW/m^2, commensurate with a Bushfire Attack Level 12.5 (BAL-12.5) construction standard.

3.3.1 Existing Conditions

The PSP area is currently a designated Bushfire Prone Area (BPA). Land within approximately 150m of the Woodland in Tozer Reserve that extends southwards from Wangoom Road into the growth corridor is also covered by the Bushfire Management Overlay (BMO). This area comprises approximately 7.7% of the proposed residential area within the growth corridor. Russells Creek is currently degraded within the growth area and will be protected within a linear reserve and re-vegetated. For the purpose of the bushfire assessment it was assumed that vegetation in the Russells Creek reserve will be classified Woodland or Grassland. The associated wetlands could feasibly also contain Scrub.

The PSP area is in a low bushfire risk landscape. In the directions from which a bushfire threat typically arises (north, northwest, west or southwest) the landscape is generally pastoral or comprises the urban area of the existing township. The topography on and around the growth area is benign, with no significant changes in elevation or slopes that would significantly exacerbate the bushfire attack.

There are low risk urban-residential and township areas immediately adjacent to the growth area that are not in the BPA and which offer a place of shelter from any bushfire that may occur.

Figure 5 – BMO coverage and potential BMO1 areas

3.3.2 Response/ Implications for PSP

There are no significant obstacles to future development in the PSP area complying with the applicable strategies in Clause 13.02 and the building regulations invoked in a BPA.

Large areas of the growth area are available for BAL-12.5 development. To achieve this rating, required for settlement growth by Clause 13.02, buildings will need to be setback 19m or 22m from classified Grassland and 33m or 41m from classified Woodland, depending upon the effective slope. These areas are shown on Figure 5.

Future development within 150m of Tozer Reserve will be covered by the BMO, which will require appropriate bushfire protection measures to be implemented addressing subdivision, landscape, siting and design, defendable space, construction, water supply and access as prescribed by Clause 53.02 of the Warrnambool Planning Scheme.

Development close to the perimeter of the PSP area will need to respond to classified vegetation beyond the growth corridor boundary, including providing the requisite setbacks to achieve BAL-12.5.

Roads

Existing perimeter roads should be incorporated into the low threat setbacks required for future dwellings. The existing road formations and, in some cases managed nature strips, could provide most or all of the required 19m or 22m setback required from Grassland (depending on slope).

Within the PSP, perimeter roads around significant areas of retained vegetation should be incorporated into subdivision design where possible, to achieve the required separation distances for future development from any potentially hazardous vegetation, and to facilitate property protection and firefighting. Interface roads around Tozer and Russells Creek reserves, as shown in the landscape strategy (Spiire, 2018) are supported. Good access and egress for emergency management vehicles and residents, in the event of a bushfire, can be achieved via a conventional residential road network.

Vegetation

Urban development of the growth area will result in the removal of most classified Grassland from within the growth corridor boundary. Woodland in Francis Tozer Reserve is to be retained and a number of reserves are likely to be created along Russells Creek, which may involve re-vegetation at some locations.

Part of the area covered by the BMO may be suitable for application of Schedule 1 to the BMO in the Warrnambool Planning Scheme, provided appropriate setbacks from Francis Tozer Reserve are provided in subdivision design.

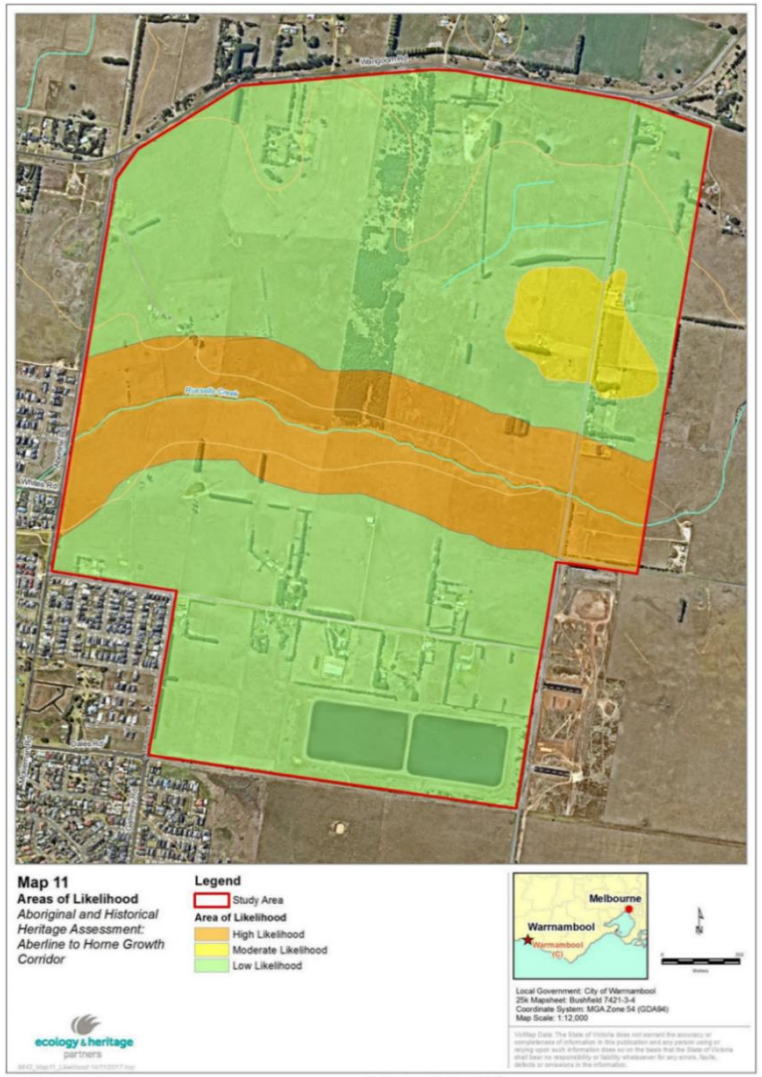
Much of the growth area is likely to be rendered low threat by the planned urban development and may become eligible for excision from the BPA as development proceeds.

3.4 Heritage

The PSP area is bisected by an identified area of cultural heritage sensitivity, being the land within 200m of Russells Creek (under the *Aboriginal Heritage Regulations 2007*). Should future developments be regarded as high impact activity by the *Aboriginal Heritage Regulations*, such as multi-lot subdivision and residential development, a Cultural Heritage Management Plan (CHMP) will be required in particular areas of the subject site.

The areas of heritage likelihood are shown in Figure 6.

Figure 6 – Areas of Heritage Likelihood



3.4.1 Response/ Implications for PSP

Recognition of potential Aboriginal Heritage along Russells Creek will be significant as well as further investigation into the post-settlement heritage features to provide historical context to the precinct to the broader area. The retention and enhancement of these features will preserve historical links and strengthen the sense of place and identity for the future community.

3.5 Views

Despite the generally low-lying topography of the precinct, there is an opportunity to maximise on views to and from Tozer Reserve as the key landscape feature of the precinct, as shown in Figure 7

Wangoom Road rests on a natural ridgeline and the land falls away steadily to the south, permitting good long views across the Growth Corridor, including the slopes on the opposite side of Russells Creek and beyond.

From the southern perimeter of Tozer Reserve there are good medium views upstream along the Russells Creek until they are interrupted by

the Horne Road crossing. Views downstream are obscured by vegetation but are likely to also be good medium views up until the intersection with Aberline Road.

3.5.1 Implications for the PSP

Linear and open space areas will be provided to enhance views and connections to destinations within the precinct such as Russells Creek and Tozer Reserve.

Avoiding vehicular crossings of the creek between Aberline and Horne Road will help maintain views.

Figure 7 - Elevation & Key Views

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3.6 Hydrology, Contamination and Geotechnical

3.6.1 Flooding and Water Quality

The PSP area is within the Merri River Catchment. The primary waterway in the PSP area is Russells Creek which is a tributary of the Merri River and a drainage corridor. Smaller 'local catchments' are evident, as shown in Figure 8.

Engeny have prepared a preliminary report (dated September 2017) to assess the stormwater and flood management. Flood modelling was undertaken as part of a previous flood study for Russells Creek.

The Glenelg Hopkins Catchment Management Authority (GHCMA) have requested a 30m buffer from the top of banks on each side of the Russells Creek which is consistent with both the Victorian Waterway Management Strategy and Clause 14.02.1 Catchment Planning and Management of the state planning policy. This will allow for the waterway to be protected and a riparian zone conserved and further established adjacent to the waterway. A corridor of this width will also be able to convey the 1 % AEP flood in a safe manner.

The GHCMA also require active edges along the waterway corridor. This should take the form of a road, with houses then fronting onto the waterway corridor from the far side of the road. No houses or private property should back onto the waterway. Having an active edge alongside the waterway corridor encourages passive surveillance of the waterway, reducing the likelihood of illegal dumping of rubbish and improving the safety of the area. The road corridor would be separate to the waterway corridor (i.e. offset 30m from the top of bank). It is proposed that the cycling/walking trail will be outside the 30m buffer riparian zone and separate from the road corridor.

Figure 8 – 1 % AEP flood extent

The GHCMA have indicated that the waterway corridor should be vegetated with native vegetation. The wetlands and sedimentation basins proposed for stormwater treatment could be located within the waterway corridor, however they must be offline assets (i.e. creek flows do not enter the treatment systems) and should be placed high enough above the top of bank so that they are not flooded in frequent events from the creek. GHCMA will need to be consulted on the exact flood event and level which is to apply but as a minimum, treatment devices should be above the 10% AEP event flood level and above the 1% AEP flood level if practical.

Structure planning will need to ensure that stormwater run-off is appropriately managed to improve the health of waterways. Key opportunities to providing innovative water cycle management solutions are listed below:

- Centralising stormwater treatment infrastructure in the form of wetlands will create community assets which enhance liveability, reduce the maintenance burden for Council and also create habitat for wildlife. The wetlands will also help to reduce the impact of development on the waterway
- Along Russells Creek the 1% AEP flood extent is relatively well contained. This is due to the topography of the area, with the creek lying in a well-defined gully. There is some flooding between Boiling Down Road and Dales Road, in particular near Aberline Road. This occurs as the area is very flat and there is only limited capacity for water to flow out of this area. The 1% AEP flood extent for the PSP site is shown in Figure 8.

A waterway corridor should be established to protect and enhance the Russells Creek Waterway corridor. The GHCMA and the relevant planning legislation support a 30m setback from each side of the top of bank of the waterway. This corridor will ensure that the 1% AEP flood is able to be conveyed safely through the development and could also include shared use paths and wetlands (provided they are offline from the creek and above a suitable flood level)

3.6.2 Contamination

No contamination study has been undertaken to date. Further work is required to determine the extent of existing contamination and the impact of possible contamination on the future urban structure.

3.6.3 Implications for the PSP/ Issues to be resolved

The PSP should provide that encumbered land be set-aside as a municipal drainage reserve and passive recreation purposes.

Development of the PSP area will need to be undertaken in a way which protects houses from flooding. The simplest way to achieve this is to “box out” roads so that dwellings sit above road levels and the road network can convey any overland flow safely to the retarding basins and outfall points without flooding any dwellings. The retarding basin as wetland 4 will also need to be large enough to ensure that the peak outflow is not increased above the capacity of the existing downstream pipe. The storage lost by developing this land will need to be offset within the retarding basin.

Greater work is required to determine the extent of flooding and overland flows. Stormwater will need to be appropriately managed to reduce run-off into Russells Creek. This will inform the preparation of a more detailed drainage and integrated water management strategy.

Investigations to confirm the likelihood of land contamination and groundwater conditions will be required to inform the planning scheme amendment.

4 INFRASTRUCTURE AND SERVICES

The PSP guides the designation of land uses and identifies anticipated future development outcomes and associated infrastructure needs. These include:

- Community facilities, such as schools and community hubs which are planned with standard provision ratios and review of existing catchments
- Retail land allocation which is guided by standard provision ratios and review of existing supply
- Open space provision which is guided by standard provision ratios
- Traffic network which is guided by strategic transport modelling for the wider area for the major roads as well as PSP standards
- Drainage and stormwater management for which a new strategy was prepared as part of the PSP process
- Services and utilities which is informed by a servicing report and informed by the service providers.

4.1 Primary Schools

4.1.1 Existing Provision

There are four government primary schools in Warrnambool and two country primary schools in the Warrnambool municipality that enrol children from within the Warrnambool area. They are:

- Merrivale Primary School
- Warrnambool East Primary School
- Warrnambool Primary School
- Warrnambool West Primary School
- Woodford Primary School
- Allansford Primary School.

There is also one possible future government school proposed for Warrnambool in the North of the Merri precinct.

There are also five non-government primary schools in Warrnambool:

4.1.2 Response / Implications for PSP

The Department of Education and Training will advise on the need for a government primary school in the PSP area.

Generally, P-6 schools are located, where practical, to optimise equitable distribution of and access to facilities as well as walkable catchments. Schools should generally be located on collector roads with or proximate to other community facilities and town centres.

Given this PSP is estimated to deliver approximately 4000 additional dwellings, and the geographical distribution of government primary schools in Warrnambool (as shown in Figure 3) shows that there are no government primary schools in the northeast suburbs of Warrnambool, it is anticipated that a government primary school may be required to be identified in the future urban structure.

This proposed school would serve the future community within the PSP area, as well as the existing surrounding community.

4.2 Secondary Schools

4.2.1 Existing Provision

There are two government secondary schools in Warrnambool – Brauer College and Warrnambool College. There are also two non-government secondary schools in Warrnambool.

There are no secondary schools in surrounding rural areas and townships, so these secondary schools receive students from areas surrounding Warrnambool. A larger catchment analysis by the

Department of Education and Training (DET) may be required to determine the secondary school provision requirements of the greater surrounding area.

4.2.2 Response / Implications for PSP

The Department of Education and Training will advise on the need for a government secondary school in the PSP area

As this PSP is estimated to deliver approximately 4000 dwellings, it is not anticipated that a government secondary school will be required to be identified in the future urban structure.

4.3 Independent Schools

4.3.1 Standard Provision

There are no standards of provision covering independent schools. However, the Catholic Education Office base their provision on Catholic Parish participation and demographics. These standards equate to:

- One Catholic Independent School for a population of 64,400 (approximately 23,000 dwellings)
- P-6 site area of 3.5 hectares.

Similarly, the Catholic Education Office provision for secondary schools equate to:

- One Catholic Independent Secondary School for a population of 102,200 (approximately 36,500 dwellings)
- P-12 site area of 8 hectares.

4.3.2 Existing Provision

Warrnambool currently has one Catholic secondary school - Emmanuel College (37 Ardlie St), one P-12 Christian College - King's College (44 Balmoral Rd), and the following four Catholic primary schools:

- Saint Pius X Primary School (32 Hoddle St)
- St. Joseph's Primary School (70 Botanic Rd)
- Our Lady Help of Christians Primary School (28 Selby Rd)
- St John's Primary School (Russell Street).

4.3.3 Response/ Implications for PSP

It is not envisaged that there will be need for further independent schools within the PSP however interest in the provision of independent schools can change at any time.

4.4 Retail

4.4.1 Existing situation

The Warrnambool Municipal Strategy Statement (MSS) identifies a retail hierarchy within the City, where the City Centre is the principal retail centre, the Eastern Activity Precinct (EAP) is a major (secondary) retail centre and a number of neighbourhood and local centres are also identified to provide for the day-to-day needs of communities.

Principal Activity Centre: Warrnambool City Centre

The primacy of the City Centre is reinforced by its designation as the principal activity centre for Warrnambool and southwest Victoria. The City Centre's regional role includes its function as the primary retail centre, principal location for higher-order business and professional services and as the location for a diversity of other complementary regional and city-wide functions.

The City Centre is the focus for a range of other regional services and facilities including medical and health services, education providers, community services, commercial and business services, hospitality, entertainment and tourism activities.

Major Activity Centre: Eastern Activity Precinct

The Eastern Activity Precinct (EAP) is Warrnambool's only major activity centre, second only in scale and importance to the City Centre. In addition to its importance as an activity centre, the precinct, and adjoining land to the east, also serves a role as the City's current eastern gateway.

The EAP comprises several key developments that are unified by the Princes Highway (Raglan Parade). The Precinct contains several sub-precincts: a regional bulky goods cluster, the Flying Horse Inn mixed use development, and Gateway Plaza and other retail, which is the secondary retail centre in the City, providing a range of weekly and discretionary goods to east Warrnambool and surrounding districts. New investment is encouraged in the EAP to deliver an expanded range of complementary roles and services that reinforce its role as a major activity centre but in a manner that supports the City Centre.

The EAP is also identified as being the principal bulky goods precinct within the Municipality, with a regionally-significant cluster of restricted retail stores.

Neighbourhood activity centre - Northpoint Village

Northpoint Village is an existing neighbourhood centre in North Warrnambool and provides an important community function for the growing north Warrnambool community.

NorthPoint Village includes a medium sized supermarket and associated specialty shops, with a total retail-commercial floorspace of approx. 5,565m² Gross Leasable Area (GLA). The centre offers some medical services and a mix of retail. The provision of a general medical practice diversifies the centre to ensure it offers a broader non-retail role, enabling the centre to operate as a 'community hub' for north Warrnambool.

Neighbourhood activity centre - Dennington

Dennington Neighbourhood Activity Centre is a small village precinct and the primary focus for the local convenience and weekly shopping needs of Dennington / West Warrnambool, comprising a range of retail, commercial, leisure and community facilities and enticing outdoor spaces. Improved links between the Town Centre and residential growth areas, in association with new mixed-use development along Lindsay Street will ensure harmonious integration between the new retail area and the existing traditional village heart.

Dennington is the western gateway to Warrnambool and serves an important role as the first front of urban development when approaching the City from the west.

4.4.2 Response / Implications for PSP

Warrnambool's City Centre has historically been the focus of all major retail activity and investment with the Eastern Activity Precinct, as a secondary activity centre providing for a range of day-to-day and weekly needs closer to the growing northern and eastern areas of the City and encouraging shorter trips for people to meet their basic requirements.

The EAP and NorthPoint Village, will continue to provide day-to-day shopping needs of a convenience nature to existing and new development in the North East Warrnambool area.

A 'residential' scale convenience centre could be supported for the precinct, as per the existing retail policy. If further retail facilities are proposed beyond a residential scale convenience centre, a retail analysis will be required to be undertaken by the developer to support any future proposal. However, given the proximity to the EAP, it is unlikely that significant retail would be supported.

4.5 Open space

4.5.1 Standard of Provision

As per the Precinct Structure Planning Guidelines, the overall percentage of credited open space provision PSPs is 10% of Net Developable Area (NDA) which is generally applied as 6% for local sports fields and 4% as local parks.

However, this percentage breakdown can vary depending on Council's position on delivery of these facilities, the anticipated needs of the community as well as the existing physical and landscape characteristics of the area.

Local Sports fields are planned to be co-located with schools and local Council community services in order to create a vibrant community hub for the precinct with the usual starting point being an 8-9ha facility that can accommodate a range of activities generally including football/cricket/netball and associated playgrounds and car parking.

Local parks are generally located to ensure an equitable distribution of accessible green space throughout the community with the size and configuration determined at a neighbourhood by neighbourhood level. It should be noted that the sports fields also provide for the informal recreation of local residents.

The Warrnambool Open Space Strategy aims for a high quality, diverse, accessible open space network that reflects community needs and enhances social connection, environmental protection and economic benefit. This vision is applicable at both the municipal and precinct level.

The Russells Creek corridor is identified by the Warrnambool Open Space Strategy as a key area to improve connectivity and provide a connected walking/cycling trail. The section of the creek through the PSP area is identified as future open space in the Strategy.

The overall aim is to deliver an appropriate amount of well distributed, diverse and accessible open space across the precinct – creating an integrated network, with a walkable catchment to local parks of no greater than 400m.

4.5.2 Existing situation

Northeast Warrnambool currently contains 2.3% of its total area as open space. This is quite low compared to other precincts in Warrnambool and when benchmarked against other municipalities. Key features of the precinct include Brierly Recreation Reserve, which is a 12ha regional-level sports reserve, the Russells Creek Walking Trail, and Tozer Memorial Reserve.

There are two neighbourhood-level parks adjoining the Russells Creek Trail, one at the corner of Whites and Aberline Roads, and one in the Maraki estate off Wangoom Road. There are two additional local open spaces in the precinct. There is no existing open space within 400m of the corner of Aberline and Wangoom Roads. Whilst Tozer Reserve provides value for bushwalking, it is currently classified as 'restricted open space' due to its environmental values and land tenure.

At present, only a thin corridor of Russells Creek is reserved as crown land within the PSP area. There is an additional 2ha area of crown land within the precinct, but it isn't currently used for open space purposes and is encumbered by a farm dam. Brierly Reserve provides important active open space to northeast Warrnambool. It is in the process of being upgraded as a multi-use regional sporting reserve. A small section of the southwestern part of the PSP precinct is within a 1km walking catchment of the reserve.

4.5.3 Response/ implications for PSP

The projected population increase as a result of the precinct would bring the per capita open space provision to the second lowest in Warrnambool without the addition of further open space (3.8ha/1000 residents of recreational open space).

The current distribution of open space does not provide local parks within a 400m walk within the precinct, nor a sports reserve and walking trail within 1km of all parts of the precinct. Whilst Tozer

Reserve contains important environmental values, it is considered restricted open space from a recreational use point of view in its current state and does not replace the need for additional recreational open space.

Whilst it is not untypical for open space to be further distributed in a in a regional context, compared to a metropolitan context, the provision of local parks, active open space and connected walking trails need to be provided and equally distributed within the precinct itself to at least the standards of provision listed above. A current review of Open Space Contributions within Warrnambool recommends the use of a DCP to determine and apportion open space within the growth area.

Detailed planning of proposed facilities need refinement through discussion with Council.

4.6 Community services

4.6.1 Standard provision

The Warrnambool Community Services and Infrastructure Plan and Policy (which is included in the planning scheme) supports the provision of accessible, multipurpose and shared community services infrastructure delivered in partnership with other levels of government and community stakeholders.

The policy focuses on utilising shared multi-purpose community facilities or “hubs” that provide opportunities to strengthen community wellbeing, learning and social connection and:

- Are responsive to the changing needs of the community:
  - A hierarchy of provision based on industry recognised benchmarks
  - Flexible design that responds to changing community needs
  - Accessible for people of all ages and abilities
- Support the use of contemporary best practice service models and approaches
- Promote active transport
- Are environmentally sustainable
- Are planned in partnership with the community
- Co-locate and/or integrate with schools and other community services and organisations.
- Ensure efficient use of capital and recurrent funding sources (Federal, State, Local, Community service organisations, Private sector).

4.6.2 Existing Situation

There is limited community services infrastructure in the north east area. Existing services and facilities located in the area are summarised in the table below:

Table 1 – Community Services Audit – North East Warrnambool

Purpose	Facility	Address	4yo Places	3yo Places	Childcare Places
Kindergarten 3yo	Kings College	44 Balmoral Road		30	
Kindergarten 4yo	Goodstart Early Learning Warrnambool North	121 Whites Road	15		30
Kindergarten 4yo	Kings College	44 Balmoral Road	88		
Long Day Care	North Edge Childcare	11 Wangoom Rd			103
Non-Government Primary/ Secondary School	King's College K-12	44 Balmoral Road			

4.6.3 Response/ implications for PSP

The north east area is anticipated to have the greatest increase in population between 2016 and 2036 in Warrnambool. By 2036, id population forecasts prepared in December 2017 anticipate the following:

Table 2 – Population forecast to 2036 - North East Warrnambool

Age (years)	2016	2026	2036	Change 2016 - 2036
Babies/pre-schoolers (0 to 4)	301	478	509	+209
Primary schoolers (5 to 11)	452	666	732	+281
Secondary schoolers (12 to 17)	356	517	594	+238
Tertiary education/independence (18 to 24)	423	489	589	+166
Young workforce (25 to 34)	508	723	773	+264
Parents/ homebuilders (35 to 49)	801	1,115	1,257	+456
Older workers/ pre-retirees (50 to 59)	447	768	883	+437
Empty nesters and retirees (60 to 69)	381	566	784	+403
Seniors (70 to 84)	309	508	675	+365
Elderly aged (85 and over)	35	157	230	+195
Total persons	4,013	5,986	7,027	+3,014

(Source, id, 2017)

The Aberline to Horne Structure Plan aims to accommodate approximately 4000 new residents and so the following recommended additional services identified in the Community Services and Infrastructure Plan are considered to be conservative.

Based on this forecast, the level of demand for services in planning area 7, once the area is fully developed, is anticipated to be:

- 100 four-year-old kindergartens places (3-4 groups) *
- 100 three-year-old kindergarten places (3-4 groups) *
- 1 EFT Maternal and Child Health Nurse
- 4 playgroups
- 124.5 long day care places
- 125.5 outside school hours care places
- 2 small community meeting spaces
- 1 small to medium community meeting space
- 0.5 Youth space
- 0.5 Neighbourhood House space
- 0.5 Government Primary school
- Administrative office space for 7.5 EFT

*service demand estimates revised to meet current staff to student ratio requirements and 15 hours of funding per week for both 3 and 4-year-old kindergarten programs.

These service needs should be met in accordance with Council's Community Services and Infrastructure Plan & Policy 2013, through the provision of a neighbourhood-level community hub facility. The additional services and infrastructure anticipated above should be considered only as the basis for detailed service planning and infrastructure feasibility studies to define the specific needs for the future.

In any future planning, the scope and mix of services and facilities required to service the growth area should consider future service provision in neighbouring areas (especially the Brierly Reserve Community Hub).

4.7 Transport network

4.7.1 Existing situation

Roads

The Princes Highway and Hopkins Highway are the main roads into and out of Warrnambool. The growth corridor is readily accessed from both highways via Wangoom Road and Aberline Road to the north, Whites Road and Moore Street from the west and Gateway Road and Horne Road from the south.

Access to the area currently exists off Aberline Road, Horne Road and Wangoom Road.

Wangoom Road is a Council road which is generally orientated in an east-west direction. A speed limit of 80 km/h applies to Wangoom Road between Aberline Road and approximately 200m further to the east of Aberline Road. To the east of this section, the speed limit increases to 100 km/h. Wangoom Road is also a major on-road bicycle training and event circuit.

Horne Road is a Council road which extends between Wangoom Road to the north and Princes Highway/Raglan Parade to the south. Horne Road will support increasing industrial traffic from the Eastern Business Park.

Between Rogers Road and Dales Road, Horne Road has a divided carriageway that generally accommodates a single lane of through traffic in each direction. A formal bicycle lane and an indented kerbside parallel parking lane are provided along the eastern side of this section of Horne Road.

A speed limit of 80 km/h applies to Horne Road.

Horne Road and Wangoom Road may form part of a future bypass for Warrnambool. Further stakeholder discussions with VicRoads will be required to confirm this. **Aberline Road** is a Council road which is orientated in a north-south direction. Between Wangoom Road and Rawlings Drive, Aberline Road has an undivided carriageway (between 10.3 and 10.4m wide) which generally accommodates a single lane of traffic in each direction, in addition to a kerbside parallel parking lane on the western side.

Between Rawlings Drive and Boiling Down Road, Aberline Road has an undivided carriageway (between 8.5m and 9.8m wide) which generally accommodates a single lane of through traffic in each direction.

A speed limit of 80 km/h applies to Aberline Road between Wangoom Road and the northern edge of the residential estate to the south. This speed limit reduces to 60 km/h between the northern edge of the residential estate and Boiling Down Road.

Boiling Down Road is a Council road which extends between Aberline Road to the west and Horne Road to the east. Between Aberline Road and Gateway Road, Boiling Down Road has a 12.7m wide carriageway which accommodates a single lane of through traffic and indented kerbside parallel parking in each direction. A speed limit of 60 km/h applies to this section of Boiling Down Road.

Between Gateway Road and Horne Road, Boiling Down Road has an undivided carriageway (between 8.1m and 9.8m wide) comprising a pavement (at least 3.9m wide) that is partly sealed and partly compact gravel. A speed limit of 80 km/h applies to this section of Boiling Down Road.

Dales Road is a Council road which is orientated in an east-west direction and extends from Aberline Road/McKiernan Road before terminating approximately 40m to the east of Gateway Road. Between Aberline Road/McKiernan Road and its termination approximately 40m east of Gateway Road, Dales Road has a 9.7m wide carriageway (approx.) which accommodates a single lane of through traffic in each direction. Kerbside parallel parking appears to be permitted on both sides of Dales Road. The default urban speed limit of 50 km/h applies to Dales Road.

Active transport

The creation of permeable street network and supporting active transport network is important if the East of Aberline PSP is to be developed as a low carbon neighbourhood.

Connectivity (or permeability) refers to the directness of links and the density of connections in a transport network. A highly permeable network has many short links, numerous intersections, and minimal dead-ends. As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations, creating a more accessible and resilient transportation system.

Council is currently developing a Principal Pedestrian Network (PPN). The PPN process models pedestrian movements and identifies current and potential usage along routes to key destinations (community centres, shops, schools, public transport, and open space).

Active transport includes non-motorised forms of transport involving physical activity, such as walking and cycling. It also includes public transport for longer distance trips, as public transport trips generally include walking or cycling components as part of the whole journey.

- high levels of amenity, especially to key destinations such as workplaces, schools and shops,
- mixed land uses and densities to support active transport, and
- choices of destinations.

The location of key facilities such as shops and schools, close to homes and on the most convenient path between two major activity centres is key to ensuring a high level of active transport and will also help ensure the sustainability of commercial activities.

Public Transport

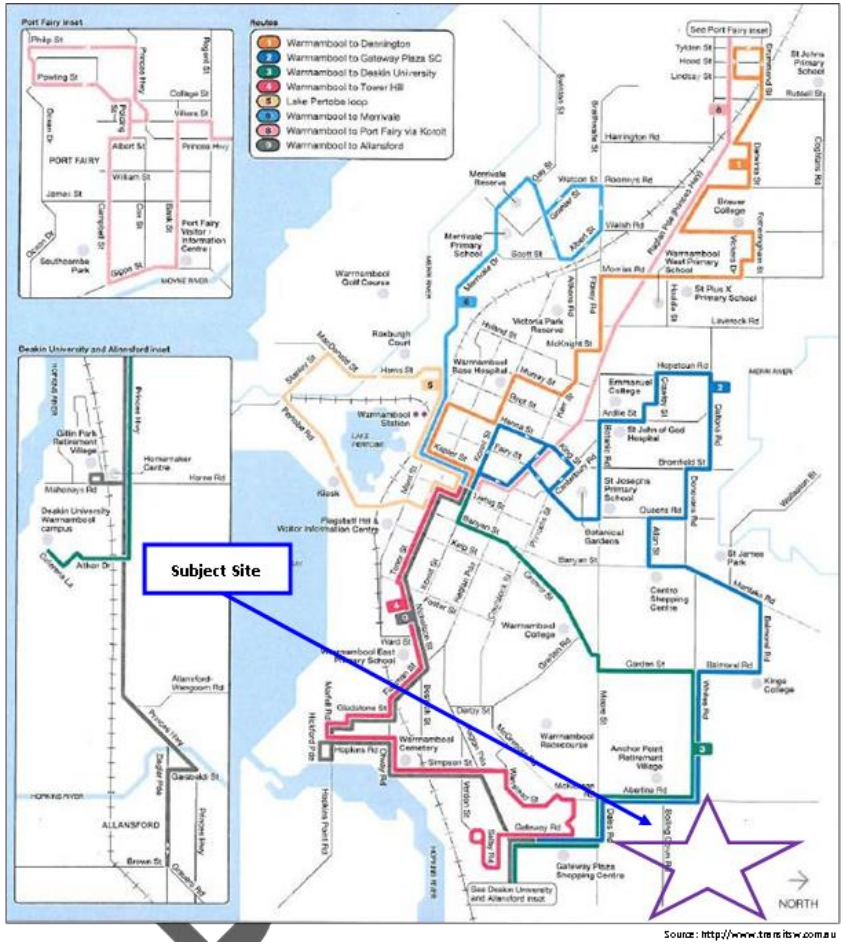
The following public transport routes operate within the vicinity of the subject site:

- Bus Route 2 operates along Whites Road, Aberline Road, Dales Road and Gateway Road. It provides a service between Warrnambool and Gateway Plaza Shopping Centre
- Bus Route 3 operates along Whites Road, Aberline Road, Dales Road and Gateway Road. It provides a service between Warrnambool and Deakin University

  Bus Route 4 operates along Caroville Drive, Karen Street and Gateway Road. It provides a service between Warrnambool and Tower Square.

The existing public transport network is shown in Figure 9.

Figure 9 – Existing Public Transport Network



4.7.2 Response/ Implications for PSP

Roads

It is expected that access to proposed development will come off the main three roads bounding the site, Aberline Road, Wangoom Road and Horne Road.

Within the growth area, the delivery of significant road infrastructure such as major intersections, signalised intersections, bridges, and upgrades of existing roads are typically delivered through a Developer Contributions Plan (DCP).

The delivery of major road infrastructure identified within a DCP may be provided as "Works in Kind" by the developer, who in turn is provided with credits against DCP liability for their development.

As a result of the proposed growth corridor and the key development sites within the surrounding area, the following upgrades are considered necessary to the existing road network:

- Upgrade Wangoom Road between Aberline Road and Horne Road to a Secondary Arterial road accommodating a single lane of traffic and a formal bicycle lane in each direction with no central median
- Upgrade Horne Road between Wangoom Road and Boiling Down Road to a Secondary Arterial road accommodating a single lane of traffic and a formal bicycle lane in each direction, separated by a central median. Upgrade Horne Road between Boiling Down Road and Princes Highway/Raglan Parade to a Primary Arterial road accommodating two lanes of traffic and a formal bicycle lane in each direction, separated by a central median

- Upgrade Aberline Road between Wangoom Road and Boiling Down Road to a Secondary Arterial road and a formal bicycle lane in each direction, separated by a central median. Vehicle access to properties fronting this section of Horne Road should be taken via an internal loop road or a service road running parallel to the main carriageway. Additional land will be required to accommodate splays and flaring at the relevant road intersections in order to achieve an appropriate intersection design
- No direct property vehicle access should be provided from Aberline, Horne and Wangoom Roads. Internal loop roads or service roads should ideally be provided parallel to these carriageways to provide access to these properties. This can be achieved by utilising part of the existing road pavement along this section of the road to be the loop/service road and deviating the main carriageway east into the subject site.

Traffic modelling of proposed road network and associated land uses has been completed for the precinct. It is estimated that the growth corridor will generate a conservative upper limit daily traffic volume of 40,000 vehicle movements, with 4,000 vehicle movements occurring during each of the commuter peak hours, based on a conservative assessment of 10 vehicles per day per lot and peak hour traffic generation in the order of 10%

The majority of traffic will be generated to/from the south and southeast towards the town centre and other major employment centres, such as the Gateway Plaza Shopping Centre, Eastern Activity Centre and the Horne Road Industrial Precinct.

Based on the ultimate projected daily traffic volumes on the road network a road hierarchy plan has been developed (refer Figure 10).

Further work by Council is required to assess the impacts and the likely upgrades required on the surrounding network that will result through the development of this PSP area, in particular through to Raglan Parade along Aberline and Gateway Roads and through to Mortlake Road along Whites Road and Wangoom Road.

All proposed roundabouts, signalised intersections and connections with the abutting arterial road network should be considered as part of a Development Contributions Plan (DCP) prepared in conjunction with the Structure Plan.

Standard template road cross sections and intersection treatments are planned for the precinct and will be confirmed during the development of the Precinct Structure Plan.

More detailed modelling works will be required to identify the relationship between road upgrade sections that are required prior to various staging scenarios,

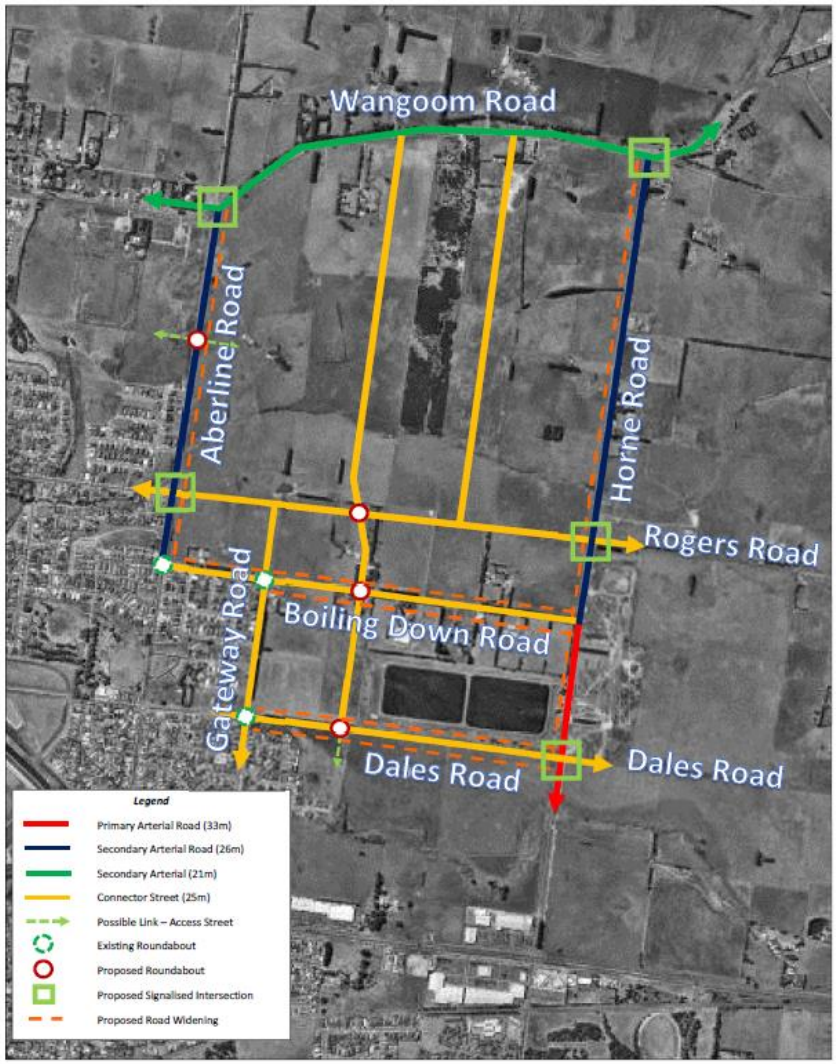
Active Transport

To support active transport, reduce car dependency and support low carbon footprint, the urban structure should include

- a permeable street network
- higher densities along main transport routes and
- key activities where transport routes intersect.

Shared paths should be provided adjacent to Russells Creek and Tozer Reserve, and any other reserves/open spaces within the PSP, with a cycling/walking trail outside the 30m buffer riparian zone, separate from the road corridor.

Figure 10 – Potential Road Hierarchy



4.8 Drainage and stormwater

4.8.1 Existing situation

The PSP area is within the Merri River Catchment. The primary waterway in the PSP area is Russells Creek which is a tributary of the Merri River and a drainage corridor. Smaller 'local catchments' are evident on the site and reflect the gentle undulating topography.

4.8.2 Response/ Implications for PSP

Greater work is required to determine the extent of flooding and overland flows. Stormwater will need to be appropriately managed to reduce run-off into Russells Creek. This will inform the preparation of a more detailed drainage and integrated water management strategy.

Structure planning will need to ensure that stormwater run-off is appropriately managed to improve the health of waterways. Key opportunities to providing innovative water cycle management solutions are listed below:

- Integration with and expansion of the existing Wannon Water roof rainwater harvesting scheme. If implemented over the entire development area this has the potential to significantly reduce the size and cost of the wetlands required to meet the best practice pollutant reduction targets. It will also provide an annual average yield of 523 ML to Wannon Water and reduce the increase in runoff into Russells Creek
- To reduce the peak flows on Russells Creek downstream of the development area. This would require a large embankment to be built across the valley upstream of Aberline Road. This could potentially reduce peak flows from approximately 30 m^3/s to 12 m^3/s which is a significant reduction. There would be some risks associated with managing the embankment structure to ensure that it is safe that would need to be considered.

- Further design work should be undertaken on the wetlands and retarding basin in particular to help improve the accuracy of the cost estimates.

4.9 Servicing

4.9.1 Water supply and Sewerage

Wannon Water is the responsible authority for sewer reticulation and potable water supply within the growth area.

Existing Water supply and Sewerage Infrastructure

There is existing reticulated sewer infrastructure adjacent to the PSP area on the west side of Aberline Road as well as to the south of Boiling Down Road. A stub has been built across Aberline Road close to the Russells Creek culverts as a part of previous development. Wannon Water advise that the existing sewer network does not have capacity for the proposed development area and will require a new pump station and rising main.

Current potable water infrastructure includes reticulation mains in Aberline Road, Boiling Down Road and the southern section of Horne Road. Wannon Water have indicated that these mains do not have capacity to service the PSP and new infrastructure will be required.

Proposed Sewer Infrastructure

The existing stub across Aberline Road would be the logical place to make the first connection from the development to the existing sewer network. However, the existing trunk sewer will not have capacity for the entire growth area. It is recommended that further investigations in conjunction with Wannon Water be undertaken to determine how much if any development can be connected into this existing network. This will allow timing requirements of new infrastructure to be more accurately determined and planned.

Advice from Wannon Water indicates that there will be new infrastructure requirements to service the development.

- A new sewerage pump station (SPS)
- A new dedicated rising main to transfer the sewage to the Warrnambool Water Reclamation Plant
- A new sewer trunk main along Russells Creek connected to the SPS.

The new SPS will need to be located close to where Russells Creek crosses Aberline Road. It will need to be sized so that it has the capacity and depth to service the whole growth area. To convey flows through the development to the new SPS, a 225-300mm diameter trunk sewer will need to be constructed along Russells Creek. A key consideration in the design of this Trunk sewer will be the location of crossings of Russel Creek and any significant flora/fauna sites that will influence this location. It may be preferable to construct a trunk sewer along each side of the creek and have one crossing close to Aberline Road as the crossing location will drive the sewer deeper. The site generally grades from east to west, so the trunk sewer will follow the natural contours of the land.

Advice from Wannon Water suggests that there is limited capacity in the existing trunk sewer system and a new rising main for the Warrnambool Water Reclamation Plant will need to be constructed to service the growth area. The alignment of this rising main is yet to be determined but it is recommended that this be resolved in conjunction with Wannon Water as early as possible in the planning process.

Proposed Potable Water Infrastructure

The existing pumps at the Tozer Road Water Pump Station will need to be upgraded in order to enable transfer water from the Warrnambool Water Treatment Plant via a new dedicated water main along the east side of Aberline Road to a new elevated water storage (water tower). The tower, location yet to be determined, is required to provide adequate water supply and pressure to the growth area. A ground level tank will also be required to ensure that there is adequate supply in times of peak demand and provide a secure water supply to

the area. The size and capacity of both the tower and storage tank will need to be determined by further modelling and advice from Wannon Water.

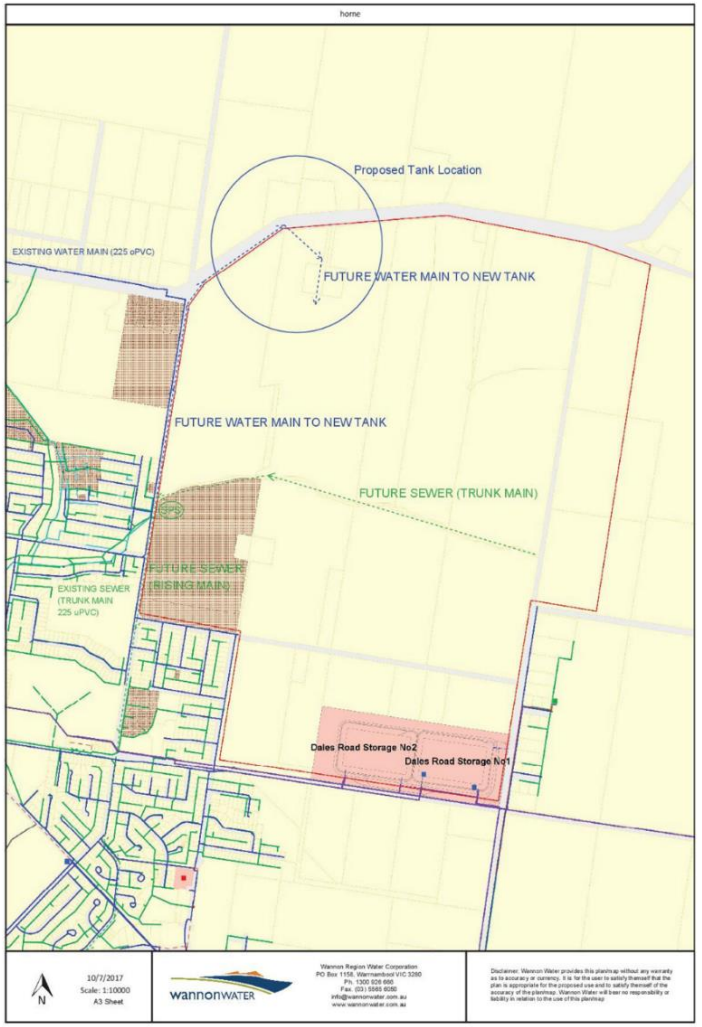
The key new water infrastructure required to service the area will include the following:

- Upgrade to Tozer Road Water Pump Station (WPS)
- New high-level water tower and ground level tank at the area
- New dedicated water main between the upgraded Tozer Road WPS and the proposed Water Tower. This main will located be on east side Aberline Road.

Reticulated water supply will be designed and constructed in accordance with Wannon Water and Water Services Association of Australia standards and requirements and will be provided by the developer at the time of development. Potable water supply pipelines will be located within road reserves or easements vested to the responsible authority.

The proposed water infrastructure is shown in Figure 11.

Figure 11 – Proposed Water Infrastructure



4.9.2 Electricity

Powercor is the responsible authority for electricity supply within the growth area.

Existing Electricity Infrastructure

A 22KVa underground power supply is located on the west side of Aberline Road, overhead on the east side of Horne Road and Low Voltage (LV) overhead along Boiling Downs Road east of Gateway Road and underground west of Gateway Road.

Advice from Powercor indicates there are currently two existing High Voltage (HV) feeder cables within the vicinity of the PSP area. One of these HV feeders is currently operating close to maximum capacity and will soon be maxed out by current development. The other has capacity for a further 3-4 stages of development (approx. 100 lots) before being maxed out. At this point a new HV feeder and potentially zone substation will be needed to be provided to the growth area.

The existing electricity infrastructure is shown in Figure 12.

Proposed Electricity Infrastructure

Powercor currently have no plans in place to increase power supply in the growth area. Average power consumption for a residential lot in the Warrnambool region is approximately 4KVa meaning that the fully developed requirement for the PSP would be in the order of 20MVa. Powercor's network will need to be significantly upgraded in order to meet this demand. This development would equate to approximately 20 x 1000KVa kiosks to be installed along with a large HV and LV underground network.

Application for the provision of electrical supply will be required to be made through Powercor at the time of development. Powercor's preference for the initial development connections are to be from conductors mentioned above that currently have capacity to provide supply to development. Further modelling will need to be undertaken by Powercor prior to development starting to determine the nature and level of external infrastructure upgrades required.

Figure 12 – Existing Electricity Infrastructure

Underground electrical infrastructure will be required to be provided as part of the development. During the permit application process, it is suggested that an overall servicing arrangement be undertaken by Powercor, to determine the preferred location of any substation. Reserves are required to be provided for this and have dimensions of approximately 3m x 5m.

Electrical infrastructure will be required to be designed and constructed in accordance with Powercor Australia requirements and at the cost of the developer.

New Customer rebates back to the developer may be applicable to the development subject to Powercor undertaking financial modelling of its revenue vs cost structures. If applicable, these rebates may be sought by the developer from Powercor post tie in of the new infrastructure to the existing electrical network by Powercor.

New technologies are becoming available, such as solar to battery storage, which can be implemented on a lot level or as part of the wider network infrastructure. Alternatives such as these may be explored further by Council or development proponents to determine the precise requirements and commercial and or sustainability benefits.

4.9.3 Telecommunications

Existing optic fibre networks exist throughout the Warrnambool Township to the west and south of the growth area. Construction of fibre has also commenced within the Horne Road Industrial Precinct.

Fixed wireless coverage is currently available to the development area. This is where data travels from a transmission tower to the premises via a rooftop antenna that needs to be installed by an approved NBN Co. contractor. This method would likely be the least preferable when fixed line services are available within the area.

NBN have rolled out services to surrounding developments and have indicated that the logical start point for development would be near the Russel Creek crossing near Aberline Road as it requires the smallest backhaul.

Under current NBN Co. policy, the developer is required to provide pit and pipe infrastructure as part of the development of the site, and NBN will provide the cabling at the time of first applications for connection of dwellings to the development. Backhaul charges are a shared cost between the developer and NBN Co.

4.9.4 Gas supply

Ausnet Services is the responsible authority for gas supply within the growth area.

Existing Gas Infrastructure

There is an existing 125mm diameter gas pipeline located within Aberline Road as well as Boiling Down Road which are the largest supply mains in the area. There are also gas supply assets to the west of Aberline Road within the existing developed area, and on the south side of Boiling Down Road. Existing gas infrastructure is shown in Figure 13.

Proposed Gas Infrastructure

Ausnet Services have advised that their existing infrastructure, shown below in Figure 13, is in close enough proximity and has capacity to supply the initial stages of development. Once the growth area nears half completion further modelling will need to be undertaken of the remaining site and any development within surrounding areas to determine any external augmentation works.

Upon receipt of development staging plans, Ausnet Services will undertake detailed modelling and network layout designs as needed.

It is expected that gas infrastructure within the development will be provided based on current Ausnet Services requirements. Current policy of Ausnet Services is such that a revenue vs capital

infrastructure cost calculation model determines the cost to development of any particular stage.

Figure 13 – Existing Gas Infrastructure

5 DRAFT VISION AND OUTCOMES

5.1 Principles for the plan

The following (draft) principles have been developed to define how the neighbourhood character and sense of place will be developed through the PSP process:

- Plan for environmental sustainability
  - Sustainable building design, including lot orientation
  - Low carbon neighbourhoods
- Integrate transport and land use planning
- Create a precinct with high amenity and character and manage land use conflicts at the edge of Warrnambool's settlement boundary
- Create diverse and vibrant new communities
- Protect biodiversity, waterways and cultural heritage values
- Create integrated open space networks
- Ensure the efficient and orderly provision of infrastructure and services.

5.1.1 Plan for environmental sustainability

The City of Warrnambool adopted a new environmental policy, Green Warrnambool, on (3 September 2018. Through this plan Warrnambool has the goal of becoming the most environmentally sustainable regional city in Australia. This will be achieved through six key goals outlined in Green Warrnambool (2018) and summarised below:

- *Zero Warrnambool* – Demonstrate innovative, smart solutions to achieve zero net emissions for a renewable future
- *Adaptable Warrnambool* – Adapt to the impacts of climate change
- *Wise Warrnambool* – Zero recoverable waste being sent to landfill by conserving, avoiding, reducing, recycling and reusing resources at every opportunity
- *Naturally Warrnambool* – Build knowledge, skills and involvement in protecting biodiversity, waterways and the coast for the benefit of current and future generations of people, flora and fauna
- *Blue Warrnambool* – Care for and regenerate our waterways, our coast and marine environment and support a natural water cycle. We will carefully use rainwater to contribute to the amenity of the city by bringing water management and green infrastructure together
- *Green Warrnambool* – Become a city in nature, connected by green infrastructure and corridors of urban forest to support resilient and connected biodiversity.

Green Warrnambool is a high-level, overarching strategic document that guides a suite of new and existing strategic plans and actions. Through its implementation, the City of Warrnambool aims to have zero net greenhouse gas emissions by 2040. The following opportunities have been identified as ways the PSP can assist in achieving the goals of Green Warrnambool.

A low carbon community

- Warrnambool will pave the way for a Zero Carbon Housing Development
- Pilot a Neighbourhood Energy Project.

- Warrnambool will trial micro-grid technology for decentralised energy production.
- Consider gas free community – all electric
- Highest possible standard Environmentally Sustainable Design (8 -10-star Nathers) – see The Cape for example https://www.liveatthecape.com.au/
- Best practice standards for embodied carbon management in construction materials
- Carbon neutral or positive for emissions related to operational energy for all buildings. http://www.yourhome.gov.au/housing/carbon-zero-carbon-positive
- All residential developments to include solar PV and battery storage (to generate more than consume. 10kw minimum for battery charging)
- All residential developments to include EV charging
- Consider the opportunity for community owned renewable energy generation, such as a solar or wind farm in proximity. Example ZNET Hepburn - a pilot approach working with the municipality of Hepburn to bring together residents, business, community orgs and business to move toward Zero Net Carbon
- Offset any remaining emissions with green power purchasing contracts for community.

A low waste community

- Recycling will be maximised and waste to landfill reduced
- Waste management systems will divert organic waste from landfills
- Construction and demolition waste recycling opportunities will be maximised through reuse and recovery of building materials
- Promotion of Community garden.

A climate adept community

- Climate resilient design in ESD
- Warrnambool will need to be resilient to extreme weather events – including flooding, drought and heat waves
- Ecological services, blue green infrastructure
- Address future urban heat island effect.

Further ideas on features of the growth area to support low carbon principles

- Canopy cover for trees to offset carbon and mitigate on heat/climate change impacts
- Building orientation – optimising passive solar energy
- Sustainable building technique and practice
- Permeable surfaces
- Integrated water management
- Urban design – neighbourhood design that limits car activity
- Good pedestrian and cycle links
- Good coverage of public transport
- Reticulated waste – see Maroochydore example
- Third pipe – roof water harvesting
- Incentives for solar or renewables
- High quality insulation
- Waterway health and management
- High tech and green features

- Streetlighting is led or efficient
- Recyclable materials for road pavement
- Climate change responsive
- UN sustainable development goals (refer to https://sustainabledevelopment.un.org/sdgs)
- Community garden space
- Smart poles
- Milestones for renewable energy provision
- CASBE design principles
- Built environment sustainable scorecard
- Commercial opportunities
- Display home / smart home.

5.1.2 Integrate transport and land use planning

Through the provision of linear open space corridors, particularly along watercourses and Tozer Reserve, the road network is supplemented by additional pedestrian and cycling links which will connect with the rest of the municipality in the long term.

Efficient road networks, complimented by trail networks, will provide for convenient bus routes within walking distance of most new dwellings to encourage reduced car dependency and support low carbon footprint.

Public transport nodes should be located within neighbourhood centres, with bicycle storage facilities to enable users to cycle and then connect with public transport.

5.1.3 Create a precinct with high amenity and character and manage land use conflicts at the edge of Warrnambool's settlement boundary.

The precinct is located within a high quality rural environment that is characterised by Russells Creek and Tozer Reserve. These attributes along with the physical site features discussed below, will inform the future built form and landscape character of the precinct. Russells Creek and Tozer Memorial Reserve provide strong opportunities for high amenity residential communities adjacent to establishing residential neighbourhoods along the west side of Aberline Road.

It is important that rural areas beyond the city's settlement boundary are protected to ensure agricultural uses remain viable and to ensure the City's unique rural character is protected from urban development. To this extent this precinct has an opportunity to strongly define the north eastern settlement boundary of Warrnambool.

5.1.4 Create diverse and vibrant new communities

The plan seeks, where possible, to retain existing features where they contribute positively to the new community and create diversity. Remnant vegetation, scattered tree specimens are all existing features that create a sense of place and origin for the future community. Key attributes able to be incorporated are likely to include some revegetation along natural watercourses. All of these components together provide a sense of geographical place and point of difference to the precinct which help builds community identity. The planning response to these attributes should also consider views, view corridors, road alignments and public open spaces that highlight and connect these characteristics with the future community through place and ensure other notable vantage points, and view lines are protected from inappropriate development.

The provision of a population of an adequate size and density to facilitate the delivery of local and regional infrastructure and services is a key element in creating vibrant communities. By optimising the overall lot yield the provision of services come earlier and evolve with

the growing community. The provision of a well-integrated road and trail networks also assists in facilitating vibrant communities by providing alternative development fronts and multiple connections to surrounding established and developing neighbourhoods.

The inclusion of a development staging plan will facilitate the creation of several distinct communities across the precinct.

5.1.5 Protect biodiversity, waterways and cultural heritage values

The significant biodiversity within the corridor particularly associated with Tozer Memorial Reserve is a key consideration for the precinct, as Tozer Memorial Reserve is known to support the EPBC Act listed Grassy Eucalypt Woodland of the Victorian Volcanic Plain ecological community and Growling Grass Frog. The Grey-headed Flying-fox and Southern Bent-wing Bat are also likely to use foraging resources within the PSP area on occasion

The PSP will need to address interface issues through its integrated waterway design and drainage systems, particularly related to the Russells Creek corridor. Cultural heritage values are also directly related to the natural waterways within the precinct as they form strong connections to the Aboriginal community's life on the land, their food supply and travel patterns. These connections will form the basis of open space along the Russells Creek corridor, enabling protection, enhancement, interpretation, education and passive recreational opportunities.

5.1.6 Create integrated open space networks

As discussed in a number of the above principles, the physical attributes and character of the precinct, and the natural waterway connection in association with existing and proposed transport networks provide, great opportunities for an extensive, integrated open space network. These networks do predominate across the centre of the precinct, naturally from the east to the west along Russells Creek, connecting to the southern end of Tozer Reserve.

5.1.7 Ensure the efficient and orderly provision of infrastructure and services

The development of this PSP not only stimulates the demand for physical infrastructure, it significantly funds the infrastructure provision. Key infrastructure works, including mains, drainage and road network will be required to enable the precinct to develop. These come at essentially a fixed cost regardless of urban density.

Typically, the net developable area of a precinct equates to 70% of a site's total area. Increased costs for infrastructure are incurred when the number of lots is reduced. Conversely if the number of lots provided is increased, then the cost of providing the physical infrastructure is decreased as the costs are spread across more sites.

The development and use of a DCP will determine and apportion infrastructure requirements, including open space within the growth area. The delivery of the proposed sustainability principles of this PSP will also be incorporated into the delivery of infrastructure elements within this PSP.

The inclusion of a development staging plan will facilitate orderly development sequencing across the precinct.

5.2 Creating a Vision

The Vision for this PSP will be developed through upcoming landowner and stakeholder engagement and will be included in an updated version of this paper.

At this stage it is envisaged that the PSP will be a predominantly residential precinct, with significant passive and active open space along the Russells Creek corridor and incorporating Tozer Reserve. The PSP will incorporate a mix of residential densities, a neighbourhood centre and required community facilities, and include linkages into the surrounding pedestrian, cycling and public transport corridors.

Importantly, the PSP will embody the principles of Green Warrnambool, and contribute to the city meeting the following goals (Green Warrnambool, 2018):

- (that) Warrnambool will be the most environmentally sustainable regional city in Australia.
- The City of Warrnambool will have zero net greenhouse gas emissions by 2040. Homes and businesses will use renewable energy for their energy needs.

This can be achieved by incorporating many of the principles and opportunities identified in Section 5.1 of this paper. Upcoming landowner and stakeholder engagement will confirm the vision, actions and opportunities that are feasible for inclusion the PSP.