

REPORT

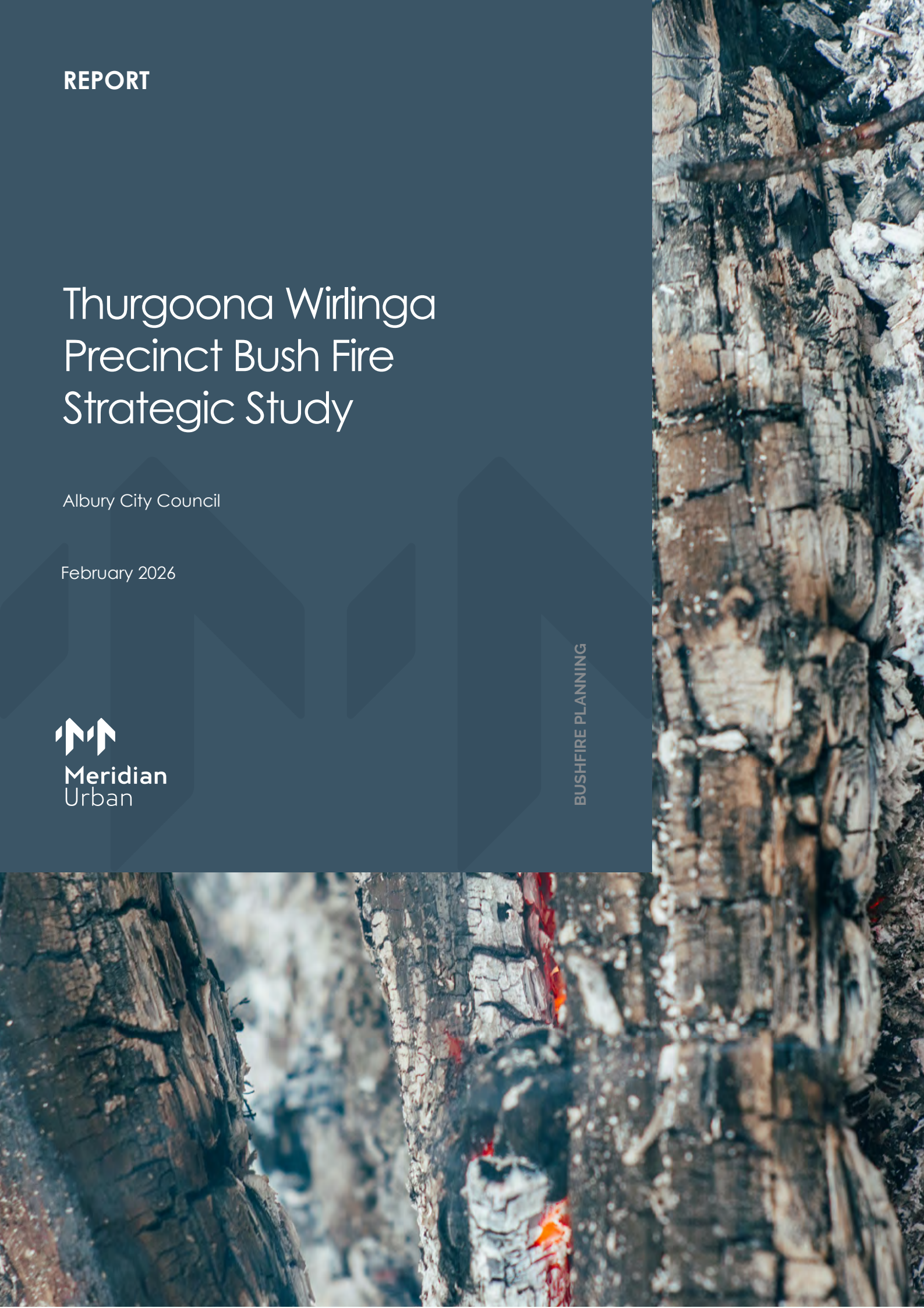
Thurgoona Wirlinga Precinct Bush Fire Strategic Study

Albury City Council

February 2026



BUSHFIRE PLANNING





ACKNOWLEDGEMENT OF COUNTRY

Meridian Urban acknowledges the Traditional Custodians of the lands and waters where we live and work.

As resilience practitioners we have a responsibility in listening to and elevating Indigenous voices through our practice, and meaningfully engaging in processes of reconciliation. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers, and pay our respect to Elders past and present.

Meridian Urban's 'Reflect' Reconciliation Action Plan (RAP) details our commitments to advancing cultural change, active participation and inclusive and informed approaches, with a focus on increasing economic and social equity for Aboriginal and Torres Strait Islander peoples and supporting First Nations self-determination. A copy of our RAP can be viewed online at meridianurban.com.

REVISION SCHEDULE AND QUALITY STATEMENT

Signature or typed name (DOCUMENTATION ON FILE)

Rev No.	Date	Description	Prepared by	Reviewed by	Approved by
1	17/12/2025	Draft Report	LG	LD	LG
2	11/02/2026	Report	LG	LD	LG
3	19/02/2026	Final Report	LG	LD	LG

FPAA NSW BPAD Accreditation No. 33131

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Member Natural Hazard Mitigation Association (USA)
Member of Association of Fire Ecology



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Executive Summary

This Bush Fire Strategic Study is prepared on behalf of Albury City Council to inform and support a Planning Proposal for amendments to the Albury Local Environmental Plan (LEP) 2010 and a Development Control Plan (DCP) in relation to the 2025 Thurgoona Wirlinga Structure Plan (as a revision of the 2013 Structure Plan).

Key observations identified by this study include:

- Albury City Council received early advice from NSW RFS prior to the preparation of the Planning Proposal, dated 31 October 2025, which has been fulsomely addressed by this Study.
- This Study has assessed the nature of proposed zoning changes from existing zoning under the Albury LEP 2010 from a risk-based perspective. It is acknowledged the Thurgoona Wirlinga Precinct is exposed to localised bush fire hazard as well as grassfire hazard however, it is located such that it has limited exposure to extensive landscape-scale fire runs. Grassfire hazard remains the dominant hazard type.
- This Study identifies that ability to comply with Planning for Bush Fire Protection (PBP) 2019 without unnecessary reliance on performance-based solutions can be achieved, and the nature of land use changes proposed is appropriate and able to be reasonably mitigated.
- The bushfire management controls proposed for incorporation into the DCP include provisions which ensure that mature fuel loads for vegetated corridors are assessed. This is included such that regardless of bush fire prone land mapping, the intent for the corridors is assessed.
- The Structure Plan area incorporates corridors that are intended to be re-vegetated over time. Despite the interface of potential future development with these corridors, the context of the Precinct remains relevant. Most corridors within the Precinct enter from the east, associated with grasslands. Opportunities exist as part of rehabilitation / landscape concept planning or as part of infrastructure design, to break the fuel connectivity of the corridors, on balance with environmental aspirations. Until this work is undertaken, the corridors are identified as potential bush fire hazard with associated asset protection zones identified.

This study is undertaken in accordance with the provisions of Chapter 4 of the Planning for Bush Fire Protection (PBP) 2019 Guideline, which relates to strategic planning activities.

The strategic planning principles set out at Chapter 4 of PBP 2019 outline the benchmarks for criteria against which strategic planning activities should be undertaken. The assessment of the planning proposal relative to the nature of bush fire risk is summarised as follows.

Assessment of Chapter 4 strategic planning principles

Chapter 4 principle	Strategic Assessment
Ensuring land is suitable for development in the context of bush fire risk	The 2025 Structure Plan, as a revision of the 2013 Thurgoona Wirlinga Structure Plan, continues to demonstrate suitability of land use in the context of bush fire exposure to hazard and risk. This study has explored the changes that are the subject of the Planning Proposal to consider the appropriateness of land use transition. Overall, the 2025 Thurgoona Wirlinga Structure Plan represents a balanced approach which integrates considerations

	of bush fire hazard and risk to mitigate potential for impact in the long term.
Ensuring new development on bush fire prone land will comply with PBP 2019	This study identifies the ability for compliance with Bush fire Protection Measures (BPMs) of PBP 2019 as they stand at the time of writing. Asset protection zones are identified, demonstrating ability to ensure development is separated from potential bush fire hazard.
Minimising reliance on performance-based solutions	This study identifies the ability for compliance with BPMs of PBP 2019 as they stand at the time of writing without unnecessary or undue reliance upon performance-based solutions.
Providing adequate infrastructure associated with emergency evacuation and firefighting operations	The 2025 Structure Plan is supported by detailed technical studies that have been undertaken for more than a decade, informing a detailed approach to forward planning and infrastructure services that aid emergency services.
Facilitating appropriate ongoing land management practices	This study has regard to ongoing land management, noting that changes over time may be regard as land uses transition from rural to urban. This is particularly amplified for the Bells Travelling Stock Reserve which presents level of hazard but which in itself, is a critical and much valued natural asset.

This study outlines the **planning controls** to be implemented to appropriately address bush fire hazard and risk through strategic planning. These are provided within the report.

In addition, three recommendations are made by the study to ensure observations identified by the study are reasonably addressed. These include:

1. Ensure regard for the Southern Border BFRMP is referenced in the site-specific Development Control Plan (DCP).
2. Ensure new patches and corridors of hazard that will be established as part of the Structure Plan are considered as part of the next iteration of Bush Fire Prone Land Mapping undertaken in partnership with the NSW RFS, to ensure future hazard is captured to enable development to anticipate and respond at an early phase, thereby enhancing long-term resilience (it is noted that some corridors and patches may not meet the mapping criteria, or detailed landscape concept design avoids these from becoming hazardous). This should occur at a time that coincides with updates to the Albury LEP as a result of the Structure Plan.
3. The revegetation of proposed corridors within the Precinct is undertaken in a manner that has regard to the generation of potential bush fire hazard. Opportunities to break the fuel connectivity of corridors either by infrastructure (such as roads) or via fire-wise planting areas is balanced alongside the environmental aspirations for the corridor network.

Compliance with Local Planning Direction 4.3

Local Planning Directions are issued by the Minister for Planning to relevant planning authorities under section 9.1(2) of the EP&A Act. These directions apply to planning proposals.

Local Planning Direction 4.3 – Planning for Bush fire Protection Schedule 1 is issued by the Minister for Planning, which applies to planning proposals. It has two objectives:

1. *Protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and*
2. *Encourage sound management of bush fire prone areas.*

Local Planning Direction 4.3 applies to planning proposals that will affect land that is, or is in proximity to, land mapped as bush fire prone land. As such, Local Planning Direction 4.3 applies to this planning proposal.

As demonstrated by this Bush Fire Strategic Study, the Planning Proposal complies with the specific aspects of Direction 4.3 as summarised below.

Direction 4.3(1)

In the preparation of a planning proposal the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service following receipt of a gateway determination under section 3.34 of the Act, and prior to undertaking community consultation in satisfaction of clause 4, Schedule 1 to the EP&A Act, and take into account any comments so made.

Compliance statement:

The purpose of this Study is to undertake a detailed assessment of the potential nature of bush fire risk being generated by strategic planning activities.

Albury City Council sought early advice from NSW RFS prior to the preparation of the Planning Proposal, and received early advice to Council dated 31 October 2025, which has been fulsomely addressed by this Study.

Direction 4.3(2)

A planning proposal must:

- a. *have regard to Planning for Bushfire Protection 2019,*
- b. *introduce controls that avoid placing inappropriate developments in hazardous areas, and*
- c. *ensure that bushfire hazard reduction is not prohibited within the Asset Protection Zone (APZ).*

Compliance statement:

This Bush Fire Strategic Study has regard to Chapter 4 of PBP, as required.

This Study has assessed the nature of proposed zoning from a risk-based perspective. It is acknowledged the Thurgoona Wirringa Precinct is exposed to localised bush fire hazard as well as grassfire hazard however, it is located such that it limits exposure to extensive landscape-scale fire runs.

APZs are identified around the perimeter of the Precinct that interfaces with potential hazard, and internal corridors that are intended to be rehabilitated. APZs identified by this Study demonstrate that development is capable of compliance with the APZ requirements of PBP 2019. It is noted that these may vary at detailed design stage. Despite this, the purpose of its examination at the strategic planning stage, per the Local Planning Direction, is to ensure that bushfire hazard reduction within the APZ is not prohibited or otherwise limited, which is confirmed by the APZs identified at **Appendix B**.

Direction 4.3(3)

A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:

- a. *provide an Asset Protection Zone (APZ) incorporating at a minimum:*

- i. *an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and*
 - ii. *an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,*
- b. *for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with,*
- c. *contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,*
- d. *contain provisions for adequate water supply for firefighting purposes,*
- e. *minimise the perimeter of the area of land interfacing the hazard which may be developed,*
- f. *introduce controls on the placement of combustible materials in the Inner Protection Area.*

Compliance statement:

Having regard to the compliance aspects identified above, this Study demonstrates that development is capable of compliance with the APZ requirements of PBP 2019. In addition and with specific regard to Direction 4.3(3), it is further noted that:

- Inner and outer APZs are identified. The environmental integrity of proposed corridors is maintained by ensuring outer APZs do not intrude into these locations.
- This Study identifies that ability to comply with PBP without unnecessary reliance on performance-based solutions can be achieved, and the nature of land use changes proposed is appropriate.
- The bushfire management controls proposed for incorporation into the DCP include provisions which ensure that mature fuel loads for vegetated corridors are assessed. This is included such that regardless of bush fire prone land mapping, the intent for the corridors is assessed.
- Despite the interface with corridors, the context of the Precinct must be considered. Most corridors within the Precinct enter from the east, associated with grasslands. Opportunities exist as part of rehabilitation / landscape concept planning or as part of infrastructure design, to break the fuel connectivity of the corridors, on balance with environmental aspirations. Until this work is undertaken, the corridors are identified as potential bush fire hazard with associated APZs.

Overall, this Bush Fire Strategic Study satisfies the requirements of Local Planning Direction 4.3 as well as the provisions of Chapter 4 of PBP 2019, demonstrating the appropriateness of the proposed zoning changes relative to potential bush fire hazard and risk.

Thurgoona Wirlinga Precinct Bush Fire Strategic Study

Bush Fire Strategic Study

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1 Introduction

Meridian Urban were engaged by Albury City Council to undertake a bush fire strategic study to support the preparation of a planning proposal which seeks amendments to the Albury Local Environmental Plan (LEP) 2010 to implement the 2025 Thurgoona Wirlinga Structure Plan (as a revision of the 2013 Structure Plan).

1.1 Purpose

This bush fire strategic study addresses the requirements of Local Planning Direction 4.3 which relates to planning for bush fire protection, in relating to a planning proposal which seeks to implement the 2025 Thurgoona Wirlinga Structure Plan through amendments to the Albury Local Environmental Plan 2010.

1.2 Project background and locality context

Located to the north-east of Albury CBD, Thurgoona Wirlinga is Albury's primary growth area. It covers an area of approximately 4,500 ha, approximately 15 per cent of the area of the Albury LGA. Existing development is primarily concentrated to the west of Kerr Road, while the eastern part of the precinct is subject to future development.

The precinct provides capacity to accommodate up to 50,000 people by 2060 to 2070.

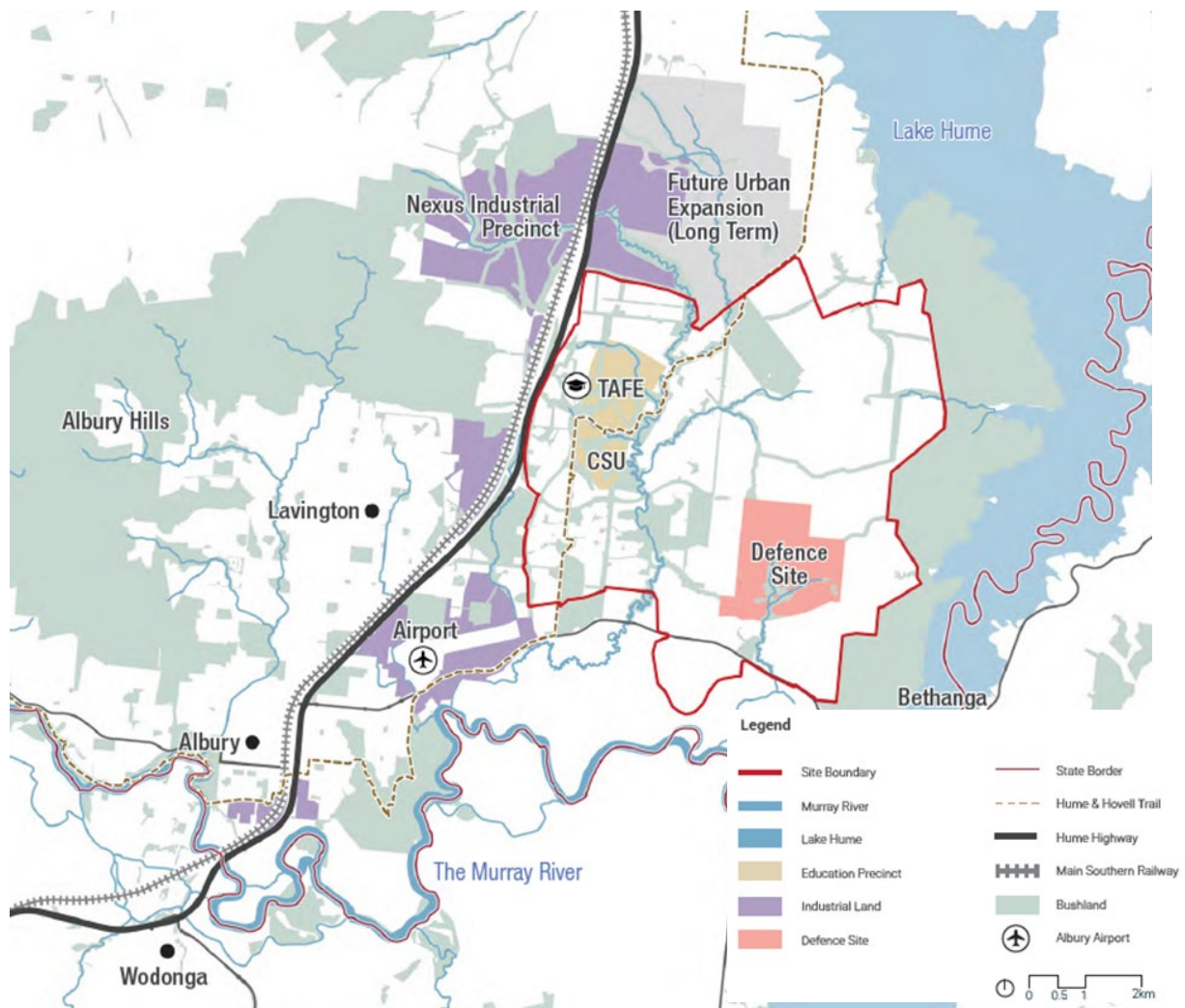


Figure 1-1: Thurgoona Wirlinga locality map (Source: Albury City Council, 2025)

Key existing land use features within the precinct include Charles Sturt University, NSW Riverina Institute of TAFE, Thurgoona Country Golf Club Resort and local shops. Existing social and community infrastructure includes the Thurgoona Primary School and Thurgoona Community Centre. A large area of Defence Force Land is also located in Wirlinga.

Notable features in the growth area include:

- Hillsides to the east and north-west of the precinct, with peaks at around 350m.
- Lake Hume to the east and the Murray River to the south of the precinct.
- Flora and fauna with significant biodiversity values (e.g. Sloane's Froglet, Gilgai wetlands, Regent Honeyeater).
- Eight Mile, Nine Mile and Woolshed Creeks, and associated tributaries, running in both north-south and east-west directions.
- Wiradjuri Aboriginal Cultural Heritage including archaeological sites, stone scatters, culturally scarred trees.
- Bells Travelling Stock Reserve.

The Thurgoona Wirlinga area was originally flagged for future development in the 1970's and the 2013 Precinct Structure Plan has helped shape the precinct's development for more than a decade. Whilst many of the 2013 Precinct Structure Plan principles remain relevant, much has since changed. The 2025 Structure Plan review process aimed to:

- Provide greater certainty to the community and investors about expectations for the future location and form of development
- Manage growth to ensure the precinct is a vibrant and attractive place to live, work and play
- Optimise the allocation of resources and investments in ways that most benefit the local community
- Create objectives to give effect to preferred development outcomes
- Incorporate key elements in response to community input and feedback.

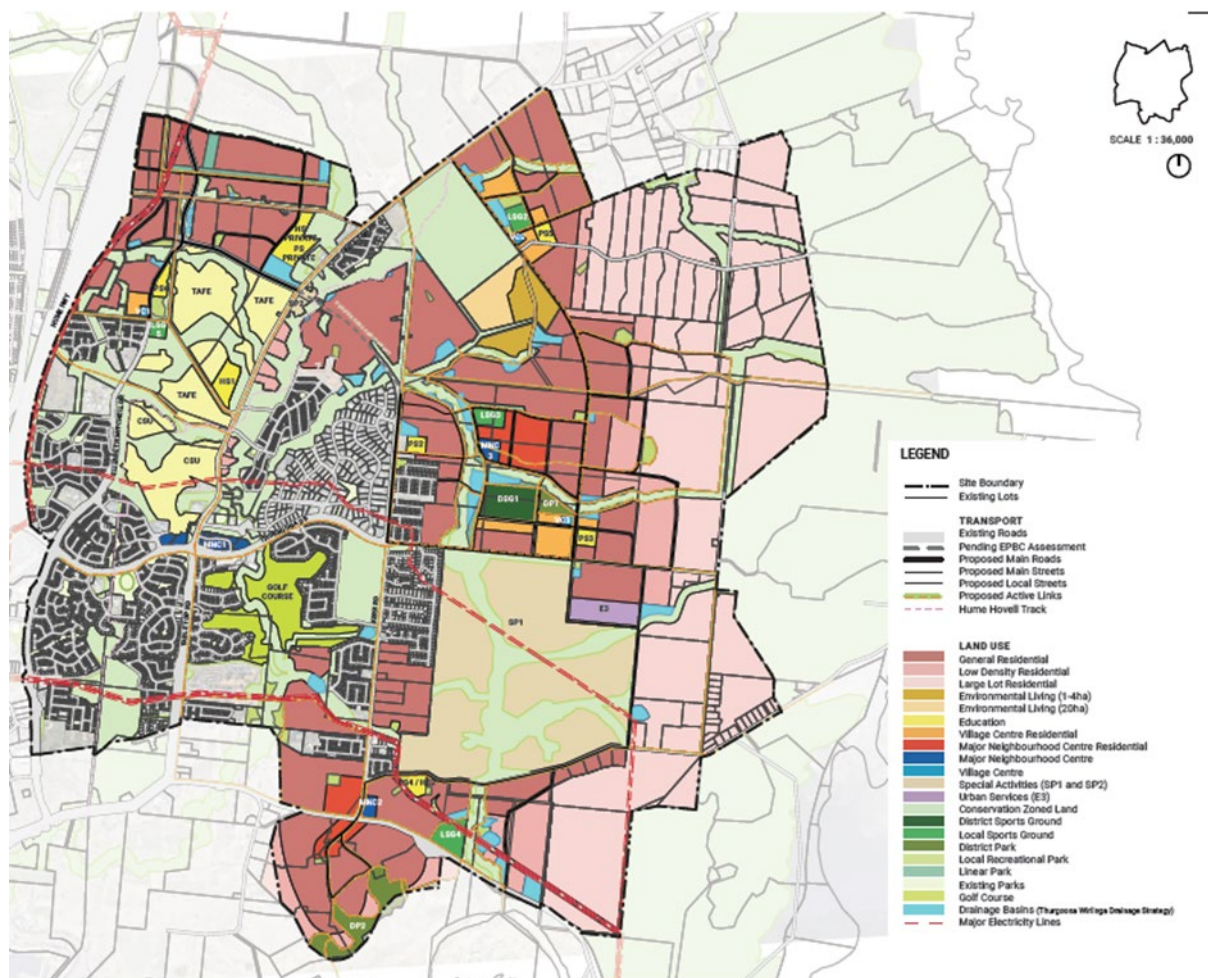


Figure 1-2: 2025 Structure Plan

The key changes from the 2013 Structure Plan include:

- Revised locations for shops and centres (Major Neighbourhood Centres and Village Centres), sportsgrounds, parks, some roads and schools.
- More defined areas of medium-density residential areas around centres
- More defined transition from urban residential areas to low-density and large lot residential areas on the eastern and southern precinct boundaries
- Adjusted land uses in key areas of biodiversity value (such as land uses near Bells Travelling Stock Reserve)
- Inclusion of drainage basin locations (as per the 2020 Drainage Strategy)
- Introduces a pocket of urban services land use (E3 Productivity Support zone) at the northern boundary of the Defence landholding
- Revises the proposed staging map to assist in an orderly and coordinated approach to development and align with the Water and Wastewater Master Plans
- Increased focus on implementation with an Action Plan outlining next steps such as completing land rezoning processes, planning amendments, additional studies.

As such, central to the consideration of this bush fire strategic study is the history of the strategic planning associated with the Structure Plan, including the 2013 Precinct Structure Plan which the 2025 revision seeks to iteratively advance. In essence, this is not a new strategic planning activity, but one which maintains a long history.



The 2025 Thurgoona Wirlinga Structure Plan was exhibited in mid-2025 with public submissions closing on 14 July 2025. Council has since considered all feedback received during the public exhibition period and endorsed the Structure Plan at the Council meeting on 8 December 2025. Council have since prepared a Planning Proposal for the Structure Plan which this study supports.

2 The planning proposal

The Planning Proposal to which this bush fire strategic study relates supports an amendment to the Albury Local Environmental Plan 2010 (Albury LEP 2010) in relation to land within the Thurgoona Wirlinga Precinct, which is the Albury local government area's primary growth area.

The Planning Proposal aims to rezone the Precinct in line with the land use and built form objectives outlined in the Council-adopted 2025 Thurgoona Wirlinga Precinct Structure Plan. The 2025 Structure Plan provides a framework for coordinated growth, focusing on biodiversity protection, the location of new centres, parks and open spaces, and appropriate residential densities.

The following section provides an outline of the planning proposal intent. An assessment of the planning proposal and the statutory provisions which are relevant to bush fire strategic studies is included at Section 5 of this report.

2.1 Proposed amendments to the Albury LEP 2010

The Thurgoona Wirlinga Growth Area is designated as an 'Urban Release Area' on the Urban Release Area Map within the Albury LEP 2010. The planning proposal will facilitate coordinated urban expansion, establishment of new centres, and the delivery of diverse housing within the Thurgoona Wirlinga Urban Release Area.

The proposed amendments to the Albury LEP 2010 are summarised as follows.

2.1.1 Zones and land use

The following is a summary of the key zoning and land use changes proposed:

- Rezone some land from R1 General Residential to E1 Local Centre zone for the Village Centre Commercial areas
- Rezone some land from R1 General Residential to E2 Commercial Centre zone for the Major Neighbourhood Centres identified within the Structure Plan
- Rezone some land from R1 General Residential to MU1 Mixed Use Zone adjacent to Major Neighbourhood Centres identified within the Structure Plan
- Rezone some land from R1 General Residential to R3 Residential Medium Density Residential Zone that applies to centres identified within the Structure Plan
- Rezone some land from R1 General Residential and R5 Large Lot Residential to R2 Low Density Residential
- Rezone some land from R1 General Residential to RE1 Public Recreation zone for future sportsgrounds and district parks
- Rezone some land from C3 Environmental Management to RE1 Public Recreation for a future sportsground
- Rezone some land from R1 General Residential to E3 Productivity Support zone at the northern boundary of the Defence Force landholding
- Rezone some land from R1 General Residential to C4 Environmental Living.

2.1.2 Density and built form standards

The Planning Proposal seeks to implement amendments to the existing built form controls that apply to the precinct and introduce minimum dwelling density controls. The changes proposed to the Albury LEP 2010 are summarised at the table below.

Table 1: Summary of proposed density and built form changes

Zone	Max. FSR	Max HOB.	Min. Lot Size	Min. Dwelling Density
E1 Local Centre	N/A	16m	N/A	N/A
E2 Commercial Centre	N/A	20m	N/A	N/A
R3 Medium Density Residential – that applies to Village Centres Residential (2025 Structure Plan)	N/A	12m	Nil	15 dwellings per hectare
MU1 Mixed Use zone for Major Neighbourhood Residential (2025 Structure Plan)	N/A	16m	Nil	20 dwellings per hectare
R2 Low Density Residential	N/A	N/A	2000m ² to 2,500m ²	N/A
RE1 Public Recreation	N/A	N/A	N/A	N/A
E3 Productivity Support	N/A	N/A	N/A	N/A
C4 Environmental Living	N/A	N/A	2Ha to 20Ha	N/A

A supporting draft Development Control Plan (DCP) has also been prepared to accompany this Planning Proposal and includes supporting controls to guide future development within the precinct.

Bushfire management objectives and controls proposed within the DCP are discussed at Section 5.

2.1.3 Urban release area

It is proposed to amend the Urban Release Area Map to capture the full boundary of the growth area, in accordance with the 2025 Structure Plan. This change is sought to align with the 2025 Structure Plan and other endorsed strategic plans and documents which identify the broader Precinct as part of the growth area.

2.1.4 Land reservation acquisition

The Planning Proposal seeks to identify district parks and local and district sports grounds shown on the 2025 Structure Plan for acquisition by Council. The acquisition of necessary land and embellishment will be funded through an update to the Albury Local Infrastructure Contributions Plan 2025.

2.2 The Thurgoona Wirlinga Structure Plan

The Thurgoona Wirlinga Structure Plan report dated November 2025 outlines the:

- Intent of the 2025 Structure Plan
- Regional context

- Planning framework
- Demographic profile
- Environmental context
- Specific planning attributes of the 2025 Structure Plan.

The 2025 Structure Plan is intended to be read in conjunction with this bush fire strategic study, noting elements, such as population forecast is relevant to the consideration of bush fire risk and the attributes of potential future residents and occupants of land uses proposed.

2.3 2013 Thurgoona Wirlinga Structure Plan Technical Report

The 2013 Structure Plan was underpinned by a comprehensive technical assessment completed by RPS¹. It included an assessment of bushfire risk management, having regard to the then 2006 version of PBP which was superseded in 2019. The 2006 version of PBP did not comprise any strategic planning provisions, which is now addressed at Chapter 4 of PBP 2019.

As such, the risk management component of RPS' reporting focused on bush fire protection measures (BPMs) specified by the former version of PBP. This largely included specification of the measures contained within PBP 2006 and how they were achieved by the 2013 Structure Plan. It is noted this is now not the intent of Chapter 4 as it does not seek an assessment against BPMs, but rather an assessment at a strategic scale of the appropriateness of the land use change that is proposed. This is therefore the focus of this Study, relative to the yet-to-be-developed portions of the Structure Plan area.

2.4 Consultation with NSW RFS

NSW Rural Fire Service was approached by Council for comment on the draft 2025 Structure Plan during the exhibition process in 2025. NSW Rural Fire Service responded by way of written feedback dated 31 October 2025. It noted that a Bush Fire Strategic Study is required pursuant to Chapter 4 of PBP 2019 to accompany a planning proposal, and the study should, as a minimum:

- Provide a bush fire landscape assessment that incorporates an assessment of any offsite measures that may be required and how these can be formalised.
- Provide an indicative traffic study to support the proposed road network in dealing with evacuating residents and responding emergency services. The traffic study should be based on the existing and proposed community profile and allow for cumulative impacts of evacuations from surrounding areas.
- Consider servicing and infrastructure delivery for the proposal and should include the consideration of operational response for emergency services. In considering future operational firefighting infrastructure, the proponents should:
 - identify what servicing arrangements are required for future development;
 - identify whether proposed servicing arrangements for the development are practical; and
 - discuss any issues that may result from the interplay of service delivery options.

NSW Rural Fire Service also stated that the following matters, specific to Thurgoona Wirlinga, should be considered as part of the study:

¹ 2013 Thurgoona Wirlinga Structure Plan Technical Report, RPS Australia, Available online at <https://www.alburycity.nsw.gov.au/strategies-and-plans/thurgoona-wirlinga-precinct-structure-plan>

- Where staged development is to occur Council should consider appropriate mechanisms to ensure that undeveloped areas do not constitute a hazard to areas being developed.
- As development occurs Council may wish to consider updating the Bush Fire Prone Land Mapping to reflect the extent of managed land.
- Where public open space may be reliably considered to be managed land a formal plan of management that addresses fuel management should be considered.
- Where natural features, such as riparian areas, are to be enhanced/rehabilitated consideration should be given to any potential impacts on bush fire protection measures for existing and proposed development.

All of the items raised by NSW Rural Fire Service above are addressed by this Study, over the sections that follow.

3 Local policy context

The following strategic planning context is drawn from the 2025 Thurgoona Wirlinga Structure Plan.

3.1 Riverina Murray Regional Plan

The Riverina Murray Regional Plan 2041 sets the framework, vision and direction for strategic planning and land use planning in the region.

This review is generally consistent with the following key objectives under the Riverina Murray Regional Plan:

- Protect, connect and enhance biodiversity throughout the region;
- Support housing in regional cities and their sub-regions;
- Ensure housing supply, diversity, affordability, and resilience;
- Strategically plan for health and education precincts;
- Support Aboriginal and Torres Strait Islander aspirations through land use planning; and
- Plan for resilient places that respect local character.

The Regional Plan also notes that 'Albury is the fastest growing centre in the Riverina Murray region, and this will continue with the Thurgoona/ Wirlinga Growth Area in the north east expected to provide more than 22,000 new homes (approximately 40 years supply). Growth in this area is supported by comprehensive structure planning' (Page 32).

3.2 Albury Local Strategic Planning Statement

The Albury Local Strategic Planning Statement (LSPS) 2020 sets out the vision for Albury City, how change will be managed and identifies 12 local land-use priorities.

The review gives effect to the 12 priorities with a particular focus on Priority 1: Infrastructure supporting new development and Priority 7: Coordinated and well-planned growth precinct (Thurgoona Wirlinga). The Structure Plan area is identified for urban expansion within the LSPS which was approved by the NSW Government prior to its release.

Priority 10 of the LSPS relates to adapting to the impacts of urban and natural hazards and climate change which notes the Albury City's exposure to bush fire hazards.

3.3 Local Environmental Plan 2010 and Development Control Plan 2010

The Albury Local Environmental Plan (LEP) 2010 outlines the planning controls in Albury City. It sets out what development types are permissible in each zone, including their legal definitions. It also contains key development standards and provisions to address local land constraints.

Part 6 of the LEP outlines requirements for development in Urban Release Areas (URA), of which Thurgoona Wirlinga is the primary URA for Albury. This includes arrangements for designated State public infrastructure, public utility infrastructure and requirements for the preparation of a development control plan for development on land in a URA.

The Albury Development Control Plan (DCP) 2010 provides detailed planning and design guidelines to support the planning controls set out in the Albury LEP when designing a development. It contains several parts, maps and appendices to refer to depending on the proposed development.

Part 19 of the Albury DCP contains objectives and controls to guide development in URAs. It includes the requirement to comply with the provisions of the LEP which relate to URAs.

3.4 Bush fire prone land map

Bush fire prone land is an area of land that can sustain or is likely to be subject to bush fire threat. Bush fire prone areas are defined as those areas containing or within:

- 100m of Category 1 vegetation (high risk); or
- 30m of Category 2 (lower risk) or 3 (medium risk) vegetation.

Albury City's Bush Fire Prone Land Map was most recently updated in September 2025 and certified by the Commissioner of the NSW Rural Fire Service by way of spot change. The current Bush Fire Prone Land Map is illustrated below, overlaid with the Structure Plan area boundary and within the broader landscape context.

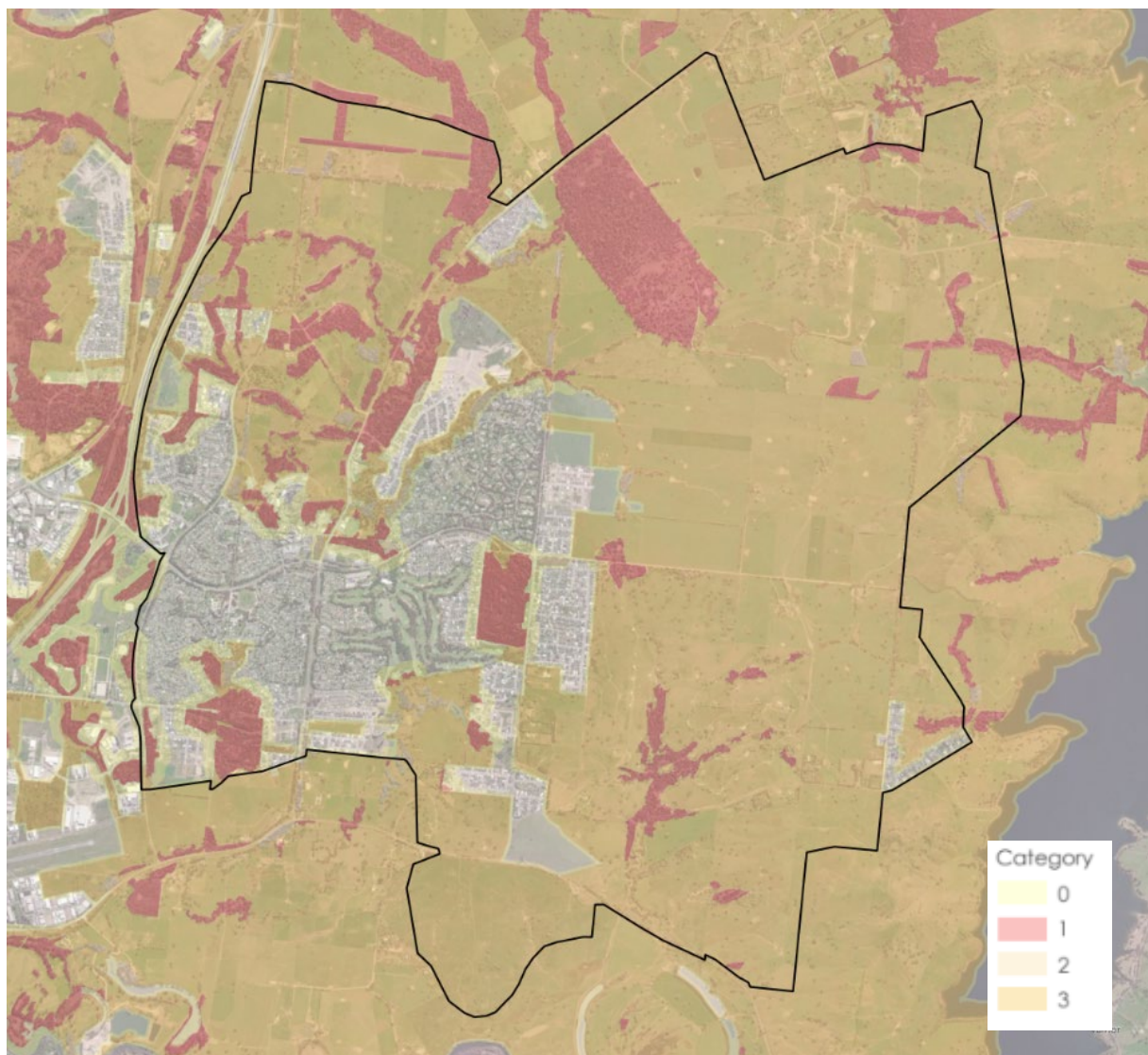


Figure 3-1: Bush Fire Prone Land Map for the Thurgoona Wirlinga Structure Plan area

The majority of the Structure Plan area is identified as subject to Category 3 vegetation hazard which is dominated by grasslands. It is higher risk than Category 2 vegetation but lower than Category 1, per the NSW Rural Fire Service's Guideline for Councils to Bush Fire Prone Land Mapping.

62 per cent (over 2,860ha) of the Structure Plan area is subject to Category 3, followed by the buffer (5 per cent of the Structure Plan area), Category 1 at 3 per cent (143ha) and Category 2 at 0.05 per cent (2.5ha). This trend is continued for land surrounding the Structure Plan area.

Exposure becomes more fragmented in proximity to existing urban areas however, the hazard in these locations is also dominated by Category 1 fuels which reflects tracts of urban bushland which have been retained.

The balance of this study examines the 2025 Structure Plan and Planning Proposal intent relative to the bush fire hazard context illustrated by the certified Bush Fire Prone Land Map.

3.5 Draft Southern Border Bush Fire Risk Management Plan

Under the *Rural Fires Act 1997*, a Bush Fire Risk Management Committee (BFRMC) must be formed for local authority (Council) area where there is a reasonable risk of bush fire and requires the preparation of an associated bush fire management plan. A bush fire risk management plan is a strategic document prepared for a local council area that identifies community assets at risk from bush fire and strategies to protect these assets.

Albury City local government area is identified as part of the Southern Border BFRMC area. A draft Southern Border Bush Fire Risk Management Plan (BFRMP) has been publicly exhibited and the BFRMC is currently considering stakeholder feedback, incorporating learnings from the Black Summer fires, of which 34,283 hectares within the Southern Border region was burnt.

At the time of writing, the new Southern Border BFRMP was not prepared in time for it to be considered as part of the planning proposal, but it should form part of strategic planning activities undertaken by Council and any updates to its strategic planning documents moving forward, ensuring it informs an understanding of risk (not just hazard) and how risk can be minimised / mitigated through planning processes.

RECOMMENDATION: Ensure regard for the Southern Border BFRMP is referenced in the site-specific Development Control Plan (DCP). Refer to Section 5 of this report for further detail.

The draft Southern Border BFRMP considers four (4) categories of assets, each with sub-categories, including human settlement, economic, environmental and cultural. Albury is one of the 20 focus areas identified by the draft BFRMP. The majority of the Structure Plan area is captured within the Albury focus area.

The draft BFRMP highlights the risk of fire run, noting this is mostly from the northwest of Albury City. The overall risk category level is low to Moderate, and Moderate to High for economic assets across the city. Low levels of risk awareness amongst the resident population is identified and evacuation may present challenges on certain routes through the area, though ability to access the evacuation network is considered to be 'good'.

A volume of asset protection zones are identified to be located in Thurgoona and Wirlinga at Appendix A of the draft BFRMP.

The existing Hume BFRMP which includes Albury City remains in place until the Southern Border BFRMP is endorsed and takes effect. At the time the Hume BFRMP was prepared, it noted that main sources of ignition were:

- Escapes from burning off
- Lightning
- Farm machinery (summer crop harvesting)
- Travelling public
- Trains

- Incendiarism².

3.6 Albury City Local Emergency Management Plan

The Local Emergency Management Plan (LEMP) articulates the context of the LGA, including key transport networks, demographics, key centres, land uses, and climate and weather conditions.

Bush fire and grass fire is identified as an **‘extreme’ risk for the LGA**, with a likelihood of ‘likely’ and a consequence rating of ‘major’. Council is not the responsible combat agency, as under the Rural Fire Act 1997 this responsibility lies with the NSW Rural Fire Service. The LEMP refers to the BFRMP in place for the region.

² Hume BFRMP, NSW Rural Fire Service, Available at <https://www.rfs.nsw.gov.au/plan-and-prepare/know-your-risk/bush-fire-risk-management-plans>

4 Strategic bush fire advice

4.1 Statutory requirements

Planning for Bush Fire Protection 2019 (PBP 2019) provides a series of development standards for designing and building on bush fire prone land. It also triggers additional planning and development controls on bush fire prone land for any new development or building work. As the Structure Plan Area contains mapped bush fire prone land, PBP 2019 is applicable. PBP 2019 is also used to give effect to the Building Code of Australia's Australian Standard AS3959-2009 'Construction of Buildings in Bush Fire Prone Areas'.

Two main phases for planning are provided by the NSW land use planning framework including:

- Strategic planning; and
- Development assessment.

4.1.1 Strategic planning

Strategic planning is the preparation of planning instruments and policies and includes the making of Local Environmental Plans (LEPs), Development Control Plans (DCPs) and planning proposals. This extends to the studies which inform these plans, such as local housing strategies and growth management strategies, ensuring bush fire hazard and risk is contemplated at the front end of the planning process.

Chapter 4 of PBP 2019 provides that strategic bush fire planning and studies are needed to avoid high risk areas, ensure that zoning is appropriate to allow for adequate emergency access, egress, and water supplies, and to ensure that future compliance with PBP 2019 is achievable. It further states that **the most important objective for strategic planning is to identify whether new development is appropriate subject to the identified bush fire risk on a landscape scale.**

Appropriate consideration of bush fire hazards at the strategic planning phase is required by **Section 9.1(2) of the EP&A Act and also by PBP 2019, and should be considered in applying the Section 9.1 Local Planning Directions – 4.3 Planning for Bushfire Protection Local Planning Direction.** PBP 2019 also notes that the NSW Rural Fire Service be consulted with during the preparation of any Planning Proposals involving BFPL. This assessment is provided as follows in Sections 4 and 5 of this BFSS.

Chapter 4 of PBP 2019 includes several broad **strategic planning principles** land use planning must consider, these are:

- Ensuring land is suitable for development in the context of bush fire risk
- Ensuring new development on bush fire prone land will comply with PBP 2019
- Minimising reliance on performance-based solutions
- Providing adequate infrastructure associated with emergency evacuation and firefighting operations
- Facilitating appropriate ongoing land management practices.

Chapter 4 also provides **indicators of inappropriate development.** These include:

- The development area is exposed to a high bush fire risk and should be avoided
- The development is likely to be difficult to evacuate during a bush fire due to its siting in the landscape, access limitations, fire history and/or size and scale
- The development will adversely affect other bush fire protection strategies or place existing development at increased risk

- The development is within an area of high bush fire risk where density of existing development may cause evacuation issues for both existing and new occupants
- The development has environmental constraints to the area which cannot be overcome.

Strategic development proposals in bush fire prone areas require the preparation of a strategic bush fire study. A strategic bush fire study must include as a minimum:

Table 4-1: Bush fire strategic study requirements excerpt from Chapter 4 of PBP 2019

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Bush fire landscape assessment	A bush fire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	➤ The bush fire hazard in the surrounding area, including: ➤ Vegetation ➤ Topography ➤ Weather ➤ The potential fire behaviour that might be generated based on the above; ➤ Any history of bush fire in the area; ➤ Potential fire runs into the site and the intensity of such fire runs; and ➤ The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	➤ The risk profile of different areas of the development layout based on the above landscape study; ➤ The proposed land use zones and permitted uses; ➤ The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site); and ➤ The impact of the siting of these uses on APZ provision.
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	➤ The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile; ➤ The location of key access routes and direction of travel; and ➤ The potential for development to be isolated in the event of a bush fire.
Emergency services	An assessment of the future impact of new development on emergency services.	➤ Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/brigades; and ➤ Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.
Infrastructure	An assessment of the issues associated with infrastructure and utilities.	➤ The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants; and ➤ Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management.	➤ Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.

The following assessment and analysis address the 'strategic issues' identified by the strategic bush fire study requirements provided by Chapter 4 of PBP 2019 to inform this Thurgoona Wirlinga Precinct BFSS.

4.1.2 Development assessment

Whilst this study is for the purpose of strategic-level planning, it is relevant to consider the implications for development assessment. This is particularly the case given the status of Thurgoona Wirlinga as a URA under the Albury LEP 2010, and cascading provisions that exist for development noted at Section 2.4.3 of PBP 2019 for streamlined assessment on land in URAs.

At the development assessment phase, development on land that is identified as bush fire prone land must comply with PBP 2019. Development on bush fire prone land is captured by Section 4.14 of the EP&A Act and must comply with the aim and objectives of PBP 2019.

Section 4.14 of the EP&A Act requires the consent authority (i.e. Council) be satisfied that the relevant specifications and requirements of PBP 2019 are complied with for development on bush fire prone land. Any development on bush fire prone land will need to demonstrate to the consent authority that the development conforms with PBP 2019. This can be demonstrated through a certificate by a suitably qualified consultant stating that development conforms with PBP 2019. If the development does not conform, the consent authority may still grant approval, subject to consultation with the Commissioner NSW Rural Fire Service confirming the development protects people, property, and the environment from the risk of bush fire.

The aims and objectives of PBP 2019 provide for:

- Affording buildings and their occupants protection from exposure to a bush fire;
- A defensible space to be located around buildings;
- Appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- Appropriate operational access and egress for emergency service personnel and occupants is available;
- Ongoing management and maintenance of BPMs; and
- Ensuring that utility services are adequate to meet the needs of firefighters.

It is therefore relevant insofar as this study relates, to identify locations or circumstances where potential for non-compliance with aims and objectives or development control provisions of PBP 2019 could arise. In particular, where reliance upon a performance-based solution may be required, as an indicator of an issue for strategic planning to address at an early phase, thereby avoiding issues in the first instance or deferring them through to development assessment.

4.2 Bush fire landscape assessment

The first aspect of a strategic bush fire study focuses on the bush fire hazard landscape, having regard to the assessment considerations outlined below.

Table 4-2: PBP 2019 strategic bush fire landscape assessment requirements

Issue	Detail	Assessment considerations
Bush fire landscape assessment	A bush fire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	- The bush fire hazard in the surrounding area, including: - Vegetation - Topography - Weather - The potential fire behaviour that might be generated based on the above; - Any history of bush fire in the area; - Potential fire runs into the site and the intensity of such fire runs; and - The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.

The above assessment considerations are addressed as follows.

4.2.1 Vegetation communities

Vegetation classification is important for a number of reasons, namely it is an indicator of the level of fire intensity and fire behaviour associated with specific types of vegetation and it also indicates the fuel loads which may exist in certain locations.

From a landscape perspective, historical development of agricultural land and conversion of land use from its natural form for the purposes of grazing and cropping in the region is evident and thus, it is a significantly modified landscape.

Albury is located in the South West Slopes Bioregion. Areas near creeks and rivers are largely River Red Gum woodland, low gently undulating country is Box or Blakely's Red Gum woodland and the hilly country and ranges is classified as White Box and Red Gum woodland³.

Three key vegetation classes have been identified by the Level 1 Biodiversity Assessment conducted as part of the Structure Plan. This provides a higher level of data than is available via SEED.

For the purposes of this Study, a uniform fuel load attributes to the Upper Riverina dry sclerophyll forest classification is adopted as reflective of both existent vegetation within and around the Structure Plan area but also for new corridors and areas of vegetation which are intended to be revegetated and rehabilitated as a result of the Structure Plan. The natural areas of the Structure Plan are illustrated at the figure below which incorporates the proposed Conservation zone land.

³ AlburyCity LEMP, 2017, Available online at <https://www.alburycity.nsw.gov.au/strategies-and-plans/alburycitys-local-emergency-management-plan-emplan>

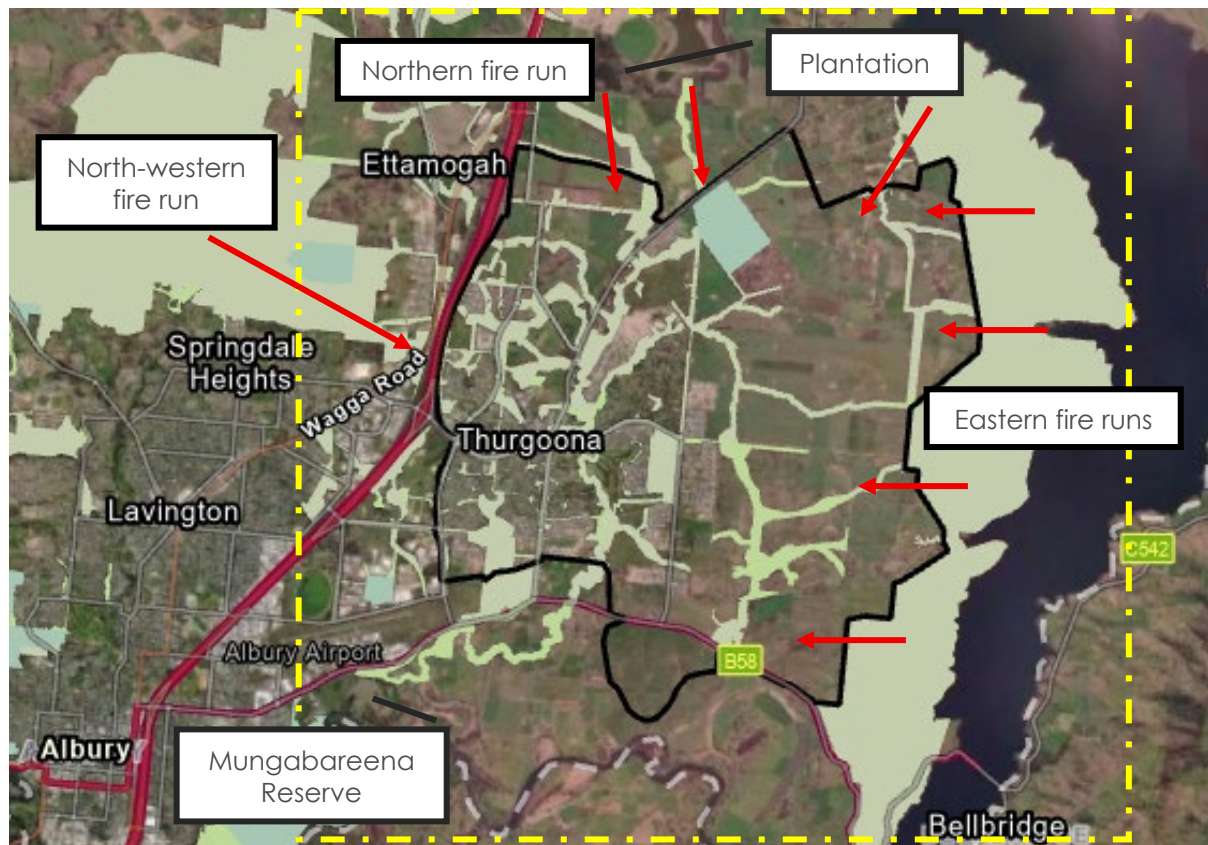


Figure 4-1: Conservation zoned land in the Structure Plan area and 2 kilometre assessment radius in yellow, key fire runs in red (Source: Albury City Council)

The following fuel loads, per the NSW Rural Fire Service 'Comprehensive Vegetation Fuel Loads' fact sheet dated March 2019, are identified as relevant the Structure Plan area:

Table 4-3: Fuel loads within and surrounding the Structure Plan area to a distance of 2 kilometres

Formation	Vegetation classification	Surface + Elevated Fuel Load (t/ha)	Overall Fuel Load (incl. bark and canopy) (t/ha)
Grassland	Riverine Plain Grasslands	6.0	6.0
Box gum	Upper Riverina DSF	14.0	25.09
Open Forest			
Grassy Box Gum Woodland			
Pine plantation	Pine plantation	21.0	31.0

It is noted the 2025 Structure Plan seeks to re-establish natural vegetation corridors and patches within the Structure Plan area which are not currently reflected by the Bush Fire Prone Land Map. As these corridors and patches will mature into hazard over time, it is appropriate they be considered in the next iteration of Bush Fire Prone Land mapping such that new development has regard to what will eventually become hazard into the future.

RECOMMENDATION: Ensure new patches and corridors of hazard that will be established as part of the Structure Plan are considered as part of the next iteration of Bush Fire Prone Land Mapping undertaken in partnership with the NSW RFS, to ensure future hazard is captured to

enable development to anticipate and respond at an early phase, thereby enhancing long-term resilience (it is noted that some corridors and patches may not meet the mapping criteria, or detailed landscape concept design avoids these from becoming hazardous). This should occur at a time that coincides with updates to the Albury LEP as a result of the Structure Plan.

The vegetation communities identified remain consistent beyond the boundary of the Structure Plan area. To the immediate east between the Structure Plan area and the Murray River, the land is predominantly used for grazing purposes with isolated tree specimens but also vegetated waterway tributaries. The river is 1.5 to 2km from the eastern extent of the Structure Plan area and is grassland dominated.

This is continued to the north and south of the Structure Plan area also. The Mungabareena Reserve on the Murray River is located south of Albury Airport and comprises both Category 1 and 2 vegetation. Whilst the reserve is largely separated from the Structure Plan area by the airport and industrial land, a minor fire run is present into the Structure Plan area from the south west, mostly by virtue of grassland. From the north, a plantation is located approximately 800m to the north around Ettamogah Forest Dam. Connectivity, both present and into the future between this area and Bells Travelling Stock Reserve within the Structure Plan area could see fire arrival from the north, as well as emanating from within the Structure Plan area itself.

The western portion of the Structure Plan area becomes more urbanised, and pockets and corridors of vegetation are more fragmented in nature. The western boundary of the Structure Plan area is largely defined by the Hume Highway, beyond this the landscape within 2km is largely urban with the exception of a key fire run from the north-west which narrows on approach to Wagga Road and the Hume Highway. Woodland fuels remain in situ, though occurring on rural residential properties. Management of the understorey increases in the area of Wagga Road. The Wagga Road, train line and Hume Highway transport corridor separates this north-western fire run from the Structure Plan area by a distance of approximately 260m. Corridors of dry sclerophyll forest are located in this area of the Structure Plan. The majority of this area has been previously developed, and further urban residential development is anticipated under both the 2013 Structure Plan as well as the 2025 Structure Plan. Trinity Anglican College is located in this area.

In summary, the bulk of landscape fuels present in and around the Structure Plan area (within a 2km radius) are dominated by grasslands. The treatment of grasslands will be important in terms of staging rational and temporary mitigations that may be required, which may also need to be contemplated in terms of their potential permanency should urban growth stall, slow or not continue for any reason. It cannot necessarily be assumed that future stages will be developed, or be developed in accordance with projected schedules, pending market forces.

Existing and future patches and corridors (at various scales) will be both retained and introduced throughout the Structure Plan area. These are considered by this Study, irrespective of whether they are currently mapped as BFPL or not. It is the case that they may be into the future, and thus are relevant in the context of this Strategic Study. These patches and corridors are generally synonymous with Upper Riverina dry sclerophyll forest and its fuel load adopted for all urban patches and corridors within and immediate surrounding the Structure Plan area.

A key fire run is present from the north west but is largely separated from the Structure Plan area by a 260m transportation corridor.

4.2.2 Topography

The slope of the land under classified vegetation has a direct influence on the rate of fire spread, its intensity, and level of radiant heat flux. The effective slope relates to the slope of the ground under the hazard (being the vegetation) and is generally based upon the steepest slope.

Effective slope is considered by this study at two scales, the first considering landscape terrain within 2 kilometres of the Structure Plan area, the second relating to land within the Structure Plan area itself. This is not limited to retained and new corridors and patches but includes all

areas given the potential for interim vegetation and grassland retention as a function of staging.

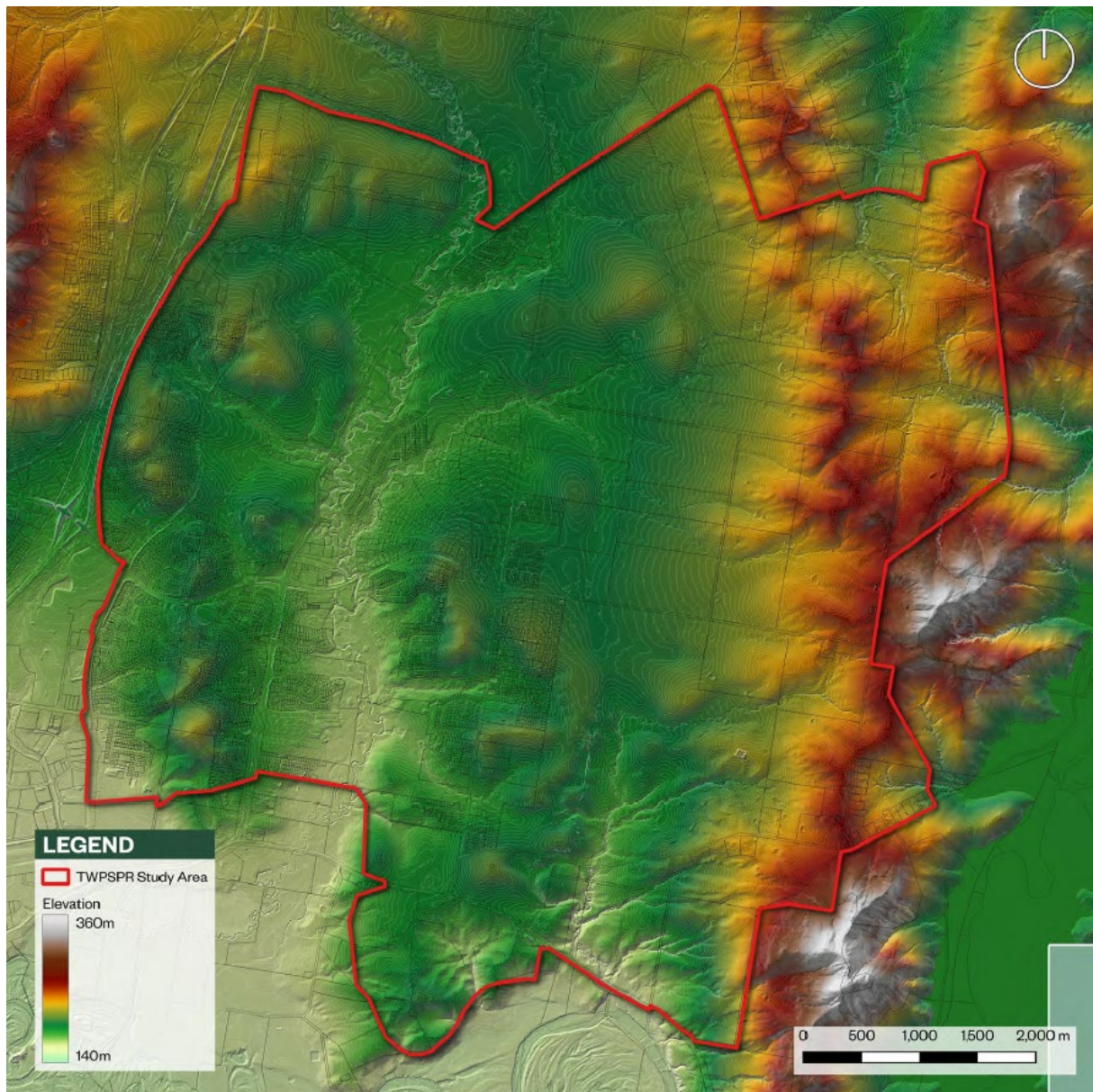


Figure 4-2: Landform of the Structure Plan area (Source: Albury City Council, 2025)

The Thurgoona Wirlinga Precinct is characterised by relatively flat terrain, with elevations generally below 220 metres above sea level (AHD). The central parts of the study area are mostly level, creating an expansive, open landscape which is continued to the north beyond the boundary of the Structure Plan area. The precinct is bordered by prominent hills to the east and north-west. The topography of hills rise towards 350 metres AHD on the eastern side. Land to the south is low-lying, rising up toward the Structure Plan area.

Areas with steeper slopes, particularly those exceeding 6 degrees, are primarily located along the eastern and southern hills and riparian corridors.

Despite the above contours, the steepness of slopes are relatively limited, at 12 degrees. Refer to Figure 4-3 below.

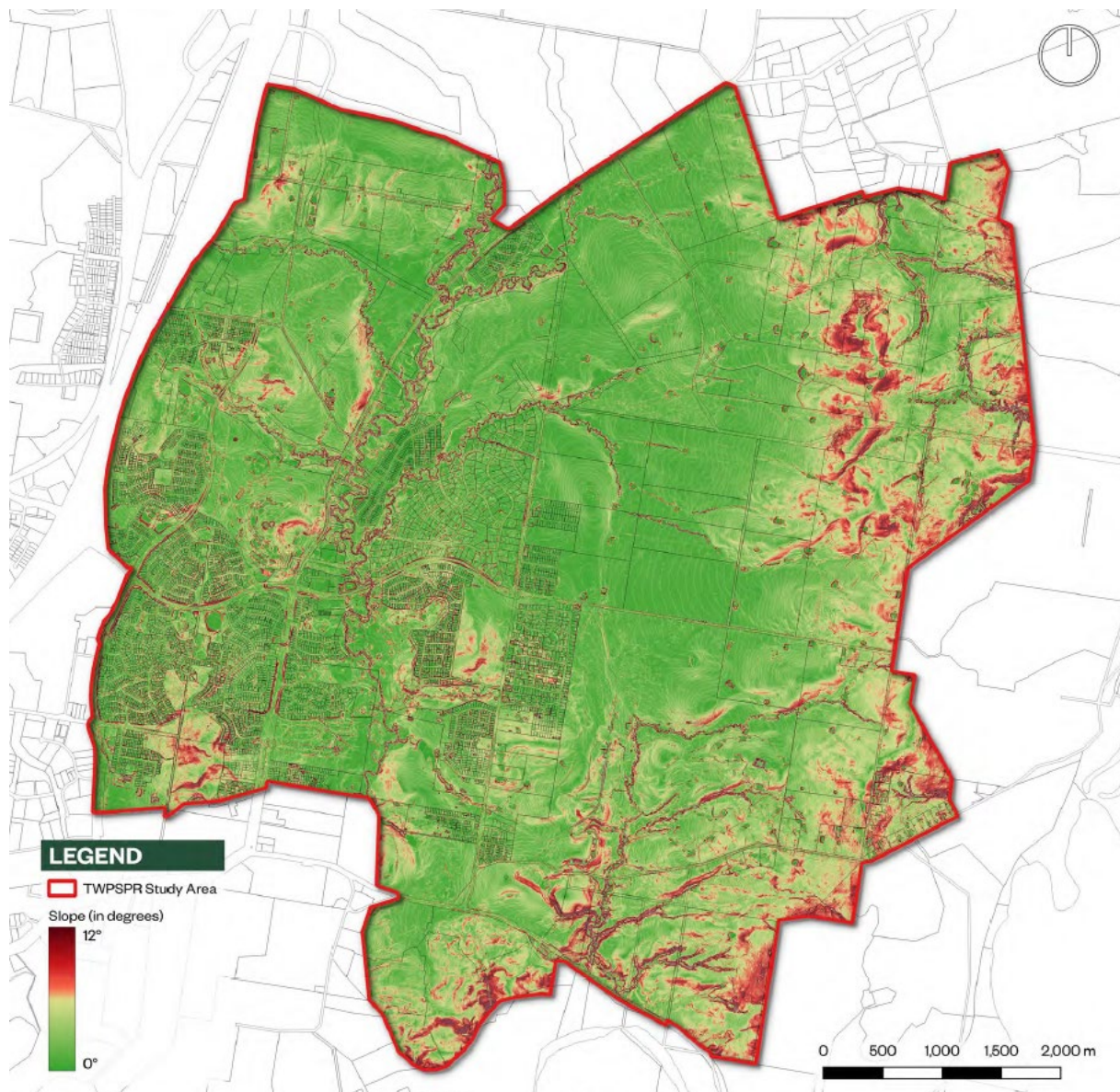


Figure 4-3: Slopes (in degrees) for the Structure Plan Area (Source: Albury City Council, 2025)

In summary, the majority of the Structure Plan area itself is relatively flat with hills to the east and north-west. From a fire run perspective, grassfire ignitions to the east of the Structure Plan area are likely to be subject to high rates of spread. Grassfires are fast moving and in this case, they will be aided by uphill runs into the Structure Plan area. Therefore, mitigation as development advances east across the Structure Plan area will be critical. Fire runs from the south and north are unlikely to be overly influenced by terrain, and more so by fire weather conditions. From the west, advancing fire will be travelling downhill toward the Hume Highway and Structure Plan area. Noting the 260m transport corridor in this location, bush fire attack in the form of ember attack and spotting within retained corridors may be possible depending on conditions.

In relation to patches and corridors within the Structure Plan area, some tributaries, corridors and patches incorporate steep banks or rapid changes in elevation but these are limited to 12 degrees which is relatively moderate in context and readily addressed by application of site assessment processes contained within PBP 2019. The strategic APZs identified by this BFSS highlight locations where bush fire prone measures (BMPs) prescribed by PBP would apply, such as perimeter roads, noting location and extent (or applicability) of APZs and other BMPs at development assessment stage may be designed based on more specific site-based and design measures than is available at strategic planning stage. Refer to **Appendix B** for strategic precinct-wide APZs.

4.2.3 Fire weather and local climate

Albury has a warm, temperate, four-season climate, with cool to mild winters and very warm to hot summers. In summer, the mean daily maximum temperature is 30 C with low humidity however, this is subject to substantial daily variation⁴. An average of 17 days with a maximum above 35 C occurs in this summer period. Mean winter maximums are 14 C with many crisp, sunny days. Frosts are commonplace in winter, with approximately 20 days per year featuring minimums of below freezing⁵.

Albury's mean annual rainfall is 701.3 millimetres, which is more than Melbourne but less than Sydney. Rain can occur all year round, but most of it falls in the winter months with July's high mean of 82.3mm comparing with the March low of 37.9mm. Albury has a high evaporation rate, giving the environment a more arid look compared to drier cities like Melbourne⁶.

During the summer, dry storms producing lightning frequently occur. Winters tend to experience higher rainfall and lower temperatures⁷.

The Albury City LGA forms part of the Eastern Riverina fire weather region for which PBP 2019 prescribes a Forest Fire Danger Index (FFDI) of 80. The FFDI measures the degree of fire danger for Australian vegetation relative to prevailing weather and climatic conditions which vary across days and seasons. The new Australian Fire Danger Rating System (AFDRS) transitions the measurement of fire weather to the Fire Behaviour Index (FBI). At this stage, PBP 2019 continues to measure fire weather using the FFDI. However, over time this is likely to transition.

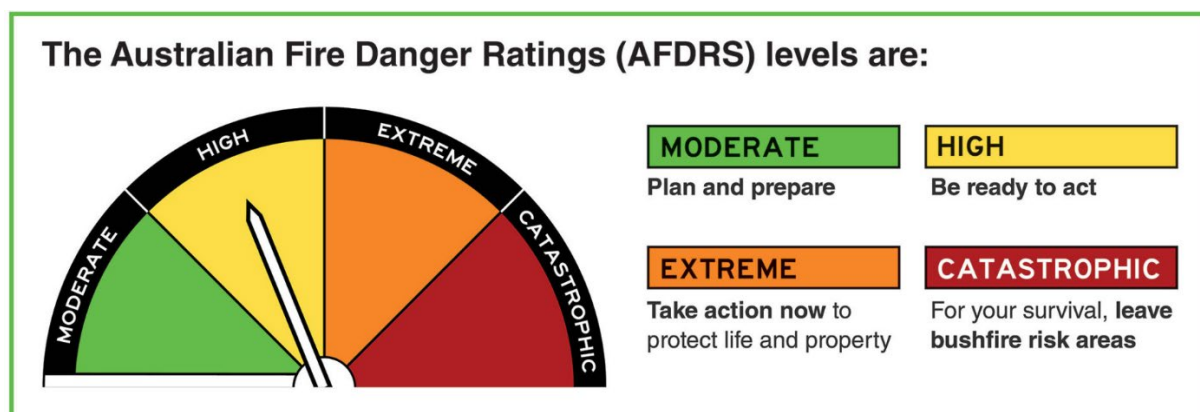


Figure 4-4: The Australian Fire Danger Rating System (Source: AFAC)

Pursuant to PBP 2019, the 1:50 year fire weather scenario (based on annual return interval, or an annual exceedance probability of two per cent) is adopted for the purposes of informing land use planning approaches. This reflects the same approach adopted by Australian Standard AS3959-2018 – Construction of buildings in bush fire prone areas.

As part of this report, data on wind speed and direction, rainfall and humidity data has been gathered from the Bureau of Meteorology website from the Albury Airport Automatic Weather Station (072160) as the closest weather station. This station commenced data collection from 1993. Another weather station at the airport collected data prior to this time.

The 2019-20 fire weather season was record-breaking for NSW, during which 34,283 hectares of land within the Southern Border region was burnt⁸.

⁴ Ibid.

⁵ Ibid.

⁶ Ibid.

⁷ Hume BFRMP, NSW Rural Fire Service, Available online at <https://www.rfs.nsw.gov.au/plan-and-prepare/know-your-risk/bush-fire-risk-management-plans>

⁸ Southern Border BFM, NSW Rural Fire Service, Available online at <https://www.rfs.nsw.gov.au/plan-and-prepare/managing-bush-fire-risk/bush-fire-management-committees/southern-border>

In 2020 the Bureau of Meteorology issued a Special Climate Statement detailing the climatic factors which contributed to dangerous fire weather conditions in the 2019-20 fire season, confirming large areas of Australia had their highest accumulated FFDI for December in 2019. It also notes 2019 had the highest December accumulated FFDI for Australia as a whole, continuing the pattern seen in the spring period across NSW⁹.

From a climate perspective, the 2024 Riverina Murray Climate Change Snapshot data¹⁰ which is based on NSW and ACT Regional Climate Modelling (NARClIM 2.0), includes two Shared Socio-Economic Pathways (SSPs) (SSP1-2.6 [low] and SSP3-7.0 [high] which reflect low and high spectrums of potential futures based on global emissions policy / reduction and provide the following:

- Average temperatures increase under both SSP scenarios to 2050 and to 2090;
- The number of hot days (equal to or above 35 degrees) increases under both SSP scenarios to 2050 and to 2090;
- The number of hot days will increase and the number of cold nights will decrease across both SSP scenarios to 2050 and to 2090;
- Rainfall is projected to remain variable under each SSP scenario but overall, is projected to decrease by 2090; and
- Severe fire weather days are projected to increase across both SSP scenarios to 2050 and to 2090, demonstrating an increase in fire weather frequency for the region.

On the basis of the above and noting the current planning and building threshold for this region at FFDI 80, an additional proxy¹¹ climate change scenario of FFDI 100 is incorporated to consider the effects of climate change on fire behaviour calculator outputs to inform strategic decision-making.

4.2.3.1 Wind speed and direction

Monthly climate statistics from BoM's 'Climate Data Online' provide wind information for the region from the Albury Airport AWS from 1993 as the closest automatic weather station to the Structure Plan area, noting long-term average statistical climate and weather data from the BoM was unavailable at the time of writing.

Monthly BoM statistics for the 3pm observations (around the time where FFDI peaks each day which is typically between 3pm and 5pm) have been considered for each month of the fire season from August to March, and then annually. Observations of early fire season conditions in September, October, November and December indicated that the prevailing wind direction is from the west.

⁹ Special Climate Statement 73, Bureau of Meteorology, Available online at <https://www.bom.gov.au/climate/current/statements/scs73.pdf>

¹⁰ Riverina Murray Climate Change Snapshot, DCCEEW, 2024, Available online at <https://www.climatechange.environment.nsw.gov.au/sites/default/files/2024-08/NARClIM2-Snapshot-RiverinaMurray.pdf>

¹¹ A proxy is used for the purposes of this Study in the absence of FFDI or FBI-aligned climate change variable fire weather data.

Rose of Wind direction versus Wind speed in km/h (05 May 1993 to 10 Aug 2025)

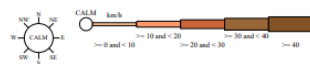
Custom times selected, refer to attached note for details

ALBURY AIRPORT AWS

Site No: 072160 • Opened Apr 1960 • Still Open • Latitude: -36.0662° • Longitude: 146.953° • Elevation 163 m

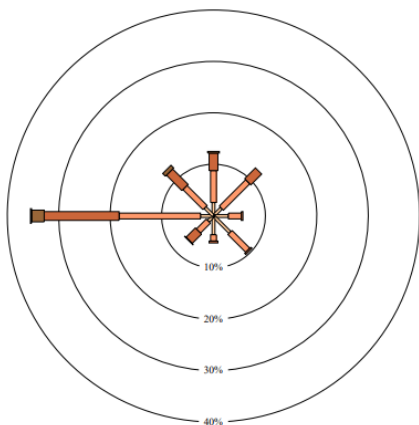
An asterisk (*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.



3 pm Sep
946 Total Observations

Calm *



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TC2MONTH Page 1

September observations
(measured from May 1993 to Aug 2025)

Rose of Wind direction versus Wind speed in km/h (05 May 1993 to 10 Aug 2025)

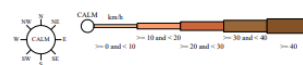
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ALBURY AIRPORT AWS

Site No: 072160 • Opened Apr 1960 • Still Open • Latitude: -36.0662° • Longitude: 146.953° • Elevation 163 m

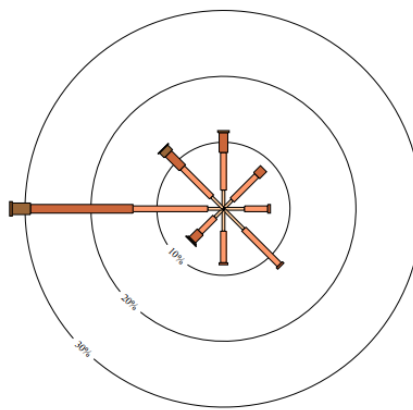
An asterisk (*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.



3 pm Oct
965 Total Observations

Calm *

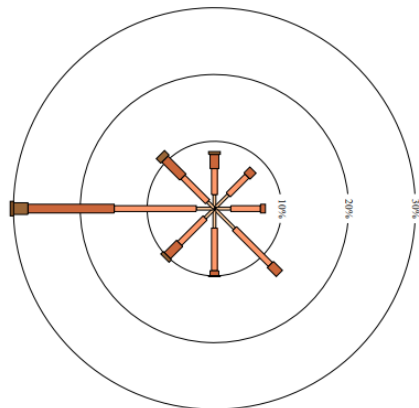
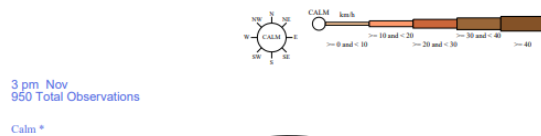


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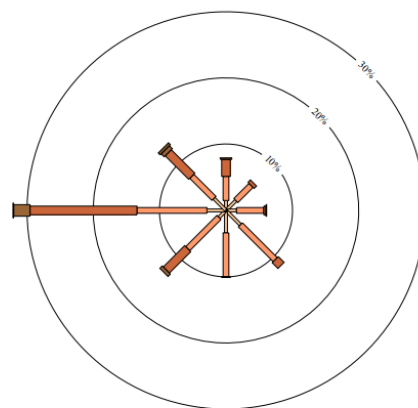
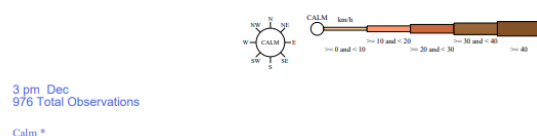
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October observations
(measured from May 1993 to Aug 2025)

Rose of Wind direction versus Wind speed in km/h (05 May 1993 to 10 Aug 2025)
Custom times selected, refer to attached notes for details.
ALBURY AIRPORT AWS
Site No: 072160 • Closed Apr 1993 • Still Open • Latitude: -36.0662° • Longitude: 146.953° • Elevation 163 m
An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



Rose of Wind direction versus Wind speed in km/h (05 May 1993 to 10 Aug 2025)
Custom times selected, refer to attached notes for details.
ALBURY AIRPORT AWS
Site No: 072160 • Closed Apr 1993 • Still Open • Latitude: -36.0662° • Longitude: 146.953° • Elevation 163 m
An asterisk (*) indicates that calm is less than 0.5%.
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November observations
(measured from May 1993 to Aug 2025)

December observations
(measured from May 1993 to Aug 2025)

4.2.3.2 Rainfall

Mean rainfall data is available via the BoM's 'Climate Data Online' facility, with data sourced from the Albury Airport AWS from 1993 (see **Figure 4-5**).

The highest mean rainfall months each year are typically November, June, July and August where the rainfall can reach up to 70mm each month. Winter rainfall is therefore more commonplace than summer rainfall. Average annual rainfall is approximately 641.5mm. Rainfall is lowest between February and April, conducive to mid to late season fire activity. The months of December to April represent a period of increased bush fire hazard, with lower soil and biomass moisture contents from the drier / frosty winter period combining with rising daytime temperatures which increases the bush fire risk.

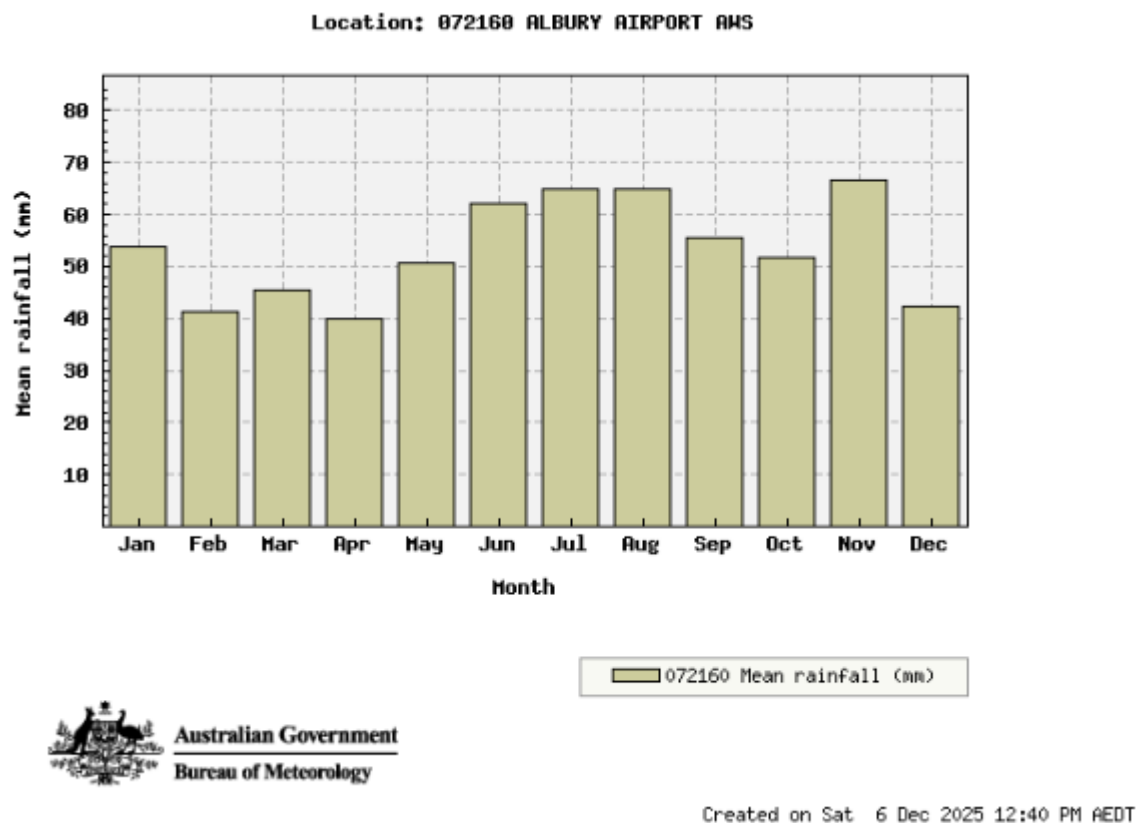


Figure 4-5: Mean rainfall for Albury Airport AWS (Source: BoM)

4.2.4 Fire history, key fire runs and fire behaviour

Fire history data for the vicinity of Thurgoona Wirlinga has been obtained from the Southern Border team at NSW Rural Fire Service. Overall, for the reporting period from 2005 to 2025, 189 incidents were responded to either by NSW Rural Fire Service or Fire and Rescue NSW. A total of 154.23ha of land were affect during this period. Most events were grassfires (only 31 were classes as bush fire or scrub fires), with only three (3) events that exceeded 10ha, all of which were grassfires. Of these three events, two occurred in 2008 and one in 2019.

As per the above, detail, fire is active in the and surrounding the Structure Plan area based on this fire history.

Key fire runs relative to the Structure Plan area exist from the east, including fast-moving grassfires that run up the hills that define the eastern boundary. A major fire run is also present from the north west. Key defining factors are that this fire run is separated from the Structure Plan area by a 260m transport corridor, but also that fire would run down from higher elevation, which my slow the rate of spread and also see an easing of fire behaviour, depending on conditions. However, ember attack is possible, even despite the distance, due to this change in elevation.

From the south, vegetation in and around the Murray River is largely separated from the Structure Plan area by the airport and industrial land, however a minor fire run is present into the Structure Plan area from the south west, mostly by virtue of grassland.

From the north, a plantation is located approximately 800m to the north around Ettamogah Forest Dam. Connectivity, both present and into the future between this area and Bells Travelling Stock Reserve within the Structure Plan area could see fire arrival from the north, as well as emanating from within the Structure Plan area itself.

Fire runs relevant to the Structure Plan area from the surrounding landscape are featured in Figure 4-1 of this report.

4.2.4.1 Fire behaviour calculations

Fire behaviour both within and arriving from outside the Structure Plan area is modelled using a small number of strategic scenarios, used in order to understand and assess the relative scale of landscape-scale hazard and risk.

At the site-specific scale for corridors and narrow patches within the Structure Plan area, flame width may be reduced via use of the Short Fire Run methodology (given the constrained opportunity to reach maximum rate of spread on such environments) but this is not applied at the strategic scale and is not used to justify any strategic planning decisions or directions within the Structure Plan area, given it is a performance -based solution.

Table 4-4: Fire behaviour calculation scenario inputs

Modelling input		FFDI 80 Scenario	FFDI 100 Scenario (climate change proxy)
Fire weather	FFDI	80	100
	GFDI	110	130
Fuel load	Grassland	6.0 t/ha	
	Upper Riverina DSF	Understorey 14.0 t/ha Total 25.09 t/ha	
Slope	Average	6 degrees	
	Maximum	12 degrees	
	Site slope	3 degrees	
Flame temperature	SFPPs	1,200K	
	Other development	1,090K	

The Fire Protection Association of Australia (FPAA) FLAMESOL calculator was used to model each of the above scenarios, with the calculator outputs included at **Appendix A**.

Grassfire

The grassfire behaviour context relevant to the Structure Plan area, as evidenced in the tables that follow, is characterised by high rates of spread. The residency period of flame is lower and as such, separation distances are reduced. Maximum separation distance for grassfire hazard is 50m before it is no longer deemed a hazard that requires a planning or building intervention / mitigation. This is important to note from a staging perspective, and how housing affordability can be considered through appropriate early consideration of staging and urban design.

Table 4-5 contemplates current planning and building thresholds whereas Table 4-6 considers potential climate change effects on fire behaviour. Where the climate change separation distances can be achieved by the Structure Plan, this is encouraged given the duration of likely development within Thurgoona Wirlinga, the potential impacts of climate change and also the potential for changes to bush fire protection policy regarding climate change into the future. This will assist the Structure Plan area to have regard to climate change (regulatory) transition risk at an early stage.

These indicators and separation thresholds are considered further in Section 4.3 of this report – Land Use Assessment.

Table 4-5: Grassland fire behaviour indicators at GFDI 110 (current PBP planning threshold)

Fire behaviour indicator		Scenario 1 – Grassland at average slope non-SFPP	Scenario 2 – Grassland at max slope non-SFPP	Scenario 3 – Grassland at average slope for SFPPs	Scenario 4 – Grassland at max slope for SFPPs
Rate of spread		21.63km/hr 6.0m/s	32.72km/hr 9.08m/s	21.63km/hr 6.0m/s	32.75km/hr 9.09m/s
Flame length		9.76m	12.0m	9.76m	12.0m
Fire intensity		67,064kW/m	101,459kW/m	67,064kW/m	101,459kW/m
Radiant heat threshold – minimum distance	10kW/m ²	28.3m	33.5m	38.6m	44.9m
	12.5kW/m ²	23.5m	28.0m	N/A	N/A
	19kW/m ²	16.1m	19.5m	N/A	N/A
	29kW/m ²	10.8m	13.2m	N/A	N/A

Table 4-6: Grassland fire behaviour indicators at GFDI 130 (climate change proxy)

Fire behaviour indicator		Scenario 1 – Grassland at average slope non-SFPP	Scenario 2 – Grassland at max slope non-SFPP	Scenario 3 – Grassland at average slope for SFPPs	Scenario 4 – Grassland at max slope for SFPPs
Rate of spread		25.56km/hr 7.1m/s	38.67km/hr 10.74m/s	25.56km/hr 7.1m/s	38.67km/hr 10.74m/s
Flame length		10.61m	13.05m	10.61m	13.05m
Fire intensity		79,258kW/m	119,906kW/m	79,258kW/m	119,906kW/m
Radiant heat threshold – minimum distance	10kW/m ²	30.3m	35.7m	41.1m	47.6m
	12.5kW/m ²	25.2m	30.0m	N/A	N/A
	19kW/m ²	17.4m	21.0m	N/A	N/A
	29kW/m ²	11.7m	14.3m	N/A	N/A

Bush fire

The bush fire behaviour context relevant to the Structure Plan area, as evidenced in the tables that follow, is characterised by moderate rates of spread but elevated flame length longer flame residency periods. As for grassfire hazard, it remains important that development staging and bush fire resilient urban design is considered early.

Table 4-7 contemplates current planning and building thresholds whereas Table 4-8 considers potential climate change effects on bush fire behaviour. Where the climate change separation distances can be achieved by the Structure Plan, this is encouraged given the duration of likely development within Thurgoona Wirlinga, the potential impacts of climate change and also the potential for changes to bush fire protection policy regarding climate change into the future. This will assist the Structure Plan are to have regard to climate change (regulatory) transition risk at an early stage.

These indicators and separation thresholds are considered further in Section 4.3 of this report – Land Use Assessment.

Table 4-7: Bush fire behaviour indicators at FFDI 80 (current planning threshold)

Fire behaviour indicator		Scenario 1 – DSF at average slope non-SFPP	Scenario 2 – DSF at max slope non- SFPP	Scenario 3 – DSF at average slope for SFPPs	Scenario 4 – DSF at max slope for SFPPs
Rate of spread		2.03km/hr 0.56m/s	3.07km/hr 0.85m/s	2.03km/hr 0.56m/s	3.07km/hr 0.85m/s
Flame length		16.22m	23.1m	16.32m	23.1m
Fire intensity		26,357kW/m	41,162kW/m	27,208kW/m	41,162kW/m
Radiant heat threshold – minimum distance	10kW/m ²	42.0m	53.8m	55.4m	69.09m
	12.5kW/2	35.6m	46.4m	N/A	N/A
	19kW/m ²	25.5m	34.2m	N/A	N/A
	29kW/m ²	17.5m	24.2m	N/A	N/A

Table 4-8: Bush fire behaviour indicators at FFDI 100 (climate change proxy)

Fire behaviour indicator		Scenario 1 – DSF at average slope non-SFPP	Scenario 2 – DSF at max slope non- SFPP	Scenario 3 – DSF at average slope for SFPPs	Scenario 4 – DSF at max slope for SFPPs
Rate of spread		2.54km/hr 0.70m/s	3.84km/hr 1.06m/s	2.54km/hr 0.70m/s	3.84km/ 1.06m/s
Flame length		19.62m	28.1m	19.62m	28.1m
Fire intensity		34,010kW/m	51,453kW/m	34,010kW/m	51,453kW/m
	10kW/m ²	48.1m	61.3m	62.4m	77.8m

Radiant heat threshold – minimum distance	12.5kW/2	41.2m	53.2m	N/A	N/A
	19kW/m2	29.9m	39.9m	N/A	N/A
	29kW/m2	20.9m	28.8m	N/A	N/A

4.3 Land use assessment

The second aspect of a strategic bush fire study focuses on the assessment of the appropriateness of potential land uses, having regard to the assessment considerations outlined below.

Table 4-9: PBP 2019 strategic land use assessment requirements

Issue	Detail	Assessment considerations
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	- The risk profile of different areas of the development layout based on the above landscape study; - The proposed land use zones and permitted uses; - The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site); and - The impact of the siting of these uses on APZ provision.

The above assessment considerations are addressed as follows, divided across the following:

- Consideration of developed areas
- Zoning (including centres and SFPPs)
- Staging.

Noting that the 2025 Structure Plan is focused on changes since the 2013 Structure Plan was introduced, this assessment focuses on these changes and has regard to the Structure Plan area more broadly, where relevant from a bush fire and grassfire hazard and risk perspective.

Refer to Figures 2-1 and 2-2 of this Study for the 2013 and the 2015 Structure Plans.

It should also be noted that, over staging (addressed at Section 4.3.3), mapped bush fire hazard will be cleared and interim APZs should be established for each stage. The APZ maps included at **Appendix B** are based on the ultimate Structure Plan intent, acknowledging where potential bush fire hazard may be retained or generated (through rehabilitated vegetated corridors) within the Precinct.

As a recap, the key changes from the 2013 Structure Plan to the 2025 Structure Plan are:

- Revised locations for shops and centres (Major Neighbourhood Centres and Village Centres), sportsgrounds, parks, some roads and schools.
- More defined areas of medium-density residential areas around centres
- More defined transition from urban residential areas to low-density and large lot residential areas on the eastern and southern precinct boundaries
- Adjusted land uses in key areas of biodiversity value (such as land uses near Bells Travelling Stock Reserve)
- Inclusion of drainage basin locations (as per the 2020 Drainage Strategy)
- Introduces a pocket of urban services land use (E3 Productivity Support zone) at the northern boundary of the Defence landholding

- Revises the proposed staging map to assist in an orderly and coordinated approach to development and align with the Water and Wastewater Master Plans
- Increased focus on implementation with an Action Plan outlining next steps such as completing land rezoning processes, planning amendments, additional studies.

4.3.1 Developed areas

Pursuant to the long-term strategic planning that has guided the growth of the Thurgoona Wirlinga Structure Plan area, core parts of its have been previously developed subject to historical development applications.

The 2025 Structure Plan focuses on the areas where change is most likely, while also integrating existing development and identifying areas for enhancement. The Defence land within the area is set to remain, with the Commonwealth Government advising it has no current plans to divest its landholding in the near future.

The green and blue networks identified by the 2025 Structure Plan refers to the network of open spaces which includes parks, sports grounds, tree canopy, bushland and creeks that extend through the Thurgoona Wirlinga precinct.

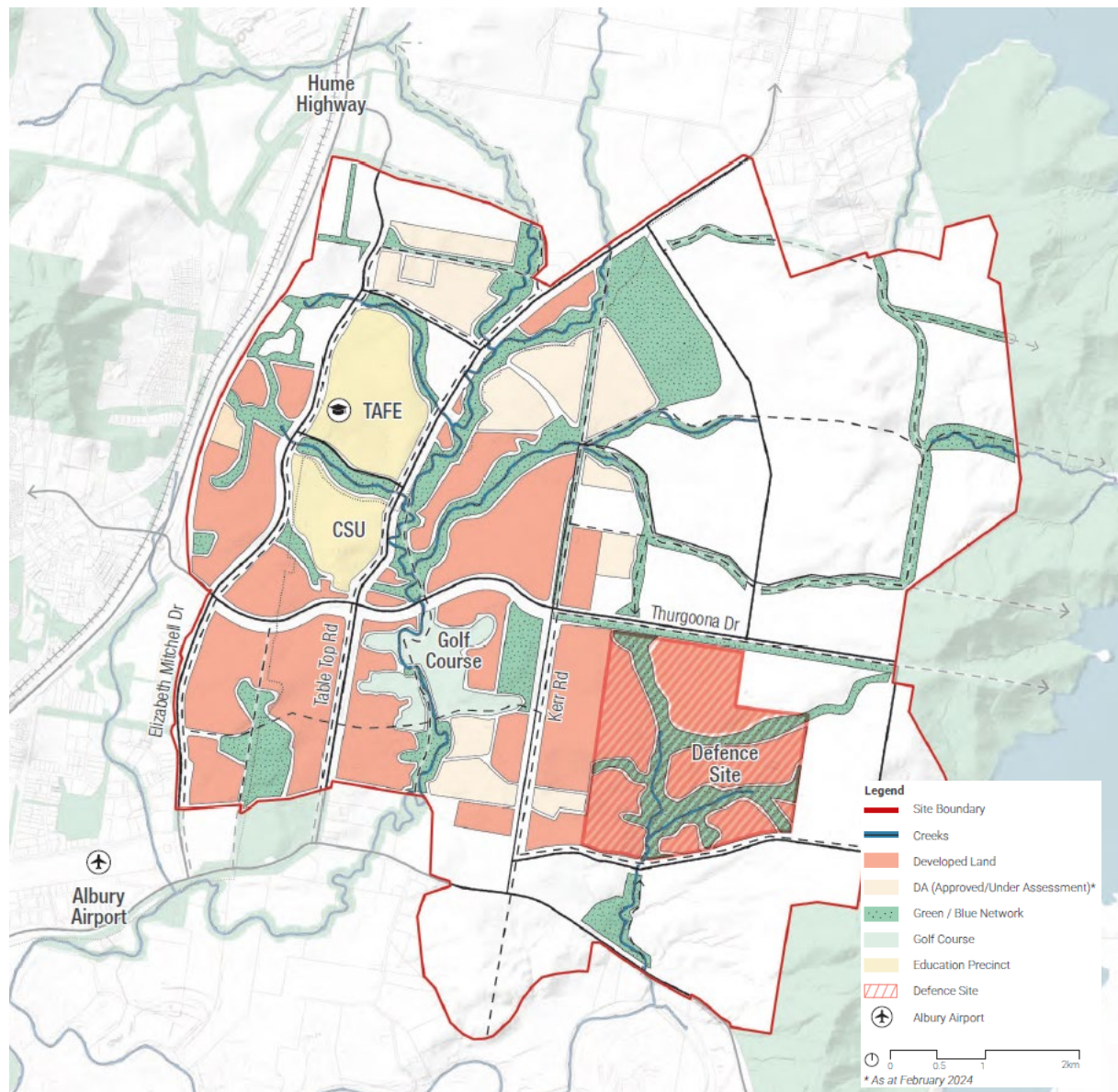


Figure 4-6: Map of developed lands within the Structure Plan area (Source: Albury City Council, 2024)

These developed areas therefore do not form a key focus for this Bush Fire Strategic Study, noting their previous approval history. It is the areas in which and the green networks that transect them that form the focus of this Study, and these areas are divided into **four (4) focus areas as part of the following zoning assessment.**

4.3.2 Zoning (including centres and SFPPs)

This section has regard to the proposed change of zoning (previously specified at Section 2.1.1 of this report) across the four (4) undeveloped areas of Thurgoona Wirlinga from the 2013 Structure Plan. Broadly, the 2025 Structure Plan is more detailed and values from the benefit of more extensive consideration of environmental values and other technical matters to appropriately manage undeveloped areas in a finer level of detail, compared to the 2013 Structure Plan. Therefore, it represents an evolution of planning intent for these areas, rather than a revolution. The overarching intent for urban growth has not changed, nor have development objectives for the Structure Plan area that were established in 2013. This is relevant detail in terms of NSW RFS' consideration of the proposed changes to the Structure Plan from the 2013 version.

The four focus areas comprise the:

- Southern extent
- Central extent
- North-eastern extent
- North-western extent.

A key to the focus area location is displayed at the top right of each map in the sections that follow.

4.3.2.1 Southern extent

Having regard to the 2013 Structure Plan at Figure 2-1 of this Study, the 2025 iteration represents a refinement of the intent established in 2013. The District Parkland in the south is expanded with a band of Low density residential zoned land remaining along the southern-most boundary extent of the Structure Plan area. In 2013, it was intended the density of this zone would be a minimum of 2,500sqm and this remains unchanged. Grassfire hazard is the primary form of hazard in this location.

The major neighbourhood centre and surrounding residential development is more refined in its location and extent, neither of these zones are within proximity to potential bush fire hazard. A community centre is proposed in this location, and in the contexts of its separation from bushfire hazard and broader centre function, this remains a reasonable location for such a use. A school is intended to the north-east of the centre and to the south of the Defence site. The school is proposed to be bound by two roads. Vegetation within proximity to this location is limited to grasslands.

Stormwater conveyance and detention has changed as a result of more detailed studies and design work undertaken to inform the 2025 Structure Plan. In the east, the intent for very low density residential persists, changing from Rural residential to Large lot residential. It is not considered that this represents a significant departure from that which was identified as the intent for this area in the 2013 Structure Plan.

A road reserve is intended to separate General residential activities from the existing Defence Land which is appropriate, noting the potential ignition source of the activities conducted on the Defence site.

Key green corridor linkages from the Defence site to the south is retained. This corridor linkage is likely to remain classed as BFPL because of its orientation and connection with broader areas of classified hazard to the south. It is largely intended to be adjoined by detention basins and

parkland. General residential development which interfaces with this corridor will need to comply with the provisions of PBP 2019.

RECOMMENDATION: The revegetation of proposed corridors within the Precinct is undertaken in a manner that has regard to the generation of potential bush fire hazard. Opportunities to break the fuel connectivity of corridors either by infrastructure (such as roads) or via fire-wise planting areas is balanced alongside the environmental aspirations for the corridor network.

Assessment: This study does not observe any particular risk issues that would otherwise be unable to be addressed by bush fire protection measures (BPMs) implemented via assessment of PBP 2019 at development assessment phase. Strategic-level APZs are provided at **Appendix B** which demonstrate that further development is capable of accommodating the APZ requirements of PBP 2019.

The land use mix continues to remain appropriate relative to the potential grassfire hazard exposure within this southern extent of the Structure Plan area. Ideally, any SFPP activities such as aged care should avoid being located within 150m of land that is likely to remain mapped as BFPL. Interim measures to separate all uses from hazard exposure must be considered. Refer to the separate staging section below.

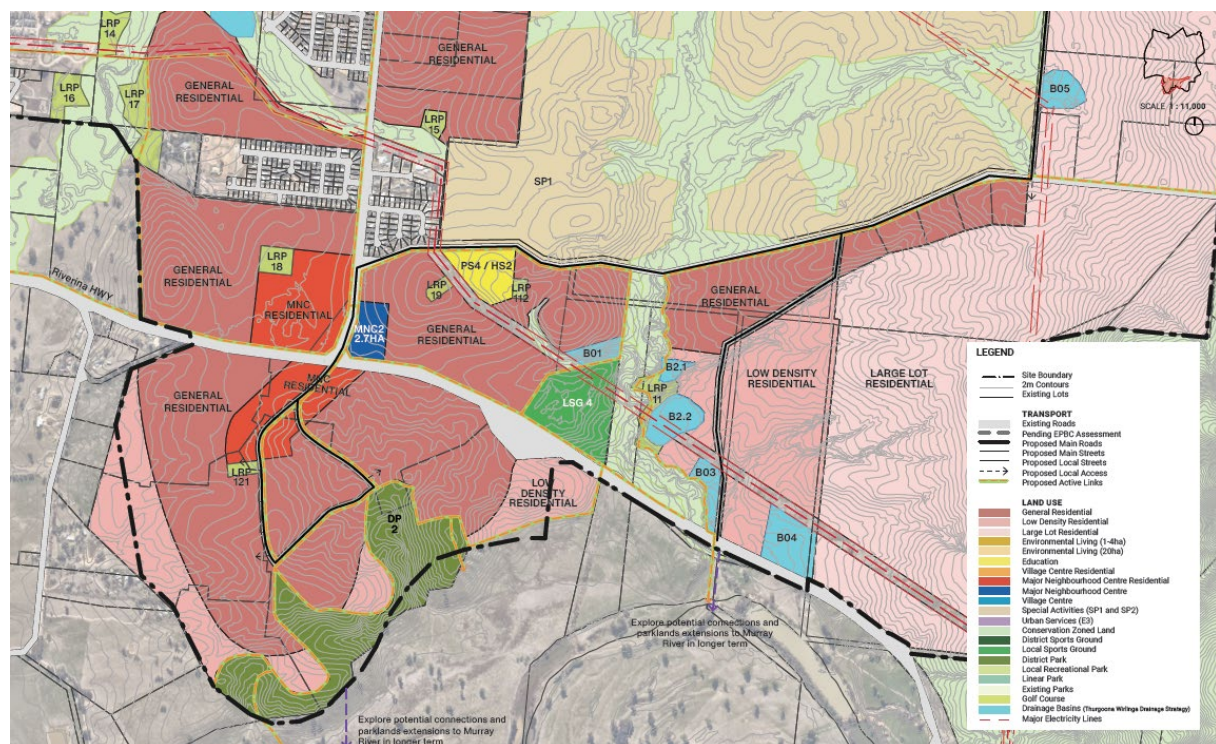


Figure 4-7: Southern extent zoning approach under the 2025 Structure Plan (Source: Albury City Council, 2025)

4.3.2.2 Central extent

This area is located to the north of the Defence site. The location of the proposed centre has shifted further south compared with its location identified under the 2013 Structure Plan. Two schools remain proposed but relocated slightly. The western school site has shifted from being located further to the north east to the located mapped at Figure 4-8 below, whilst the southern school site has been relocated further north. A community centre is proposed near the proposed district park, adjacent to the centre.

The transition in zone density of residential development from east to west is maintained but is now more specific in terms of its location and extent. Larger residential allotments along the eastern extent of Structure Plan area is consistent with the 2013 approach, noting the topography of this area. This zoning rationale remains appropriate from a fire exposure

perspective also, limiting density and therefore exposure, but enabling a lot size which is conducive to maintaining asset protection.

The proposed road network structure is fairly aligned to a grid-style pattern, enabling multiple route options away from potential grassfire hazard to the east, and enabling emergency access and egress as required.

Linear parkland and green network corridors remain proposed, following key drainage lines and areas of increased biodiversity value, including for fauna connectivity. Key north-south and east-west corridors intersect in this area of Thurgoona Wirlinga. Both of these are oriented to carry fire from fire runs to the east and from the south. Therefore, their relevance cannot be discounted. It is noted that future detailed design of the corridors may alter the assessment made by this Study, in that fuel connectivity may be broken and at certain points, it could be demonstrated that the corridors cease to be hazardous and more of a maintained fuel class however this information is not available at the time of writing.

The linear parkland flanking these corridors, which would form part of Council's asset management responsibilities may contribute toward asset protection. Local road network design should enhance this separation with perimeter roads along these corridors.

Assessment: This study does not observe any particular risk issues that would otherwise be unable to be addressed by bush fire protection measures (BPMs) implemented via assessment of PBP 2019 at development assessment phase. Strategic-level APZs are provided at **Appendix B** which demonstrate that further development is capable of accommodating the APZ requirements of PBP 2019.

The land use mix continues to remain appropriate relative to the potential grassfire hazard exposure within this central extent of the Structure Plan area. Ideally, any SFPP activities such as aged care should avoid being located within 150m of land that is likely to remain mapped at BFPL. Interim measures to separate all uses from hazard exposure must be considered. Refer to the separate staging section below.

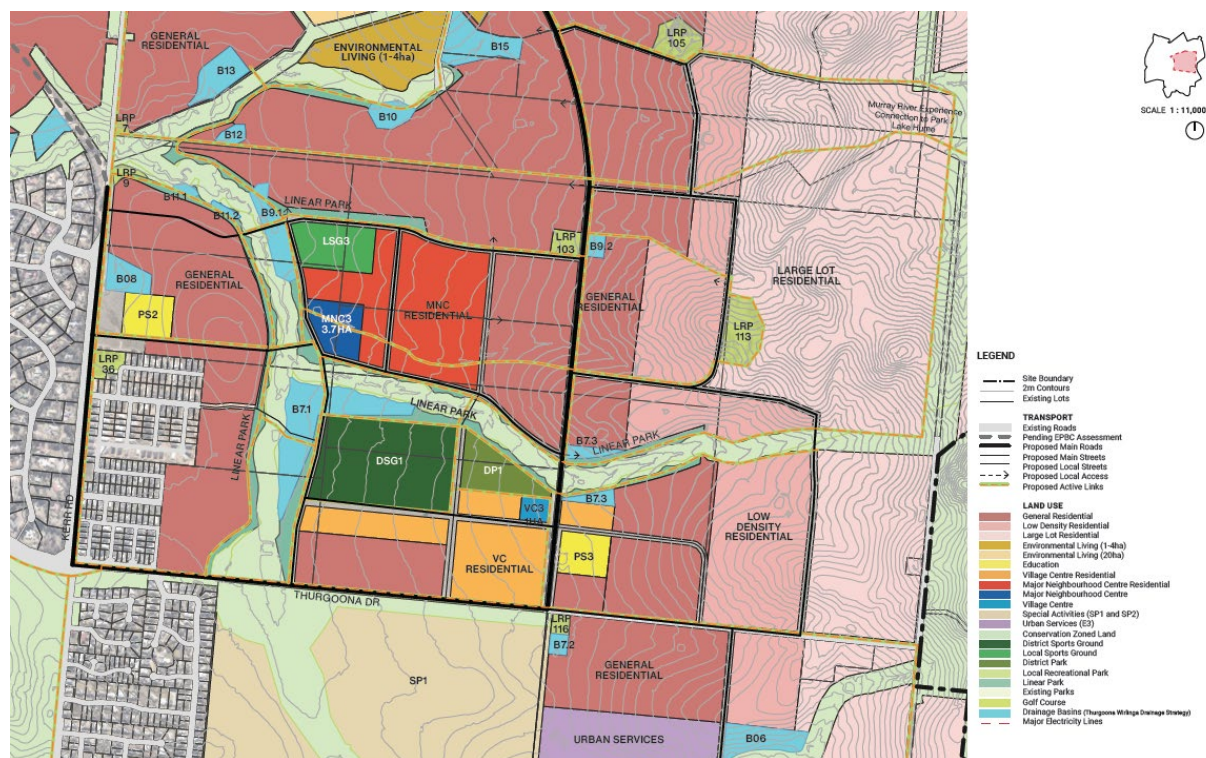


Figure 4-8: Central extent zoning approach under the 2025 Structure Plan (Source: Albury City Council, 2025)

4.3.2.3 North-eastern extent

One of the key characteristics of this part of the Structure Plan area is Bells Travelling Stock Reserve, which is the area in green per Figure 4-9 below. This reserve measures almost 90 hectares and is adjoined to the south by woodlands which, under the 2025 Structure Plan, is intended for Environmental living. Under the 2013 Structure Plan, the southern boundary of the reserve was instead defined by a sport grounds, parkland and village residential.

It is noted from aerial imagery that an existing residential dwelling is located on the 20ha Environmental living area identified by the 2025 Structure Plan. The 20ha Environmental living zone area measures approximately 150 hectares, enabling potentially 7-8 allotments. A further Environmental living area of lots between 1-4 hectares is also proposed.

The Bells Travelling Stock Reserve connects with vegetation to the north which goes on to connect with forestry / plantation land about 800m to the north. The corridor from the north is separated from Bells Travelling Stock Reserve by Table Top Road which has a road reserve width of approximately 45m.

This location, and the General residential interface with Bells Travelling Stock Reserve is one of the higher risk locations within the Structure Plan area. The 2013 Structure Plan identified an interface of the General residential with this reserve, and whilst this remains unchanged this interface treatment requires consideration. A wide perimeter road is recommended to provide guaranteed separation in perpetuity from the reserve. Having regard to the separation distances examined at Section 4.2.4 of this Study, a structured approach which achieves a separation of no less and 20.9m is ideal, assuming exposure at 29kW/m. Greater separation distance will reduce the radiant heat exposure, and therefore construction requirements and cost, with greater separation built-in through urban design approaches.

With respect to the Environmental living zones, development will be intermixed with vegetation, part of which is likely to remain in situ post development, having regard to the intent of the zoning. Whilst the minimum lot sizes are large, which limits the amount of growth, subdivision design should have regard to the requirements of PBP 2019 at an early stage to ensure its development is undertaken in a resilient manner. Detailed structure planning at subdivision stage for this location is necessary in order to mitigate the risk of bush fire attack relating to any development within these zones.

The centre in this area has slightly shifted but is in the same general location identified in 2013. A community centre is identified at the centre, which will be located adjacent to the prominent bush fire prone environment. The centre therefore may not be able to be used by the public during bush fire events. It is intended to be separated from Bells Travelling Stock Reserve by a main road, being Kywanna Road. It will be updated and widened to support growth.

Special Fire Protection Purposes including schools and aged care should avoid being located within 150m of Bells Travelling Stock Reserve. The proposed location of the new school adjoining the proposed centre in this area is likely to achieve this and appears to be separated by approximately 200m or more.

To the east, Large lot residential is proposed, is a similar format that reflects the 2013 Structure Plan in terms of its intent for transition from larger allotment residential to General residential from east to west, having regard to topography on the east. This also represents a practical approach to grassfire mitigation, from a strategic planning perspective.

Assessment: Kywanna Road and its upgrade will separate the proposed new centre and associated uses from Bells Travelling Stock Reserve in a manner that is capable of achieving the separations distances identified in Section 4.2.4 having regard to the potential fire behaviour, examined at a strategic level. More detailed hazard assessment and site investigations would be required as per PBP 2019 however, the proposed structure plan approach seeks to establish separation between the proposed settlement pattern and the natural area of the reserve. Strategic-level APZs are provided at **Appendix B** which

demonstrate that further development is capable of accommodating the APZ requirements of PBP 2019.

For separation of Bells Travelling Stock Reserve, it is likely that an urban design approach as part of detailed site layout for the General residential area to the west can feasibly achieve separation from the hazard, likely via a perimeter road and other BPMs. Refer to the location of the western APZ along Bells Travelling Stock Reserve at **Appendix B**. The mitigation for the proposed Environmental living zone will rely on site-specific APZs that can only be determined at development assessment phase, as these will depend on the location of dwellings and other structures, given they will be dispersed across the zone and intermixed amongst vegetation. The terrain in this location precludes separation from the reserve via a new road, and the intent of the zoning would likely see existing vegetation remain in situ – the extent of which would be determined at development assessment stage. Notwithstanding the challenge with separation via road, separation from hazard by way of on-site APZs remains achievable.

Moreover that land in this location under the 2013 Structure Plan is zoned General residential with a minimum lot size of 450m². The 2025 Structure Plan alters the zoning to Environmental Living, increasing the minimum lot size to 20 hectares and decreasing the density. Overall exposure therefore decreases. Exposure to individual dwellings and assets is able to be adequately addressed by the BPMs mandated by PBP 2019 at the site specific scale.

Overall, the Planning Proposal represents an improved outcome in this location.

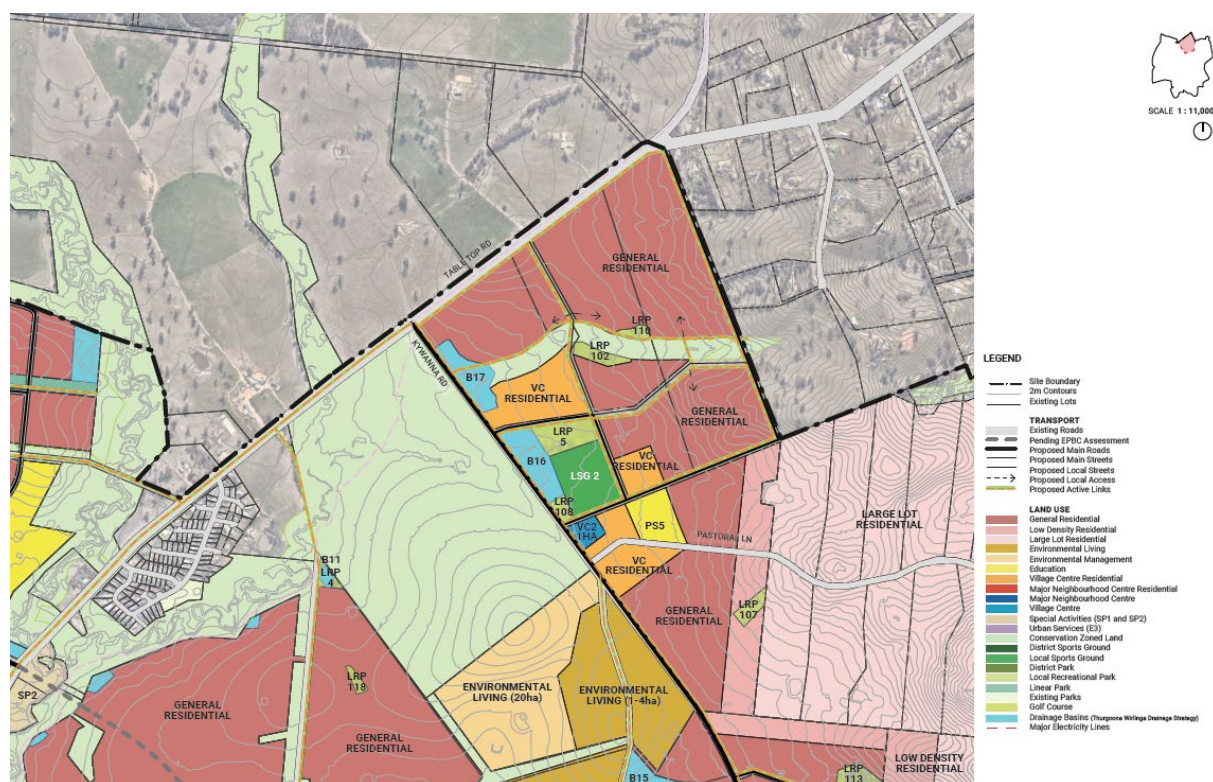


Figure 4-9: North-eastern extent zoning approach under the 2025 Structure Plan (Source: Albury City Council, 2025)

4.3.2.4 North-western extent

The zoning intent for this extent of the Structure Plan area has not changed substantially from the 2013 Structure Plan. The intent largely for General residential remains, and the green network through this area of the Structure Plan remains generally as identified in 2013.

This area of the Structure Plan is bound by the Hume Highway and transport corridor to the west, TAFE campus and General residential to the south, and grassland to the north. General residential development immediate adjacent to the highway includes a pocket of smaller

precincts surrounded by a network of natural corridors. Because this location is relatively less exposed to potential fire impacts, the development pattern may be acceptable provided:

- Separation from the corridors is achieved, perimeter roads would be preferable
- Cul-de-sac outcomes are avoided to the greatest degree possible
- At least two (2) access / egress routes from each pocket of development is available.

It is noted the TAFE facility may be subject to the requirements of Specification 43: Bushfire Protection for Certain Class 9 Buildings, and the NSW Rural Fire Service PBP 2025 Addendum. The TAFE site is traversed by a complex network of vegetated corridors which are mapped as Category 1 vegetation. It may be the case that ability to develop some parts of this area, or the uses proposed, are constrained in combination by SFPP provisions of PBP, the 2025 PBP Addendum, or Specification 43 which is a deemed-to-satisfy solution under the Building Code of Australia for Class 9 buildings within designated bushfire prone areas. Importantly, **this land is already zoned for this purpose and the Planning Proposal does not seek to change or amend this zoning.**

Similarly, the private school site, primary school site and high school site identified in this area of the Structure Plan will likely be required to address the same provisions identified above as each are located immediate adjacent to mapped Category 1 corridors. It is understood a development application for the Williams Road Private School has been submitted and was under determination at the time of writing.

Having regard to the above, it is noted in the 2025 Structure Plan that siting and co-location is consistent with the 2013 Structure Plan. The final location of future public schools within the Precinct will be determined by the Department of Education and subject to detailed due diligence¹². The 2025 Structure Plan notes the locations of 'High School 1' is indicative and it may be located elsewhere within the TAFE site.

The proposed location of a community centre in this part of the Structure Plan area is not identified as potentially subject to bush fire hazard.

Assessment: Overall, the mapped Category 1 corridors throughout this area of the Structure Plan are likely to give rise to mitigation triggered by the implementation of PBP 2019. This will need to be contemplated with regard to intended yields, as development will require separation from corridors (represented by the APZs at Appendix B). PBP 2019 requires perimeter roads as a key protection measure, in conjunction with APZs. Access and egress networks therefore are a particular focus. The 2025 Structure Plan provides for a range of network options, this is discussed further at Section 4.4 of this Study. Local road networks will need to be capable of achieving a minimum of two access and egress points for the pockets of proposed development in this locality. Strategic-level APZs are provided at **Appendix B** which demonstrate that further development is capable of accommodating the APZ requirements of PBP 2019. It is noted that APZs are not provided for the TAFE land noting the existing zoning in this part of the Structure Plan area is not proposed to change as part of the Planning Proposal.

The location of educational uses in this part of the Structure Plan area is generally consistent with the 2013 Structure Plan. As hazard exposure remains present (noting it is localised hazard rather than landscape-scale hazard by virtue of the vegetation being limited to what will be urban corridors), it will be incumbent upon site assessment processes to navigate how the provisions of PBP 2019, its 2025 Addendum and Specification 43 will be achieved. On-site layout will be key. In terms of the locational appropriateness of these educational activities, it is not considered by this Study that they present a level of exposure that is unable to be appropriately mitigated through the application of existing bush fire statutory planning and building provisions.

¹² 2025 Thurgoona Wirlinga Structure Plan, Albury City Council

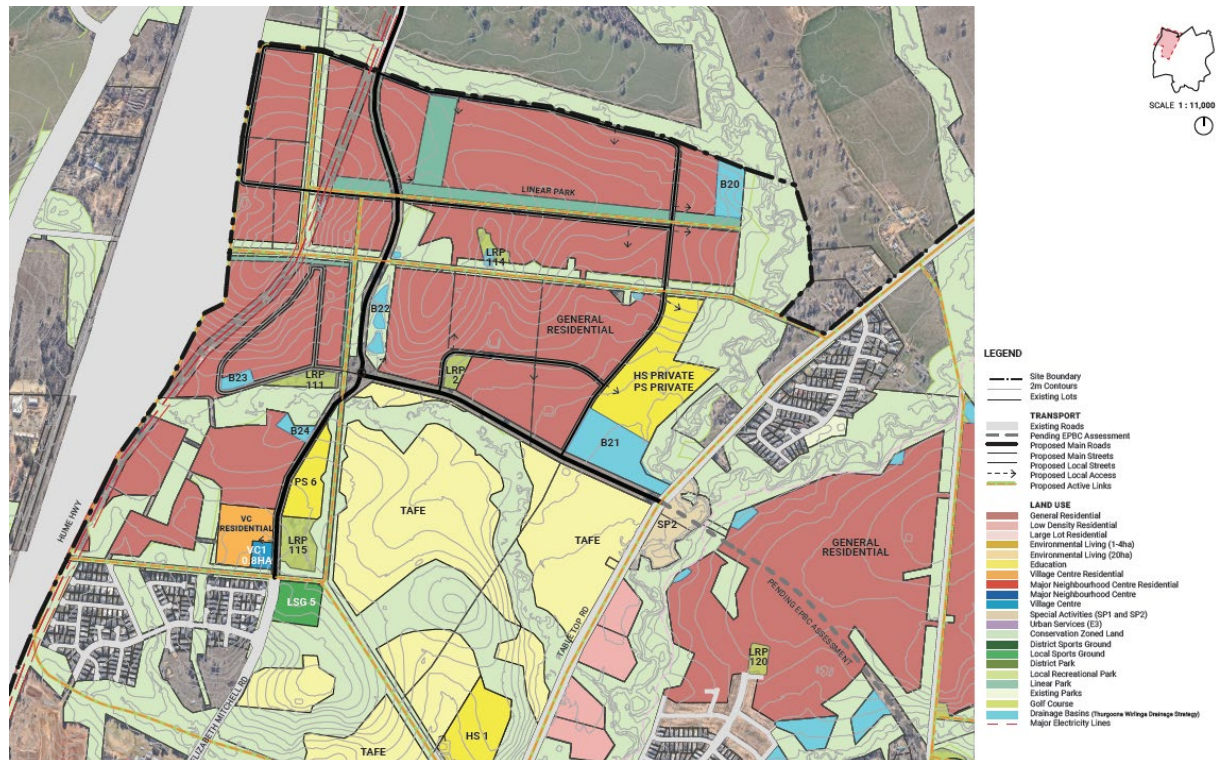


Figure 4-10: North-western extent zoning approach under the 2025 Structure Plan (Source: Albury City Council, 2025)

4.3.3 Staging

The staging plan below, which is contained within the 2025 Structure Plan, identifies the servicing arrangements that underpin land availability within the precinct trough to 2065.

On a more discrete scale, staging of development as it occurs throughout the implementation life of the Structure Plan will need to consider interim separation from hazard and this is likely to rely on a spectrum of mitigation approaches.

Whilst staging is largely a development assessment consideration, flagging its importance via strategic planning is advantageous, and can enable urban design approaches that have regard to interim mitigation and separation from hazard to provide interim protection for development until later stages are developed, but also to limit unnecessary construction costs. It also front-loads the consideration of pre-emptive vegetation clearing to achieve interim APZs.

Approaches might include:

- Implementation of separation that is guaranteed, i.e. using roads or parks to define stage boundaries
- Including interim asset protection zones (pending ownership, management responsibility and conditioning to ensure it can be implemented and liability/responsibility established). Ideally, such an approach would be the responsibility of developers and land holders, and not the Council
- Construction standards where separation cannot be achieved. This may be supplemented by radiant heat shielding, pending NSW Rural Fires Services assessment and approval).

It is not acceptable in the case of Thurgoona Wirlinga to avoid interim mitigation and separation from hazard on the basis of future development, or future stages, as ultimately this may not occur.

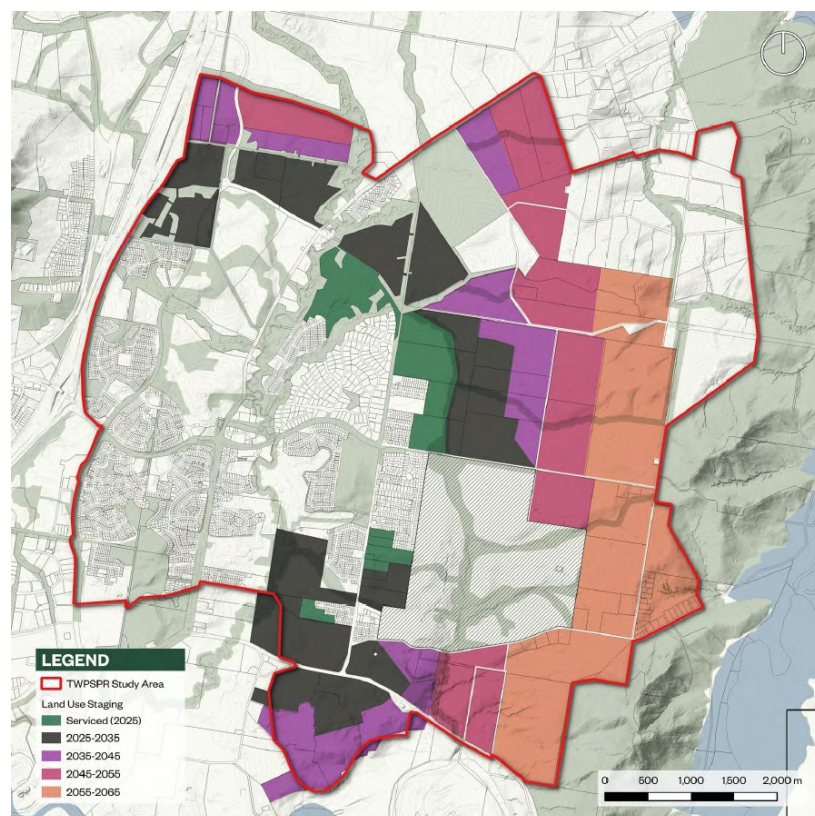


Figure 4-11: Structure Plan staging (Source: Albury City Council)

4.4 Access and egress

The strategic bush fire study provisions also requires a focus on the assessment of emergency access and evacuation ability, having regard to the assessment considerations outlined below.

Table 4-10: PBP 2019 strategic access and egress (evacuation) requirements

Issue	Detail	Assessment considerations
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	- The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile; - The location of key access routes and direction of travel; and - The potential for development to be isolated in the event of a bush fire.

The above assessment considerations are addressed as follows.

The transport network which underpins the 2025 Structure Plan has been subject to ongoing traffic studies over recent decades which consecutively build upon the data upon which route network decisions have been made. An established route network already services the western portion of the Structure Plan area.

New transport routes within the Structure Plan will accord with Transport for NSW's Design of Roads and Streets Manual.

It is noted that BPMs contained within PBP 2019 which will be relevant at development assessment stage include additional requirements to achieve bush fire protection, which can include additional widths to road reserves for perimeter roads.

The 2013 Structure Plan Technical Report prepared by RPS Australia includes a transportation and traffic assessment, which continues to remain relevant to the 2025 revision.

It notes the estimated traffic demand for the area is expected to be 14,500 vehicles per hour to the east of the Hume Highway. Based on distribution analysis the following additional traffic volumes are to be catered for by the road network:

- 14,500vpd and 1,450vph to the north
- 21,800vpd and 2,200vph to the south
- 21,800vpd and 2,200vph to Lavington
- 28,900vpd and 2,900vph to the CBD
- 58,000vpd and 5,800vph contained within the study area¹³.

The 2025 revision of the Structure Plan reconfigures and updates some aspects of the road network based on needs and refinement of the Structure Plan detail. The 2025 Structure Plan is more detailed in its articulation of the movement network.

Overall and as identified by the 2013 RPS study, the Structure Plan area is based on a gridded network pattern which is optimal in terms of supporting emergency evacuation. Intersection

¹³ 2013 Thurgoona Wirlinga Structure Plan Technical Report, RPS Australia, Available online at <https://www.alburycity.nsw.gov.au/strategies-and-plans/thurgoona-wirlinga-precinct-structure-plan>

analysis and connect back to the State controlled road network has led to enhanced outcomes in the planning of the movement network overall.

Assessment: The 2025 Structure Plan does not give rise to any specific areas of evacuation concern, noting that multiple access and egress options must be made available and this is specified by the BPMs of PBP 2019. Overall, this is generally capable of being achieved. Whilst existing traffic studies have not specifically addressed emergency evacuation capacity, given the location and connection of this precinct, it does not present significant risks for evacuation. Local road networks will need to be capable of achieving a minimum of two access and egress points for the pockets of proposed development in this locality.

Parties involved in the design of the road network must consult the detail design specifications for roads on mapped BFPL contained within PBP 2019¹⁴. This will avoid unnecessary design issues arising at development assessment stage, and unnecessary and avoidable reliance on performance-based solutions to comply with the objectives of PBP 2019.

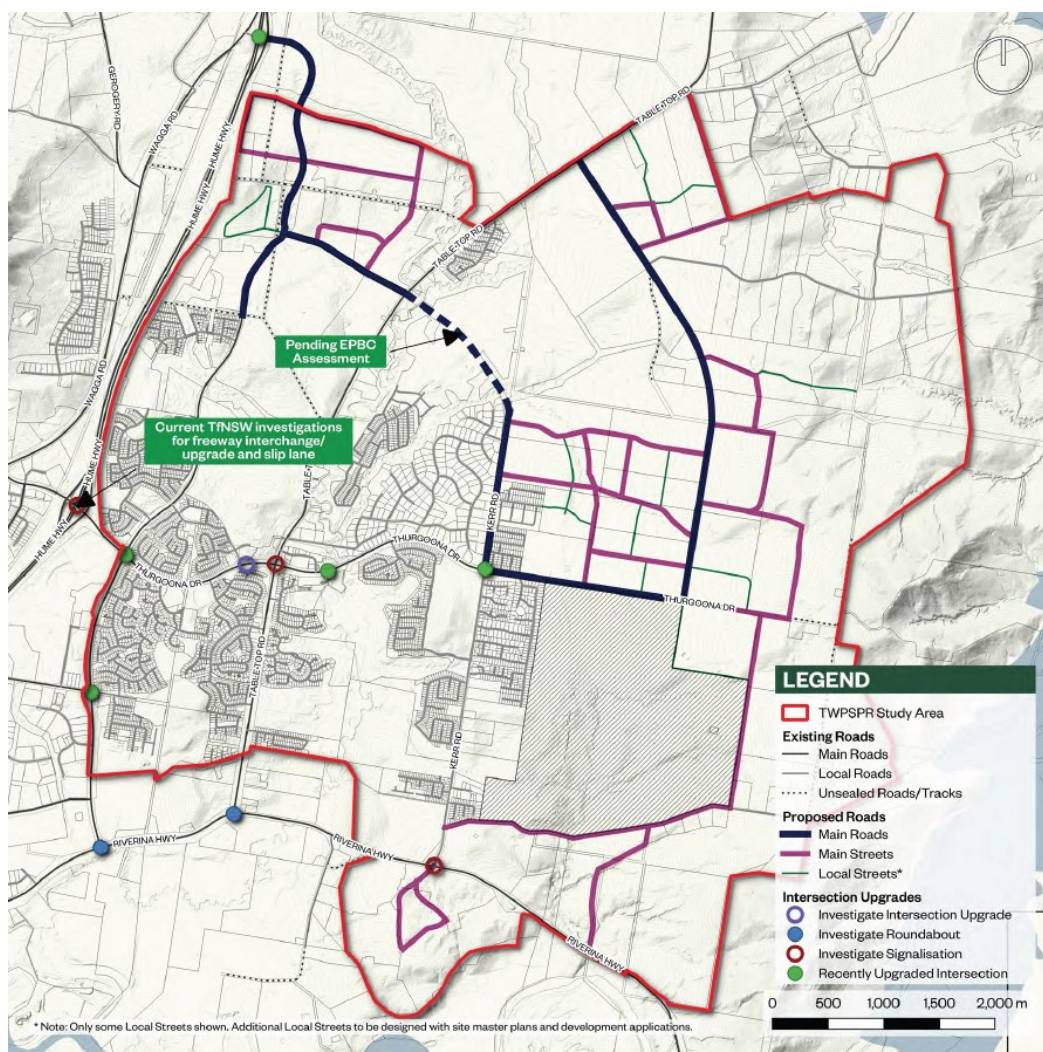


Figure 4-12: Movement network map contained within the 2025 Structure Plan (Source: Albury City Council, 2025)

¹⁴ NSW Rural Fire Service, 2019, Planning for Bush Fire Protection, Available online at <https://www.rfs.nsw.gov.au/plan-and-prepare/building-on-bush-fire-prone-land/planning-for-bush-fire-protection>

4.5 Emergency services

The strategic bush fire study provisions further require the assessment of emergency services requirements, having regard to the assessment considerations outlined below.

Table 4-11: PBP 2019 strategic emergency services requirements

Issue	Detail	Assessment considerations
Emergency services	An assessment of the future impact of new development on emergency services.	- Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/ brigades; and - Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.

The above assessment considerations are addressed as follows.

4.5.1 Increase in demand on emergency services

It could be contemplated that any intensification of urban development inherently increases the local resident, visitor and working population, which in-turn increases demand or reliance on local emergency services.

However, given the nature and extent of urban activities already established in Thurgoona Wirlinga, as well as those which may locate within the area into the future is likely to require continuous government investment in:

- The ongoing program of bush fire hazard reduction in accordance with the draft Southern Border BFRMP
- Continued fire services resources, training, facilities and equipment for urban fire, HAZMAT and grassfire bush fire suppression; and
- Noting the nature of the intended changes proposed by the Structure Plan, it is not anticipated that reliance on future grassfire and bush fire suppression services would necessarily be significantly higher than at present by virtue of the extent of the Structure Plan area already developed.

4.5.2 Ability for suppression

The Structure Plan area is, over time, to be serviced by reticulated water supply. Servicing of land will be staged in accordance with the Structure Plan staging plan. Sufficient water supply quantities and pressure is required as part of any water supply system for the area.

Ability for suppression is supported primarily by the road and movement network. As documented above, the Structure Plan largely adopts a gridded route network approach which is advantageous for emergency access and egress.

Fire trails should not be accepted in lieu of perimeter roads. The only location of the Structure Plan area where fire trails are relevant is within the Bells Travelling Stock Reserve however, this matter is beyond the scope of this Study to make comment on, noting this reserve is owned by the State government. However, as development of the Structure Plan area occurs, Local Land Services, as part of the Southern Border BFMC may need to transition its mitigation measures as surrounding land uses transition from rural to urban.

4.6 Infrastructure

The strategic bush fire study provisions further require the assessment of infrastructure requirements, having regard to the assessment considerations outlined below.

Table 4-12: PBP 2019 strategic considerations for infrastructure

Issues	Detail	Assessment considerations
Infrastructure	An assessment of the issues associated with infrastructure and utilities.	- The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants; and - Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.

The above assessment considerations are addressed as follows.

4.6.1 Water supply

The Structure Plan area is, over time, to be serviced by reticulated water supply. Servicing of land will be staged in accordance with the Structure Plan staging plan. Sufficient water supply quantities and pressure is required as part of any water supply system for the area.

Compliance with the above satisfies the PBP 2019 provisions in relation to flow, pressure and integrity of the water supply. PBP 2019 further requires that hydrants are not located within any road carriageway.

Provisions in relation to water supply are required to be incorporated within any development controls, as a fundamental component of firefighting.

4.6.2 Electricity

The Albury electrical network is currently serviced by two zone substations located at Union Road and Jelbart Road. Two high voltage 132kV lines traverse the Thurgoona Wirlinga Structure Plan area along the southern and western boundaries. These lines require appropriate land use buffers, approximately 40m from the centreline. These high voltage lines are supported by a network of 22kV and low voltage lines that are periodically rolled out in line with new development. Planning for electrical infrastructure in Albury is managed by Essential Energy¹⁵.

Ideally, electricity infrastructure outside of high voltage transmission infrastructure and substations within the Structure Plan area, is located underground.

4.6.3 Strategic infrastructure proximity and protection

It is the case that infrastructure assets within the Structure Plan area may require mitigation for grass fire and bush fire protection including substations, transmission easements, etc. There is a pressurised gas line located along the northern edge of the Structure Plan area, adjacent to the Hume Highway. In addition, the Defence land includes an ammunition depot and it is understood that, at least at present, live firing does occur on the site, which may present an ignition risk. Notwithstanding this, Department of Defence maintain robust bush fire management plans and land management arrangements to minimise these risks.

Structure planning that locates roads along the boundaries of the Defence land may assist to further mitigate risk of fire transition out of the Defence lands, assuming it remains in perpetuity.

Compliance with specific BPMs contained within PBP 2019 are capable of addressing mitigation for site-based infrastructure assets.

¹⁵ 2025 Thurgoona Wirlinga Structure Plan, Albury City Council

4.7 Adjoining land

The strategic bush fire study provisions require the assessment of implications for adjoining lands, having regard to the assessment considerations outlined below.

Table 4-13: PBP 2019 strategic considerations for adjoining land

Issue	Detail	Assessment considerations
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management.	Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.

The above assessment considerations are addressed as follows.

4.7.1 Impact on adjoining lands

In terms of adjoining lands and landholders, it is noted that the majority of the surrounding land comprises agricultural / rural uses, nature reserve estates, existing urban and industrial development, and infrastructure corridors existing industrial land uses.

For land management relating to natural area reserves, ongoing local and State government investment in land management is likely to be required through a program of hazard reduction burns and other mitigation measures in accordance with the Southern Border BFRMP.

For residential and other urban activities in the broader structure plan area and beyond, the exposure remains unchanged.

For the Defence land, it is intended to be surrounded by residential development and other uses of various densities. It is foreseeable that the ignition and fire transition risk from the Defence land may require additional measures over time, as the surrounding population and built form transitions.

5 Statutory assessment

This section provides an assessment of the statutory and regulatory measures in plan with regard to the consideration of bush fire risk as part of strategic planning activities.

5.1 Planning control recommendations

The amendments to the Albury LEP 2010 are set out at Section 2.1 and the land use assessment at Section 4.3 of this report details the bush fire considerations relating to the Planning Proposal and notably the proposed zoning amendments, the outcomes sought and provides an assessment of the bush fire considerations per Chapter 4 of PBP which relates to strategic planning.

With regard to the proposed DCP, the following objectives and controls are proposed:

Bushfire management

Objectives

1. To minimise risk to life, property and the environment in the event of a bushfire, including the lives of emergency personnel.
2. To ensure that all development on bushfire prone land makes adequate provision for access for emergency personnel, vehicles and equipment, and for emergency evacuation.
3. To balance the risk of bushfire to life and property with the other aims, objectives and controls in this part, including the need to maintain and improve vegetation.

Controls

1. A Bushfire Assessment Report, prepared in accordance with Planning for Bushfire Protection published by NSW Rural Fire Service, must accompany all development applications on land identified as bushfire prone land. Relevant aspects of the Southern Border Bush Fire Risk Management Plan are to be incorporated.
2. Land and corridors that are subject to revegetation and rehabilitation are assessed based on the mature fuel load intended to be established.
3. Roads within subdivision development applications mapped as Bushfire Prone Land, must comply with the Planning for Bushfire Protection road design provisions and the AlburyCity Engineers Guidelines, where there are inconsistencies the Planning for Bushfire Protection provisions prevail.
4. Asset Protection Zones for development on certified land in the Albury Local Environmental Plan 2010 must be wholly located on certified land, are to be maintained in a low fuel condition in accordance with Planning for Bush Fire Protection, and must not incorporate combustible material of any form.
5. The provision of interim Asset Protection Zones is identified where relevant as part of staged development.

The above seeks to ensure that corridors intended to be established must be assessed on the basis of mature fuel loads, which is relevant should the circumstance arise where bush fire prone land mapping spot changes do not occur before relevant development applications for subdivision are lodged.

5.2 Local Planning Direction 4.3

Local Planning Directions are issued by the Minister for Planning to relevant planning authorities under section 9.1(2) of the EP&A Act. These directions apply to planning proposals.

Local Planning Direction 4.3 – Planning for Bush fire Protection Schedule 1, has two objectives:

1. Protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and
2. Encourage sound management of bush fire prone areas.

Local Planning Direction 4.3 applies to planning proposals that will affect land that is, or is in proximity to, land mapped as bush fire prone land. As such, Local Planning Direction 4.3 applies to this planning proposal.

An assessment against the aspects of Direction 4.3 is provided below.

Table 5-1: Assessment against Local Planning Direction 4.3

Direction 4.3	Assessment
In the preparation of a planning proposal the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service following receipt of a gateway determination under section 3.34 of the Act, and prior to undertaking community consultation in satisfaction of clause 4, Schedule 1 to the EP&A Act, and take into account any comments so made.	The purpose of this Study is to undertake a detailed assessment of the potential nature of bush fire risk being generated by strategic planning activities. Albury City Council sought early advice from NSW RFS prior to the preparation of the Planning Proposal, and received early advice to Council dated 31 October 2025, which has been fulsomely addressed by this Study.
A planning proposal must: (a) have regard to Planning for Bushfire Protection 2019, (b) introduce controls that avoid placing inappropriate developments in hazardous areas, and (c) ensure that bushfire hazard reduction is not prohibited within the Asset Protection Zone (APZ).	This Bush Fire Strategic Study has regard to Chapter 4 of PBP, as required. This Study has assessed the nature of proposed zoning from a risk-based perspective. It is acknowledged the Thurgoona Wirlinga Precinct is exposed to localised bush fire hazard as well as grassfire hazard however, it is located such that it limits exposure to extensive landscape-scale fire runs. APZs are identified around the perimeter of the Precinct that interfaces with potential hazard, and internal corridors that are intended to be rehabilitated. APZs identified by this Study demonstrate that development is capable of compliance with the APZ requirements of PBP 2019. It is noted that these may vary at detailed design stage. Despite this, the purpose of its examination at the strategic planning stage, per the Local Planning Direction, is to ensure that bushfire hazard reduction within the APZ is not prohibited or otherwise limited, which is confirmed by the APZs identified at Appendix B.
A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:	APZs are identified around the perimeter of the Precinct that interfaces with potential hazard, and internal corridors that are intended to be rehabilitated. APZs identified by this Study demonstrate that development is capable of compliance with the APZ requirements of PBP 2019. It is noted that these may vary at detailed design stage. Despite this, the purpose of its

(a) provide an Asset Protection Zone (APZ) incorporating at a minimum:

i. an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and

ii. an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,

(b) for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with,

(c) contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,

(d) contain provisions for adequate water supply for firefighting purposes,

(e) minimise the perimeter of the area of land interfacing the hazard which may be developed,

(f) introduce controls on the placement of combustible materials in the Inner Protection Area.

examination at the strategic planning stage, per the Local Planning Direction, is to ensure that bushfire hazard reduction within the APZ is not prohibited or otherwise limited, which is confirmed by the APZs identified at **Appendix B**.

Inner and outer APZs are identified however, the environmental integrity of proposed corridors is maintained by ensuring outer APZs do not intrude into these locations.

This Study identifies that ability to comply with PBP without unnecessary reliance on performance-based solutions can be achieved, and the nature of land use changes proposed is appropriate. This is detailed in the later parts of this section of this report.

The bushfire management controls proposed for incorporation into the DCP include provisions which ensure that mature fuel loads for vegetated corridors are assessed. This is included such that regardless of bush fire prone land mapping, the intent for the corridors is assessed.

Despite the interface with corridors, the context of the Precinct must be considered. Most corridors within the Precinct enter from the east, associated with grasslands. Opportunities exist as part of rehabilitation / landscape concept planning or as part of infrastructure design, to break the fuel connectivity of the corridors, on balance with environmental aspirations. Until this work is undertaken, the corridors are identified as potential bush fire hazard with associated APZs.

5.3 PBP 2019 Chapter 4 Strategic Principles

The strategic planning principles set out at Chapter 4 of PBP 2019 outline the benchmarks for criteria against which strategic planning activities should be undertaken. A summary assessment of the outcomes of this Study are provided against these principles in the table that follows.

Table 5-2: Assessment of Chapter 4 strategic planning principles

Chapter 4 principle	Strategic Assessment
Ensuring land is suitable for development in the context of bush fire risk	The 2025 Structure Plan, as a revision of the 2013 Thurgoona Wirlinga Structure Plan, continues to demonstrate suitability of land use in the context of bush fire exposure to hazard and risk. This study has explored the changes to proposed zoning between the Albury LEP 2010 and that of the Planning Proposal, to implement the 2025 Structure Plan, to consider the appropriateness of land use transition. Overall, the zoning amendments of the Planning Proposal represent a balanced approach which integrates considerations of bush fire hazard and risk to mitigate potential for impact in the long term.
Ensuring new development on bush fire prone land will comply with PBP 2019	This study identifies the ability for compliance with BPMs of PBP 2019 as they stand at the time of writing. Asset protection zones are identified, demonstrating ability to ensure development is separated from potential bush fire hazard.
Minimising reliance on performance-based solutions	This study identifies the ability for compliance with BPMs of PBP 2019 as they stand at the time of writing without unnecessary or undue reliance upon performance-based solutions.
Providing adequate infrastructure associated with emergency evacuation and firefighting operations	The 2025 Structure Plan is supported by detailed technical studies that have been undertaken for more than a decade, informing a detailed approach to forward planning and infrastructure services that aid emergency services.
Facilitating appropriate ongoing land management practices	This Study has had regard to ongoing land management, noting that changes over time may be regard as land uses transition from rural to urban. This is particularly amplified for the Bells Travelling Stock Reserve which presents level of hazard but which in itself, is a critical and much valued natural asset.

5.3.1 Exclusion of inappropriate development indicators

Chapter 4 of PBP identifies a number of indicators of potential inappropriate development. An assessment against these is provided in the following table.

Table 5-3: Assessment of Chapter 4 inappropriate development indicators

Chapter 4 inappropriate development indicator	Strategic Assessment
The development area is exposed to a high bush fire risk and should be avoided	The Thurgoona Wirlinga Structure Plan area is not, as a whole, identified within a high risk landscape or situation. Whilst fire runs are present, these are capable of being mitigated – largely owing to exposure to grassfire hazard. The Bells Travelling Stock Reserve remains a key area of elevated risk, which is

	capable of being addressed through a spectrum of strategic planning, urban design, and bush fire protection measures approaches.
The development is likely to be difficult to evacuate during a bush fire due to its siting in the landscape, access limitations, fire history and/or size and scale	This Study identifies a spectrum of route options available for emergency access and agrees across the Structure Plan area. The Structure Plan adopts a grid-based movement network design, which aids multiple options in case of emergency. Locations where pockets of development may occur must be serviced by at least two (2) access and egress routes.
The development will adversely effect other bush fire protection strategies or place existing development at increased risk	This study does not identify any change to the existing risk profile relating to adjoining assets or lands within vicinity of the Structure Plan area.
The development is within an area of high bush fire risk where density of existing development may cause evacuation issues for both existing and new occupants	As above, The Thurgoona Wirlinga Structure Plan area is not, as a whole, identified within a high risk landscape or situation. Whilst fire runs are present, these are capable of being mitigated – largely owing to exposure to grassfire hazard. The Bells Travelling Stock Reserve remains a key area of elevated risk, which is capable of being addressed through a spectrum of strategic planning, urban design, and bush fire protection measures approaches. This Study identifies a spectrum of route options available for emergency access and agrees across the Structure Plan area. The Structure Plan adopts a grid-based movement network design, which aids multiple options in case of emergency. The risk of debris impact to these routes is low, with the majority of fire risk relating to the Structure Plan area being grass fire hazard. Having regard to the above and the expected population increase, ability to evacuate is proposed to be appropriately served by the urban road network, both existing and future identified by the 2025 Structure Plan, and its staging plan. A bush fire specific evacuation strategy is not considered necessary in this instance given the low exposure of the proposed road network, and the volume of route options proposed. Locations where pockets of development may occur must be serviced by at least two (2) access and egress routes. Further analysis is required at the detailed design phase.
The development has environmental constraints to the area which cannot be overcome	The 2025 Structure Plan is informed by a Level 1 BAM assessment which has identified important environmental values. It is not anticipated that bush fire protection measures would necessarily impact upon these values, with the principles of separating

	development from these natural areas in the first instance.
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APPENDICES

Appendix A – FLAMESOL Fire Behaviour Calculations

Grassland GFDI 110 - Scenario 1



Calculated December 6, 2025, 1:45 pm (MDc v.4.9)

FDI80 Grassland Av Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	110	Rate of spread	21.63 km/h
Vegetation Classification	Grassland	Flame length	9.76 m
Understorey fuel load	6 t/ha	Flame angle	55 °, 66 °, 75 °, 80 °, 82 ° & 87 °
Total fuel load	6 t/ha	Elevation of receiver	3.57 m, 3.88 m, 3.86 m, 3.57 m, 3.35 m & 0.99 m
Vegetation height	n/a	Fire intensity	67,064 kW/m
Effective slope	6 °	Transmissivity	0.882, 0.867, 0.846, 0.823, 0.8100000000000001 & 0.741
Site slope	3 °	Viewfactor	0.5948, 0.4377, 0.2939, 0.1991, 0.1621 & 0.0442
Flame width	100 m	Minimum distance to < 40 kW/m²	7.9 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	10.8 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	16.1 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	23.5 m
		Minimum distance to < 10 kW/m²	28.3 m

Grassland GFDI 110 – Scenario 2



Calculated December 7, 2025, 12:18 pm (MDc v.4.9)

FDI80 Grassland Max Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	110	Rate of spread	32.72 km/h
Vegetation Classification	Grassland	Flame length	12 m
Understorey fuel load	6 t/ha	Flame angle	55 °, 66 °, 74 °, 79 °, 81 ° & 86 °
Total fuel load	6 t/ha	Elevation of receiver	4.4 m, 4.78 m, 4.74 m, 4.42 m, 4.17 m & 1.6 m
Vegetation height	n/a	Fire intensity	101,459 kW/m
Effective slope	12 °	Transmissivity	0.877, 0.86, 0.837, 0.8120000000000001, 0.799 & 0.733
Site slope	3 °	Viewfactor	0.5969, 0.4403, 0.2982, 0.2017, 0.1639 & 0.0447
Flame width	100 m	Minimum distance to < 40 kW/m²	9.699999999999999 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	13.2 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	19.5 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	28 m
		Minimum distance to < 10 kW/m²	33.5 m

Grassland GFDI 110 – Scenario 3



Calculated December 7, 2025, 12:24 pm (MDc v.4.9)

FDI80 Grassland SFPP Av Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	110	Rate of spread	21.63 km/h
Vegetation Classification	Grassland	Flame length	9.76 m
Understorey fuel load	6 t/ha	Flame angle	68 °, 75 °, 80 °, 83 °, 84 ° & 88 °
Total fuel load	6 t/ha	Elevation of receiver	3.91 m, 3.88 m, 3.6 m, 3.14 m, 2.83 m & 0 m
Vegetation height	n/a	Fire intensity	67,064 kW/m
Effective slope	6 °	Transmissivity	0.871, 0.855, 0.833, 0.8090000000000001, 0.797 & 0.738
Site slope	3 °	Viewfactor	0.4079, 0.3015, 0.2038, 0.1382, 0.1121 & 0.0302
Flame width	100 m	Minimum distance to < 40 kW/m²	11.6 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	15.7 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	23 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	32.5 m
		Minimum distance to < 10 kW/m²	38.6 m

Grassland GFDI 110 – Scenario 4



Calculated December 7, 2025, 12:28 pm (MDC v.4.9)

FDI80 Grassland SFPP Max Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	110	Rate of spread	32.72 km/h
Vegetation Classification	Grassland	Flame length	12 m
Understorey fuel load	6 t/ha	Flame angle	68 °, 74 °, 79 °, 82 °, 83 ° & 87 °
Total fuel load	6 t/ha	Elevation of receiver	4.82 m, 4.77 m, 4.45 m, 3.94 m, 3.6 m & 0.52 m
Vegetation height	n/a	Fire intensity	101,459 kW/m
Effective slope	12 °	Transmissivity	0.863, 0.846, 0.822, 0.798, 0.786 & 0.731
Site slope	3 °	Viewfactor	0.4123, 0.3063, 0.2067, 0.1397, 0.1135 & 0.0305
Flame width	100 m	Minimum distance to < 40 kW/m ²	14.1 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	19 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	27.4 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m ²	38.2 m
		Minimum distance to < 10 kW/m ²	44.9 m

Grassland GFDI 130 – Scenario 1



Calculated December 7, 2025, 12:32 pm (MDC v.4.9)

FDI100 Grassland Av Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	130	Rate of spread	25.56 km/h
Vegetation Classification	Grassland	Flame length	10.61 m
Understorey fuel load	6 t/ha	Flame angle	55 °, 66 °, 75 °, 80 °, 81 ° & 87 °
Total fuel load	6 t/ha	Elevation of receiver	3.89 m, 4.22 m, 4.2 m, 3.9 m, 3.65 m & 1.22 m
Vegetation height	n/a	Fire intensity	79,258 kW/m
Effective slope	6 °	Transmissivity	0.88, 0.865, 0.842, 0.819, 0.806 & 0.738
Site slope	3 °	Viewfactor	0.5944, 0.4393, 0.295, 0.2005, 0.163 & 0.0444
Flame width	100 m	Minimum distance to < 40 kW/m ²	8.6 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	11.7 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	17.4 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m ²	25.2 m
		Minimum distance to < 10 kW/m ²	30.3 m

Grassland GFDI 130 – Scenario 2



Calculated December 7, 2025, 12:36 pm (MDC v.4.9)

FDI100 Grassland Max Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	130	Rate of spread	38.67 km/h
Vegetation Classification	Grassland	Flame length	13.05 m
Understorey fuel load	6 t/ha	Flame angle	55 °, 66 °, 74 °, 79 °, 80 ° & 86 °
Total fuel load	6 t/ha	Elevation of receiver	4.79 m, 5.2 m, 5.17 m, 4.83 m, 4.55 m & 1.91 m
Vegetation height	n/a	Fire intensity	119,906 kW/m
Effective slope	12 °	Transmissivity	0.875, 0.857, 0.833, 0.8070000000000001, 0.794 & 0.73
Site slope	3 °	Viewfactor	0.5997, 0.4416, 0.2998, 0.2028, 0.1651 & 0.0448
Flame width	100 m	Minimum distance to < 40 kW/m ²	10.5 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	14.3 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	21 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m ²	30 m
		Minimum distance to < 10 kW/m ²	35.7 m

Grassland GFDI 100 – Scenario 3



Calculated December 7, 2025, 12:38 pm (MDC v.4.9)

FDI100 Grassland SFPP Av Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	130	Rate of spread	25.56 km/h
Vegetation Classification	Grassland	Flame length	10.61 m
Understorey fuel load	6 t/ha	Flame angle	68 °, 74 °, 79 °, 82 °, 83 ° & 88 °
Total fuel load	6 t/ha	Elevation of receiver	4.25 m, 4.2 m, 3.91 m, 3.43 m, 3.11 m & 0.18 m
Vegetation height	n/a	Fire intensity	79,258 kW/m
Effective slope	6 °	Transmissivity	0.868, 0.852, 0.829, 0.805, 0.793 & 0.735
Site slope	3 °	Viewfactor	0.4114, 0.3039, 0.205, 0.1389, 0.1125 & 0.0304
Flame width	100 m	Minimum distance to < 40 kW/m ²	12.5 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	16.9 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	24.7 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m ²	34.7 m
		Minimum distance to < 10 kW/m ²	41.1 m

Grassland GFDI 130 – Scenario 4



Calculated December 7, 2025, 12:41 pm (MDC v.4.9)

FDI100 Grassland SFPP Max Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	130	Rate of spread	38.67 km/h
Vegetation Classification	Grassland	Flame length	13.05 m
Understorey fuel load	6 t/ha	Flame angle	67 °, 73 °, 78 °, 81 °, 82 ° & 87 °
Total fuel load	6 t/ha	Elevation of receiver	5.2 m, 5.16 m, 4.84 m, 4.31 m, 3.96 m & 0.79 m
Vegetation height	n/a	Fire intensity	119,906 kW/m
Effective slope	12 °	Transmissivity	0.861, 0.843, 0.8179999999999999, 0.794, 0.783 & 0.728
Site slope	3 °	Viewfactor	0.4154, 0.3075, 0.2075, 0.1407, 0.1141 & 0.0307
Flame width	100 m	Minimum distance to < 40 kW/m ²	15.2 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	20.5 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	29.4 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m ²	40.6 m
		Minimum distance to < 10 kW/m ²	47.6 m

DSF FDI 80 – Scenario 1



Calculated December 7, 2025, 12:44 pm (MDC v.4.9)

FDI80 DSF Av Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	80	Rate of spread	2.03 km/h
Vegetation Classification	Forest	Flame length	16.22 m
Understorey fuel load	14 t/ha	Flame angle	54 °, 65 °, 73 °, 77 °, 79 ° & 85 °
Total fuel load	25.09 t/ha	Elevation of receiver	5.87 m, 6.43 m, 6.42 m, 6.03 m, 5.76 m & 2.89 m
Vegetation height	n/a	Fire intensity	26,357 kW/m
Effective slope	6 °	Transmissivity	0.87, 0.849, 0.822, 0.796, 0.783 & 0.723
Site slope	3 °	Viewfactor	0.6025, 0.4472, 0.3025, 0.2062, 0.1677 & 0.0453
Flame width	100 m	Minimum distance to < 40 kW/m ²	13 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	17.5 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	25.5 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m ²	35.6 m
		Minimum distance to < 10 kW/m ²	42 m

DSF FDI 80 – Scenario 2



Calculated December 7, 2025, 12:47 pm (MDC v.4.9)

FDI 80 DSF Max Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	80	Rate of spread	3.07 km/h
Vegetation Classification	Forest	Flame length	23.1 m
Understorey fuel load	14 t/ha	Flame angle	53 °, 63 °, 70 °, 74 °, 76 ° & 83 °
Total fuel load	25.9 t/ha	Elevation of receiver	8.26 m, 9.02 m, 9.06 m, 8.67 m, 8.380000000000001 m & 5.19 m
Vegetation height	n/a	Fire intensity	41,162 kW/m
Effective slope	12 °	Transmissivity	0.859, 0.834, 0.804, 0.778, 0.766 & 0.71
Site slope	3 °	Viewfactor	0.6118, 0.4569, 0.3096, 0.2106, 0.1715 & 0.0462
Flame width	100 m	Minimum distance to < 40 kW/m ²	18.2 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	24.2 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	34.2 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m ²	46.4 m
		Minimum distance to < 10 kW/m ²	53.8 m

DSF FDI 80 – Scenario 3



Calculated December 7, 2025, 12:50 pm (MDC v.4.9)

FDI 80 DSF SFPP Av Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	80	Rate of spread	2.03 km/h
Vegetation Classification	Forest	Flame length	16.32 m
Understorey fuel load	14 t/ha	Flame angle	66 °, 72 °, 77 °, 80 °, 81 ° & 86 °
Total fuel load	25.9 t/ha	Elevation of receiver	6.46 m, 6.45 m, 6.1 m, 5.53 m, 5.15 m & 1.69 m
Vegetation height	n/a	Fire intensity	27,208 kW/m
Effective slope	6 °	Transmissivity	0.852, 0.832, 0.806, 0.783, 0.772 & 0.72
Site slope	3 °	Viewfactor	0.4181, 0.311, 0.2103, 0.1425, 0.1155 & 0.031
Flame width	100 m	Minimum distance to < 40 kW/m ²	18.9 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	25 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	35.2 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m ²	47.7 m
		Minimum distance to < 10 kW/m ²	55.4 m

DSF FDI 80 – Scenario 4



Calculated December 7, 2025, 12:53 pm (MDC v.4.9)

FDI 80 DSF SFPP Max Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	80	Rate of spread	3.07 km/h
Vegetation Classification	Forest	Flame length	23.1 m
Understorey fuel load	14 t/ha	Flame angle	64 °, 70 °, 74 °, 77 °, 78 ° & 85 °
Total fuel load	25.9 t/ha	Elevation of receiver	9.029999999999999 m, 9.09 m, 8.699999999999999 m, 8.1 m, 7.67 m & 3.8 m
Vegetation height	n/a	Fire intensity	41,162 kW/m
Effective slope	12 °	Transmissivity	0.837, 0.8139999999999999, 0.789, 0.768, 0.758 & 0.705
Site slope	3 °	Viewfactor	0.4264, 0.3173, 0.2149, 0.1455, 0.1178 & 0.0317
Flame width	100 m	Minimum distance to < 40 kW/m ²	25.8 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	33.5 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	45.7 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m ²	60.2 m
		Minimum distance to < 10 kW/m ²	69.09999999999999 m

DSF FDI 100 – Scenario 1



Calculated December 7, 2025, 12:55 pm (MDc v.4.9)

FDI 100 DSF Av Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	2.54 km/h
Vegetation Classification	Forest	Flame length	19.62 m
Understorey fuel load	14 t/ha	Flame angle	54 °, 64 °, 71 °, 76 °, 77 ° & 84 °
Total fuel load	25.9 t/ha	Elevation of receiver	7.11 m, 7.72 m, 7.71 m, 7.36 m, 7.04 m & 4 m
Vegetation height	n/a	Fire intensity	34,010 kW/m
Effective slope	6 °	Transmissivity	0.864, 0.841, 0.8120000000000001, 0.786, 0.774 & 0.716
Site slope	3 °	Viewfactor	0.6071, 0.4528, 0.3068, 0.2084, 0.1698 & 0.0458
Flame width	100 m	Minimum distance to < 40 kW/m ²	15.6 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	20.9 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	29.9 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m ²	41.2 m
		Minimum distance to < 10 kW/m ²	48.1 m

DSF FDI 100 – Scenario 2



Calculated December 7, 2025, 12:58 pm (MDc v.4.9)

FDI 100 DSF Max Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	3.84 km/h
Vegetation Classification	Forest	Flame length	28.1 m
Understorey fuel load	14 t/ha	Flame angle	52 °, 61 °, 68 °, 72 °, 74 ° & 82 °
Total fuel load	25.9 t/ha	Elevation of receiver	9.91 m, 10.77 m, 10.93 m, 10.57 m, 10.29 m & 6.96 m
Vegetation height	n/a	Fire intensity	51,453 kW/m
Effective slope	12 °	Transmissivity	0.852, 0.825, 0.794, 0.769, 0.758 & 0.703
Site slope	3 °	Viewfactor	0.6166, 0.4614, 0.3137, 0.2134, 0.1733 & 0.0467
Flame width	100 m	Minimum distance to < 40 kW/m ²	22 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	28.8 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	39.9 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m ²	53.2 m
		Minimum distance to < 10 kW/m ²	61.3 m

DSF FDI 100 – Scenario 3



Calculated December 7, 2025, 1:00 pm (MDc v.4.9)

FDI 100 DSF SFPP Av Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	2.54 km/h
Vegetation Classification	Forest	Flame length	19.62 m
Understorey fuel load	14 t/ha	Flame angle	65 °, 71 °, 75 °, 78 °, 79 ° & 85 °
Total fuel load	25.9 t/ha	Elevation of receiver	7.72 m, 7.74 m, 7.35 m, 6.76 m, 6.36 m & 2.69 m
Vegetation height	n/a	Fire intensity	34,010 kW/m
Effective slope	6 °	Transmissivity	0.844, 0.823, 0.797, 0.775, 0.765 & 0.712
Site slope	3 °	Viewfactor	0.423, 0.3151, 0.213, 0.1441, 0.1168 & 0.0314
Flame width	100 m	Minimum distance to < 40 kW/m ²	22.3 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	29.2 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	40.5 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m ²	54.1 m
		Minimum distance to < 10 kW/m ²	62.4 m

DSF FDI 100 – Scenario 4



Calculated December 7, 2025, 1:03 pm (MDc v.4.9)

FDI 100 DSF SFPP Max Slope

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	3.84 km/h
Vegetation Classification	Forest	Flame length	28.1 m
Understorey fuel load	14 t/ha	Flame angle	63 °, 67 °, 72 °, 75 °, 76 ° & 84 °
Total fuel load	25.9 t/ha	Elevation of receiver	10.91 m, 10.88 m, 10.61 m, 9.99 m, 9.550000000000001 m & 5.48 m
Vegetation height	n/a	Fire intensity	51,453 kW/m
Effective slope	12 °	Transmissivity	0.827, 0.806, 0.78, 0.76, 0.751 & 0.696
Site slope	3 °	Viewfactor	0.4309, 0.3218, 0.2174, 0.1467, 0.1188 & 0.0321
Flame width	100 m	Minimum distance to < 40 kW/m²	30.6 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	39.1 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	52.5 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	68.3 m
		Minimum distance to < 10 kW/m²	77.8 m

Appendix B – Strategic-level APZs

THURGOONA WIRLINGA BFSS

ASSET PROTECTION ZONES

LEGEND

Asset Protection Zones

Distance (m)



Study Area Boundary

Conservation Zoned Land

Site specific APZs required

Notes:

- Land use zoning per 2025 Structure Plan.
- The APZs identified are to be read in conjunction with the Bush Fire Strategic Study for the Thurgoona Wirlinga Precinct prepared by Meridian Urban and dated February 2026.
- The APZs identified are provided for strategic planning purposes only, and are not appropriate for use for development assessment purposes. Further detailed, site-specific assessment is required to inform APZ requirements as part of any future subdivision application.
- The APZs identified are measured from the edge of hazard and may comprise areas of parkland, managed gardens, roads, and private properties. Rehabilitation or identified hazard may alter the extent of hazard into the future and this is to identified via site-specific assessment conducted by a qualified and experienced bush fire practitioner.
- The APZs identified comply with the APZ widths outlined for residential subdivisions at FDDI 80, as prescribed by Planning for Bush Fire Protection 2019.
- It is acknowledged that SFPP activities will occur within the Precinct. APZs for these specific uses cannot be identified at the strategic planning stage, as their specific locations are not yet identified. Future bush fire hazard assessments will be required to ensure sufficient separation is provided to achieve a maximum radiant heat flux exposure of 10kW/m² using 1,200K flame temperature.
- Land already zoned in the Precinct which is not proposed to change as part of the Planning Proposal is not included within this map set.
- Inner and Outer Protection Zones (which together, form the APZ) are as per the provisions of Table A1.12.4 of PBP 2019. It is noted that Inner and Outer Protection Zones do not apply to grassland hazard per PBP 2019.



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THURGOONA WIRLINGA BFSS

ASSET PROTECTION ZONES

LEGEND

Asset Protection Zones

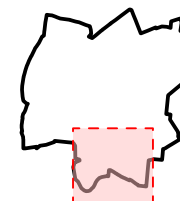
Distance (m)

- 14m
- 25m (IPZ)
- 25m (OPZ)
- 39m (IPZ)
- 39m (OPZ)

Zones

Class Name

- U - C4 Enviornment Living
- U - Drainage Basins updated to DA's
- U-Structure Plan-Special Activities
- U - R5 Interface
- U - E3 Urban Services
- U-Structure Plan-Neighbourhood Centre_Commercial
- U-Structure Plan-Village Centre_Commercial
- U-Structure Plan-Village Centre_Residential
- U - R5 Large Lot
- U -General Residential
- U-Structure Plan-General Residential
- U - MNC Resi
- U -Structure Plan-Special Activities
- U-Conservation-Conservation Zoning
- U-Parks-02 Existing Park in Study Area
- U-Parks-04 Proposed SP Park-A_District SG
- U-Parks-04 Proposed SP Park-B_Local SG
- U-Parks-04 Proposed SP Park-C_District Park
- U-Parks-04 Proposed SP Park-D_Local RP
- U-Parks-04 Proposed SP Park-E_Local Linear Park
- U-Parks-04 Proposed SP Park-F_Golf
- U-Structure Plan-Education
- Study Area Boundary
- Conservation Zoned Land
- Site specific APZs required



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0 0.4 0.8 km

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THURGOONA WIRLINGA BFSS

ASSET PROTECTION ZONES

LEGEND

Asset Protection Zones

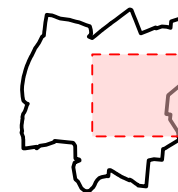
Distance (m)

- 14m
- 25m (IPZ)
- 25m (OPZ)
- 39m (IPZ)
- 39m (OPZ)

Zones

Class Name

- U - C4 Envirnmental Living
- U - Drainage Basins updated to DA's
- U-Structure Plan-Special Activities
- U - R5 Interface
- U - E3 Urban Services
- U-Structure Plan-Neighbourhood Centre_Commercial
- U-Structure Plan-Village Centre_Commercial
- U-Structure Plan-Village Centre_Residential
- U - R5 Large Lot
- U -General Residential
- U-Structure Plan-General Residential
- U - MNC Resi
- U -Structure Plan-Special Activities
- U-Conservation-Conservation Zoning
- U-Parks-02 Existing Park in Study Area
- U-Parks-04 Proposed SP Park-A_District SG
- U-Parks-04 Proposed SP Park-B_Local SG
- U-Parks-04 Proposed SP Park-C_District Park
- U-Parks-04 Proposed SP Park-D_Local RP
- U-Parks-04 Proposed SP Park-E_Local Linear Park
- U-Parks-04 Proposed SP Park-F_Golf
- U-Structure Plan-Education
- Study Area Boundary
- Conservation Zoned Land
- Site specific APZs required



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0 0.5 1 km

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THURGOONA WIRLINGA BFSS

ASSET PROTECTION ZONES

LEGEND

Asset Protection Zones

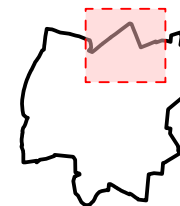
Distance (m)

- 14m
- 25m (IPZ)
- 25m (OPZ)
- 39m (IPZ)
- 39m (OPZ)

Zones

Class Name

- U - C4 Enviornment Living
- U - Drainage Basins updated to DA's
- U-Structure Plan-Special Activities
- U - R5 Interface
- U - E3 Urban Services
- U-Structure Plan-Neighbourhood Centre_Commercial
- U-Structure Plan-Village Centre_Commercial
- U-Structure Plan-Village Centre_Residential
- U - R5 Large Lot
- U -General Residential
- U-Structure Plan-General Residential
- U - MNC Resi
- U -Structure Plan-Special Activities
- U-Conservation-Conservation Zoning
- U-Parks-02 Existing Park in Study Area
- U-Parks-04 Proposed SP Park-A_District SG
- U-Parks-04 Proposed SP Park-B_Local SG
- U-Parks-04 Proposed SP Park-C_District Park
- U-Parks-04 Proposed SP Park-D_Local RP
- U-Parks-04 Proposed SP Park-E_Local Linear Park
- U-Parks-04 Proposed SP Park-F_Golf
- U-Structure Plan-Education
- Study Area Boundary
- Conservation Zoned Land
- Site specific APZs required



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0 0.4 0.8 km

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THURGOONA WIRLINGA BFSS

ASSET PROTECTION ZONES

LEGEND

Asset Protection Zones

Distance (m)

14m

25m (IPZ)

25m (OPZ)

39m (IPZ)

39m (OPZ)

Zones

Class Name

U - C4 Enviornmental Living

U - Drainage Basins updated to DA's

U-Structure Plan-Special Activities

U - R5 Interface

U - E3 Urban Services

U-Structure Plan-Neighbourhood Centre_Commercial

U-Structure Plan-Village Centre_Commercial

U-Structure Plan-Village Centre_Residential

U - R5 Large Lot

U -General Residential

U-Structure Plan-General Residential

U - MNC Resi

U -Structure Plan-Special Activities

U-Conservation-Conservation Zoning

U-Parks-02 Existing Park in Study Area

U-Parks-04 Proposed SP Park-A_District SG

U-Parks-04 Proposed SP Park-B_Local SG

U-Parks-04 Proposed SP Park-C_District Park

U-Parks-04 Proposed SP Park-D_Local RP

U-Parks-04 Proposed SP Park-E_Local Linear Park

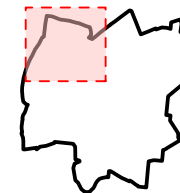
U-Parks-04 Proposed SP Park-F_Golf

U-Structure Plan-Education

Study Area Boundary

Conservation Zoned Land

Site specific APZs required



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0 0.4 0.8 km

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