MORPHUM environmental

Co-creating a thriving ecosystem

Civil Infrastructure Analysis

Growing Places Strategy

Final Rev A

Prepared for Golden Plains Shire Council

Document Control

Client Name: Golden Plains Shire Council

Project Name: Civil Infrastructure Analysis

Project Number: P03930

Document: Growing Places Strategy

Revision History

Status	Date Issued (dd/mm/yyyy)	Author	Reviewed By	Released By
Draft	21/09/2023	Jessi Raj	Dave Cox	Stu Joyce
Draft v2	21/03/2024	Jessi Raj	Dave Cox	Dave Cox
Final	30/05/2024	Jessi Raj and Gillian Boucher	Dave Cox	Dave Cox
Final Rev A	10/07/2024	Jessi Raj and Gillian Boucher	Dave Cox	Dave Cox

Reviewed by:

Reviewer: Dave Cox **Signature:** 

Released by:

Reviewer: Stuart Joyce **Signature:** 

Executive Summary

Background

Golden Plains Shire Council (GPSC) is developing a shire-wide housing strategy, the Growing Places Strategy. Various factors have been considered in the process to date, resulting in the identification of five strategic townships (Figure 1) where residential growth is considered most appropriate over at least the next 15 years. The initial analysis also identified the optimal land parcels in each township to achieve the projected growth.

Morphum Environmental Ltd (Morphum) was engaged by GPSC to further refine the prioritisation of where to focus residential growth via a service limitation and civil infrastructure analysis. . A multi criteria assessment (MCA) model was developed to analyse opportunities to deliver more sustainable outcomes in terms of both infrastructure options, and the well-being of the people who will live in these areas.

The model integrates both aspects in generating a comparison between the five townships to support phasing of growth across the townships. The model also provides for prioritisation across the optimal parcels within each of the five townships. Table 1 summarises the number of parcels included in the analysis for each township.

Table 1 Breakdown of Parcels within Each Township

Township	Number of Parcels of Interest
Stonehaven	20
Cambrian Hill	28
Teesdale	90
Meredith	29
Lethbridge	39

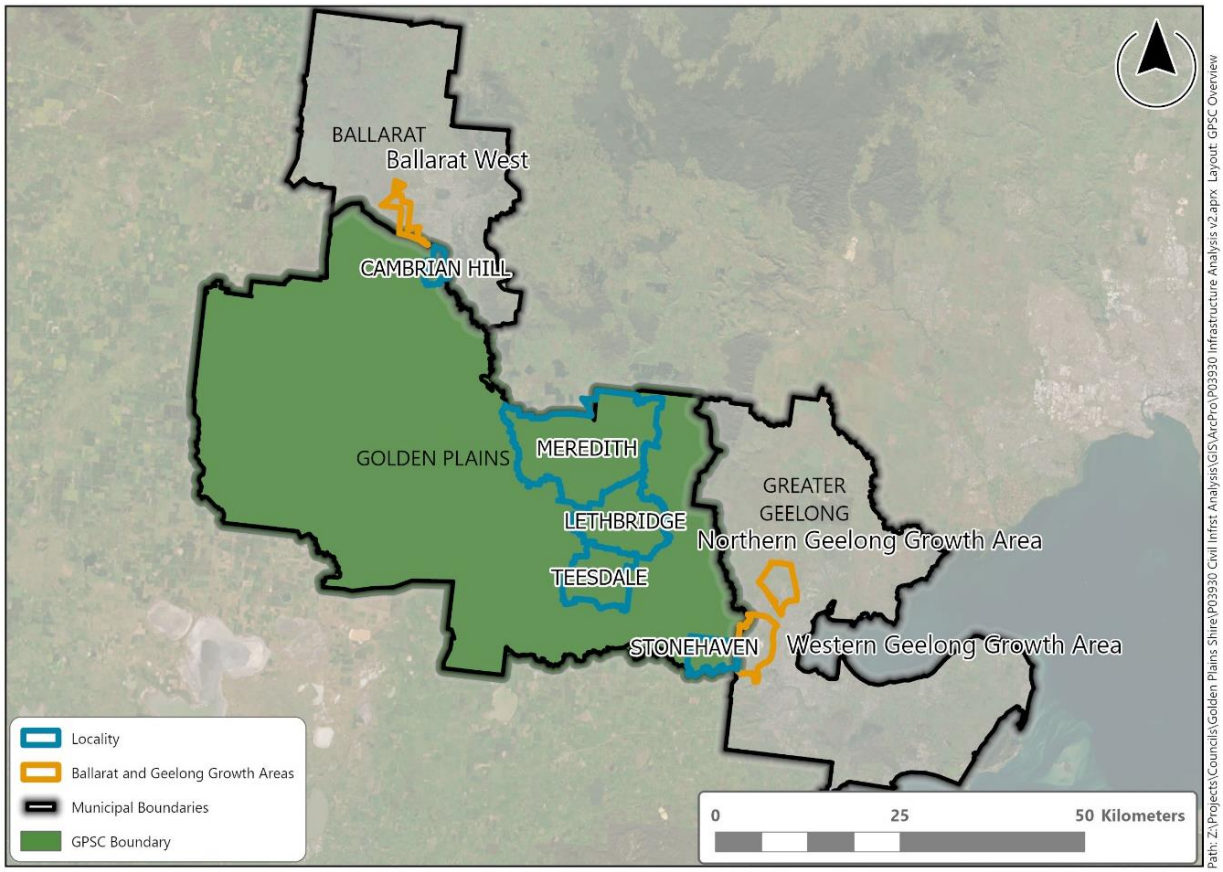


Figure 1 Map showing location of the five townships within the Shire in relation to the major regional centres of Geelong and Ballarat.

The outputs of the analysis are spatial in nature. A GIS web map has been created to provide visual and spatial representation for the findings of this report, which is accessible via a separate online platform (https://experience.arcgis.com/experience)[1].

The report outlines the approach and methods applied in developing the MCA model, undertaking the analysis, the assumptions and limitations, and presents the overall results. The online platform enables the review of the underlying data, analysis of individual services, infrastructure types and sustainability factors, and the outputs from the cumulative analysis of the individual elements.

The Growing Places Strategy is one of Council's policies that aim to give effect to 'Golden Plains Shire Community Vision 2040. The 2040 Vision was developed through broad engagement with the Golden Plans community who identified supporting vision statements under the themes: Community, Liveability, Sustainability and Prosperity for delivery by 2040. This analysis concludes with a guidance document (Appendix 2) to support development of these growth areas in line with the vision under each theme. Existing council and sector best practice guidance is integrated into this guidance.

[1] Username: GoldenShire_Morphum Password: m0rphUm%GPS

Approach and Method

The approach to and methods employed in undertaking the assessment are summarised as follows:

1. Data Selection

GPSC provided the most appropriate data to represent the type and spatial location of different services, infrastructure types and sustainability factors, that were integrated into the assessment.

2. Development of draft Multi Criteria Analysis (MCA) Model

The MCA model structure is shown below in Figure 2. It involves analysis for the individual infrastructure, service and suitability elements. A cumulative score is then generated for:

1. Infrastructure and services, and
2. Sustainability elements.

The final step involved combining the total score for the above two in deriving a total suitability score. A normal distribution model was used to categorise the final scores across four score categories.

Figure 2 Structure of the MCA model

3. Workshop

The accuracy of the model outputs is reliant on the integration of local planning policy, guidance, standards, and understanding of these held by GPSC staff. As the model represents a new planning tool, it is important that GPSC understand and have confidence in it. The draft MCA model structure was therefore presented to GPSC staff in a workshop on 20th July 2023 to:

- Test the structure and rationale underpinning the assessment,
- Address issues with data provided, and
- Confirm an approach and structure for GPSC staff to confirm the thresholds to inform the scoring for each of the elements and weighting assigned to each.

4. Definition of Constraint Thresholds and Weighting

GPSC staff went through a process, post the workshop, to refine the thresholds and weighting for the individual elements.

5. Draft MCA and Report

The model was populated with the thresholds and weightings feedback and run to generate the individual and overall scoring. The online platform was established to enable access and spatial understanding of the baseline layers and the cumulative MCA scores, with this report summarizing the model development method and outputs.

Assumptions and Limitations

The model outputs should be considered with the following assumptions and limitations in mind:

- Data: There are some key data limitations that have become evident during the course of the analysis which have restricted the accuracy of some of the outputs across this assessment. Examples of this limitation include:
    - Multiple datasets with inconsistent naming conventions of key data attributes can lead to the risk of data omissions when these are consolidated to run the model. To mitigate any risks of omissions the datasets used for the model have been QAed by a project engineer and a GIS analyst.
    - The MCA model is sensitive to the location accuracy and resolution of the datasets. To address this occurrence from influencing the scores, a 5m buffer was applied to all indicators feature classes.

The scoring and weightings used in the MCA model were workshopped with Council and ultimately, the resultant values were based on GPSC priorities of infrastructure assets.

Outcomes and Recommendations

The findings of the infrastructure and sustainability analysis are presented in Table 2 and Table 3. Table 2 demonstrates the scoring categorisation across the parcels within each township and Table 3 depicts the average MCA scores for each township. Details on the scoring and the distinction between the categories can be found in Section 2.2.2, noting here that Category 4 is least suitable, and Category 1 is the most suitable.

The key outcomes of the analysis are:

- Meredith has emerged as the most suitable township for residential growth from an infrastructure perspective as it had the highest average infrastructure score. This is because infrastructure requirements (via upgrades or expansion) to service the proposed growth areas within Meredith are likely to be less complex and cheaper.
- Meredith has also had the highest average sustainability score. It is therefore likely that growth areas within Meredith will likely secure more sustainable outcomes from a social and environmental perspective.
- Overall, Meredith had the highest average MCA score.

Table 2 Distribution of Parcels (%) For Each Score Category from the Infrastructure and Sustainability Analysis[1]

Township	Aspect	Category 4	Category 3	Category 2	Category 1
Cambrian Hill	Infrastructure score	9%	9%	12%	70%
	Sustainability score	0%	34%	66%	0%
	Total MCA Score	9%	11%	25%	55%
Lethbridge	Infrastructure score	0%	45%	42%	13%
	Sustainability score	18%	53%	17%	12%
	Total MCA Score	0%	52%	34%	14%
Meredith	Infrastructure score	9%	9%	13%	69%
	Sustainability score	1%	0%	9%	89%
	Total MCA Score	0%	1%	23%	76%
Stonehaven	Infrastructure score	14%	33%	19%	34%
	Sustainability score	21%	79%	0%	0%
	Total MCA Score	14%	46%	40%	0%
Teesdale	Infrastructure score	10%	32%	37%	20%
	Sustainability score	6%	80%	14%	0%
	Total MCA Score	13%	49%	37%	1%

1 Refer to Section 2.2.2, for a description of the categories.

Table 3 Summary of Infrastructure and Sustainability Analysis for Each Township

Locality	Average Infrastructure Scoring	Average Sustainability Scoring	Average MCA
Meredith	111.3	193.7	305.0
Lethbridge	103.1	174.2	277.3
Cambrian Hill	90.9	167.5	258.4
Stonehaven	98.0	140.9	238.9
Teesdale	62.4	164.6	226.9

Contents

Tables

1. Introduction

1.1. Background

Golden Plains Shire Council (GPSC) is developing a shire-wide housing strategy, the Growing Places Strategy. Various factors have been considered in the process to date, resulting in the identification of five strategic townships (Figure 3) where residential growth is considered most appropriate over at least the next 15 years. Initial assessments undertaken previously (such as those listed below), have identified the areas in each township where residential growth is more appropriate based on the findings of the below assessments.

- Strategic Bushfire Risk Assessment;
- Housing Needs Assessment;
- Natural Environment and Hazards Analysis;
- Characteristics and Comparative Significance Analysis;
- Industrial Land Supply Analysis; and a
- First Peoples Cultural Heritage Report.

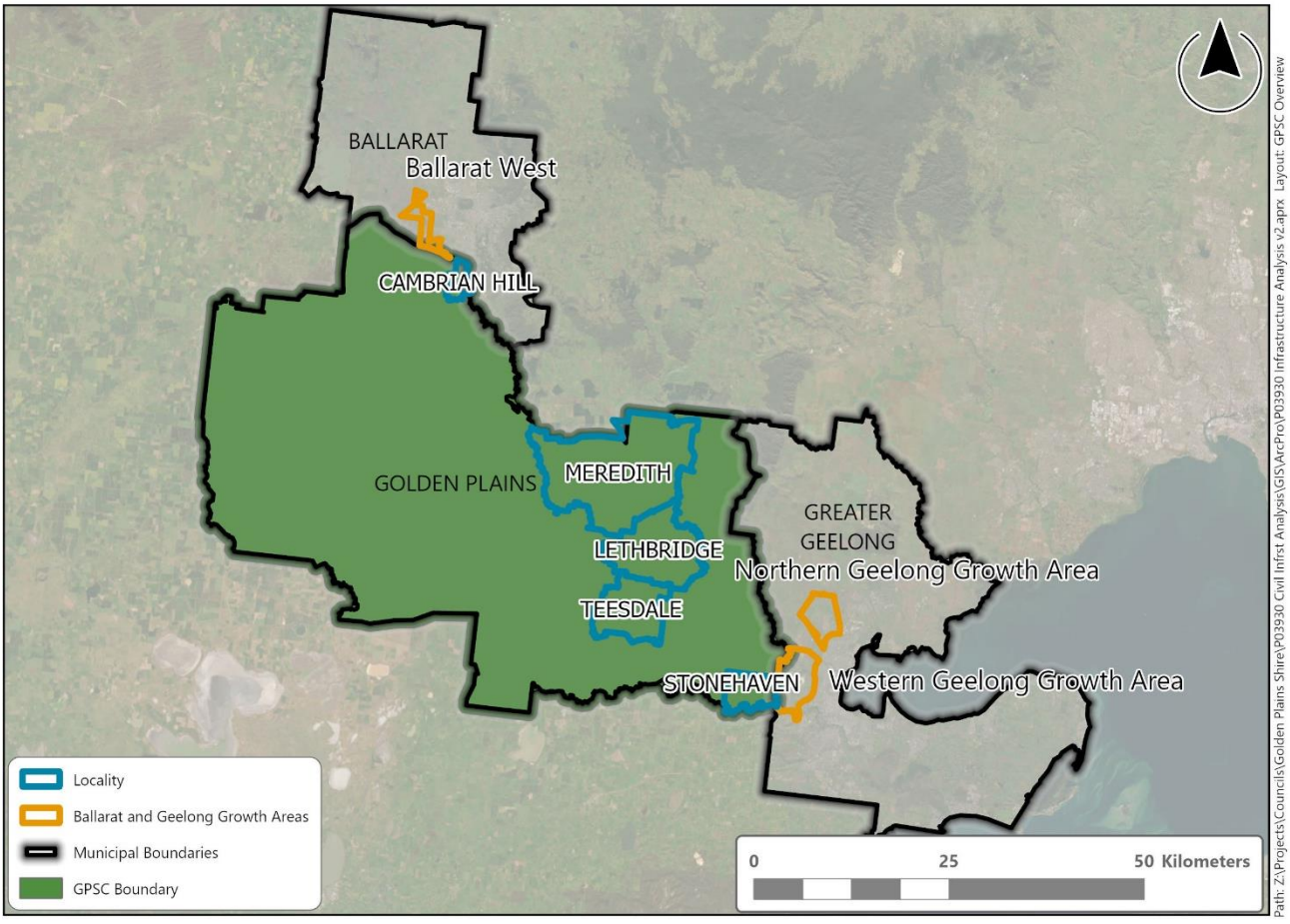


Figure 3 Map showing location of the five townships within the Shire in relation to the major regional centres of Geelong and Ballarat.

1.2. Objectives

The objective of this analysis was to support prioritisation of where to focus residential growth - between and within the five settlements. The secondary objective was to provide guidance to support the sustainable planning and development of residential projects in these areas in line with the community vision and aspirations.

1.3. Scope

Morphum Environmental Ltd. (Morphum) was engaged by GPSC to undertake this service limitation and civil infrastructure analysis to further refine the prioritisation of residential growth within the five townships in Figure 3. This assessment also integrates opportunities to deliver more sustainable outcomes in terms of infrastructure options, as well as the well-being of the people who will live in these areas. This report summarises the findings of this assessment.

As mentioned, the areas that have been identified as having potential for future residential growth from the previous investigations are listed in section 1.1. These have been broken down into parcels of interest (POI) selected by GPSC for analysis purposes. Table 4 summarises the number of parcels of interest within each of the townships.

Table 4 Breakdown of Parcels within Each Township

Township	Number of Parcels of Interest
Stonehaven	20
Cambrian Hill	28
Teesdale	90
Meredith	29
Lethbridge	39

The following sub sections provide a visual representation of each township and the POIs within each.

1.3.1. Cambrian Hill

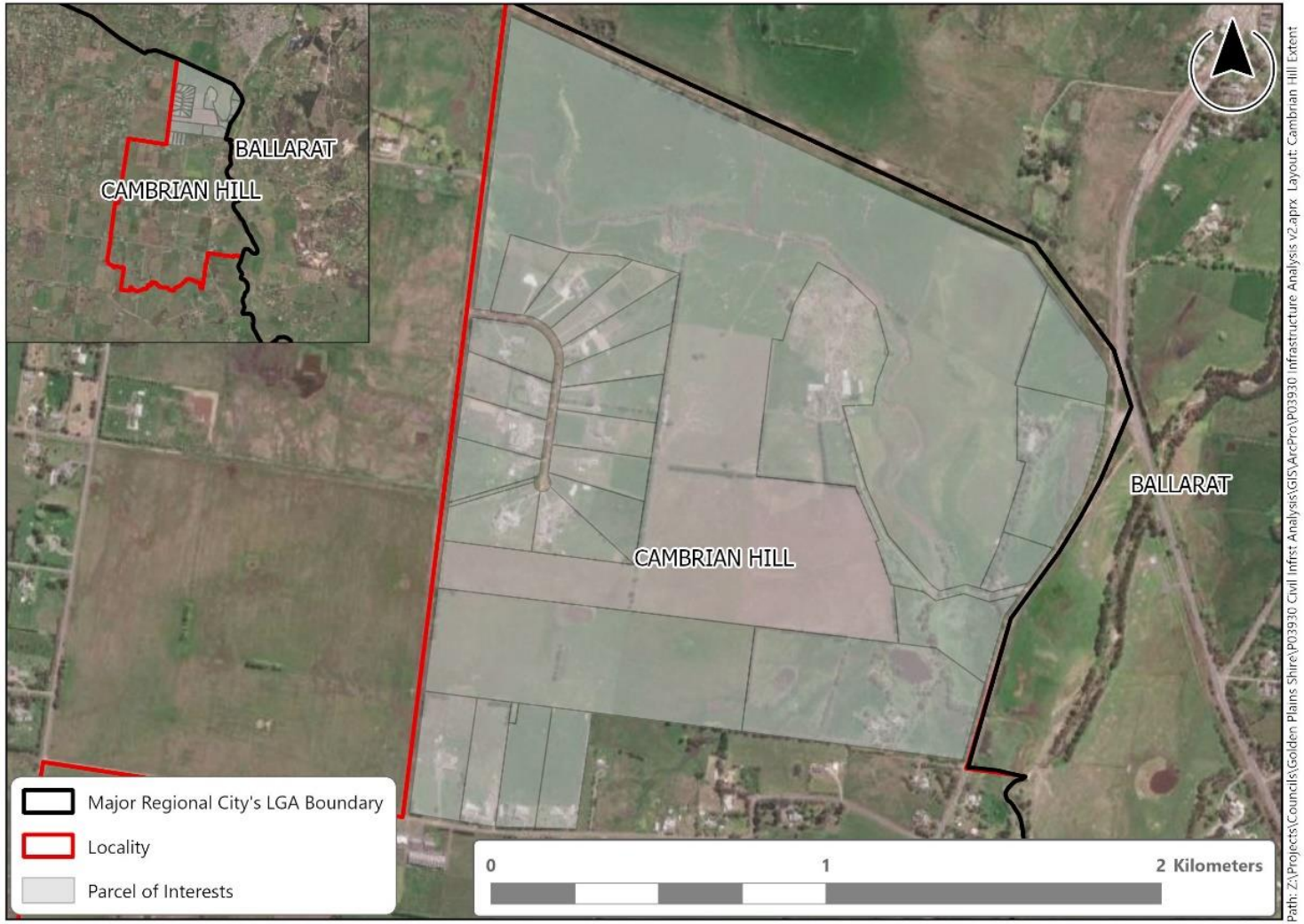


Figure 4 Parcels of Interest within Cambrian Hill for MCA Analysis

1.3.2. Lethbridge

Figure 5 Parcels of Interest within Lethbridge for MCA Analysis

1.3.3. Meredith

Figure 6 Parcels of Interest within Meredith for MCA Analysis

1.3.4. Stonehaven (adjoining the Western Geelong Growth Area)

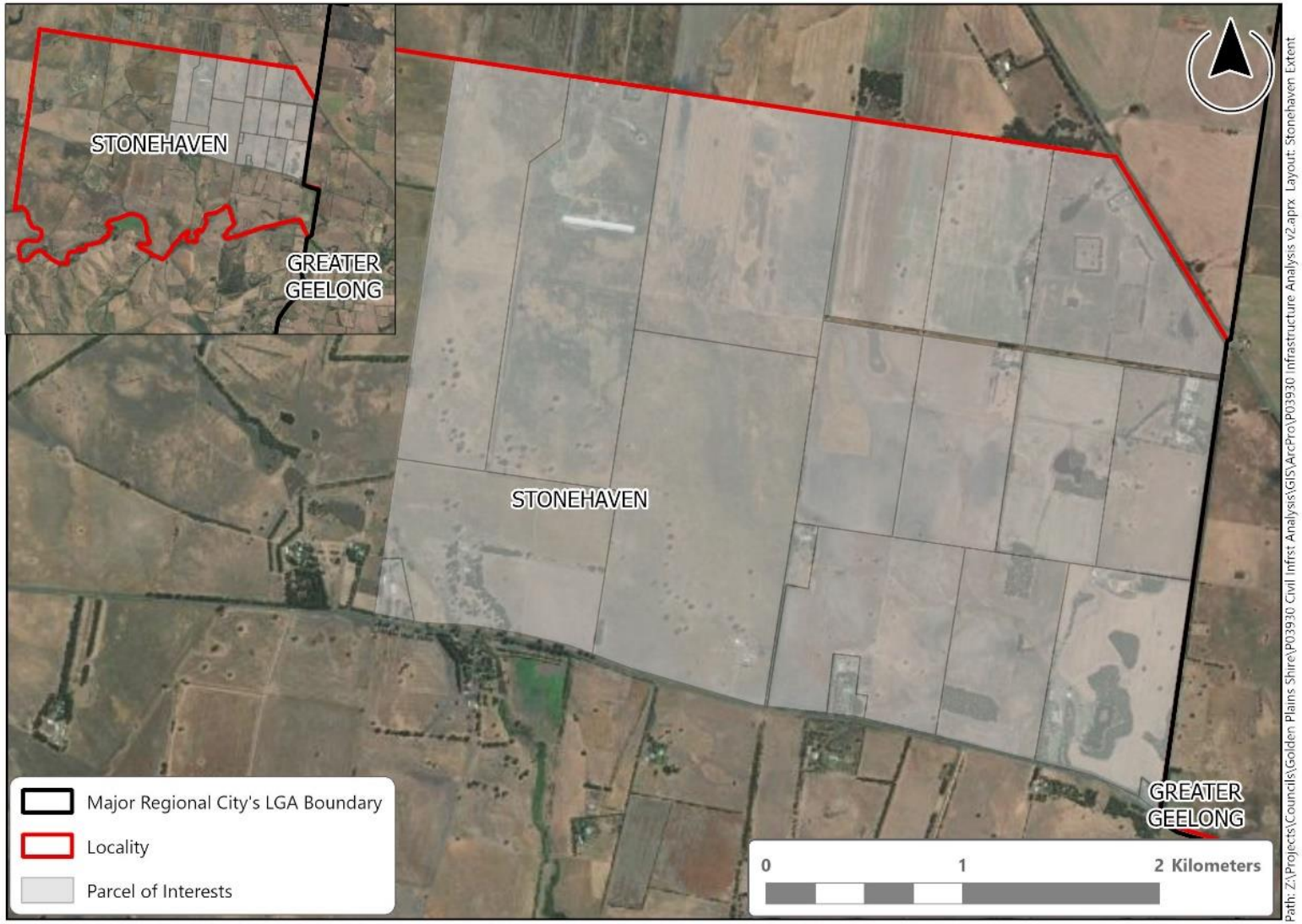


Figure 7 Parcels of Interest within Stonehaven for MCA Analysis

1.3.5. Teesdale

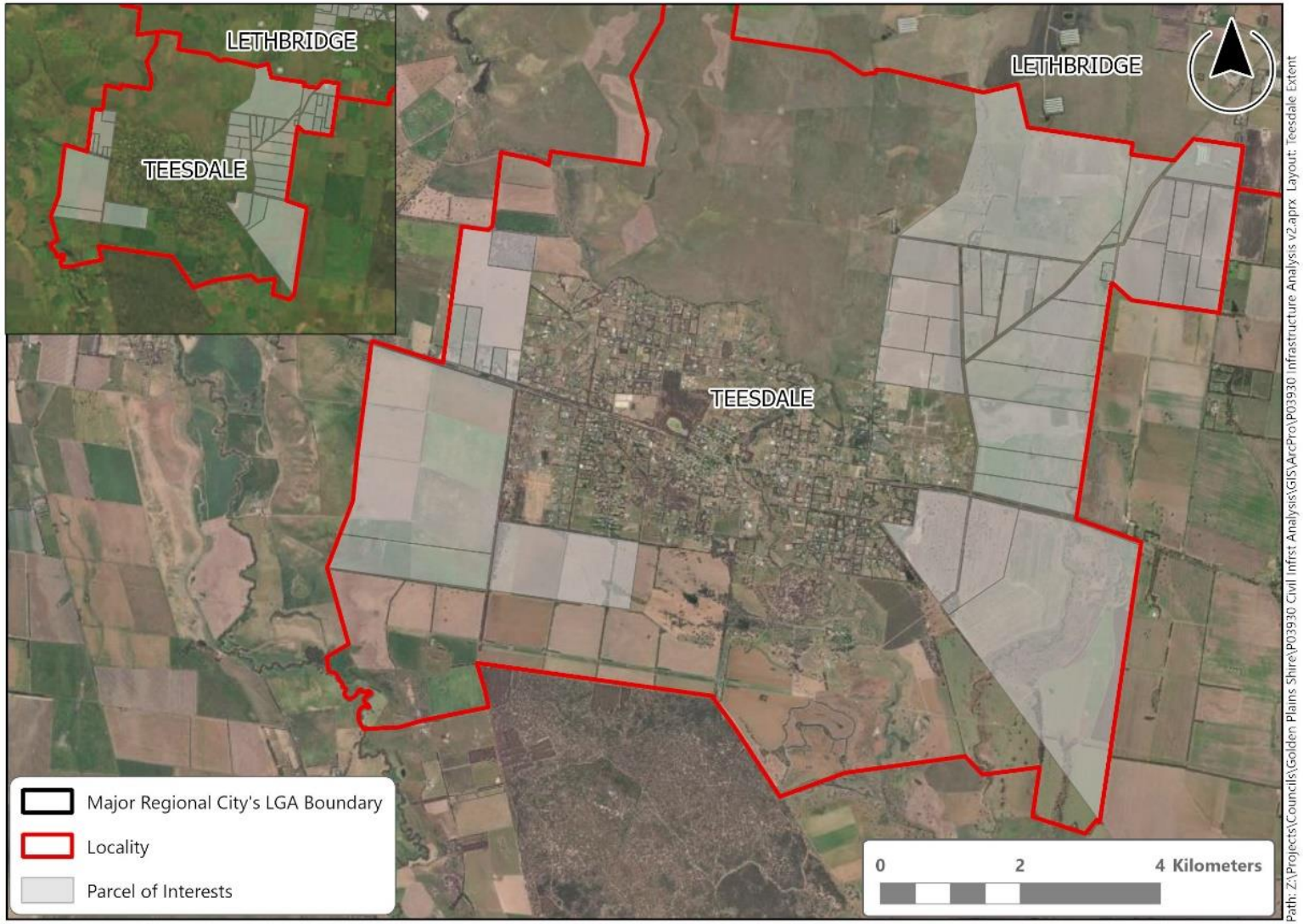


Figure 8 Parcels of Interest within Teesdale for MCA Analysis

2. Methodology

The project utilised a number of spatial datasets provided by Council as the basis of the civil infrastructure analysis and prioritisation of future housing locations. Section 2.1 details the datasets that were used in developing the multi-criteria analysis (MCA) model. Section 2.2 details the process to develop the civil infrastructure analysis. Section 2.3 and 2.4 consists of assumptions and limitations of the analysis.

2.1. Dataset Used

The following datasets were used for the multi-criteria analysis (MCA) model. An initial model was developed in October 2023. The model was revised in February 2024 to include additional datasets outside the Golden Plains Shire locality that may impact the scoring of those parcels close to the Shire boundary. The model was then recalibrated to incorporate the weighting and scorings to better reflect Council's current priorities and drivers.

Table 5 MCA Model Data Inputs

Criteria	Dataset Name	Source	Date Received
Locality	Locality	GPSC	14/02/2023
Parcels	Parcel	Department of Energy, Environment and Climate Action (DEECA) via Victorian Government Open Data Platform	12/05/2023
Civil and Utilities Infrastructure			
Road	TR_ROAD	GPSC	11/12/2023
	Principal Bicycle Network	GPSC	15/08/2023
Train	GNR and Rail	GPSC	11/12/2023
Bus Route	PTV_REGIONAL_BUS_ROUTE	Public Transport Victoria	11/12/2023
	PTV_REGIONAL_BUS_STOP	Public Transport Victoria	11/12/2023
Mains	BW Water Mains	Barwon Water	11/12/2023
	CHW Water Mains	Central Highlands Water	11/12/2023
Power	Low Voltage Lines	GPSC	11/12/2023
	High Voltage Lines	GPSC	11/12/2023
SW network	SW Pipes	GPSC	17/03/2023
Wastewater Network	CHW Sewer Pipe	Central Highlands Water	11/12/2023
	BW Sewer Pipe	Barwon Water	11/12/2023
Sustainability			

Criteria	Dataset Name	Source	Date Received
Community services	GNR and FOI_Index_Extent,	GPSC	18/08/2023
	GNR and FOI_Index_Extent,	GPSC	11/12/2023
	GNR and FOI_Index_Extent,	GPSC	11/12/2023
	FOI_Index_Extent,	GPSC	11/12/2023
Parks	GNR and FOI_Index_Extent,	GPSC	11/12/2023
	FOI_Index_Extent,	GPSC	11/12/2023
Renewables	Windfarms	GPSC	14/02/2023
	Renewables		11/12/2023
Sensitive Areas	NVR2017_LOCATION.tif	GPSC	21/09/2023
Cultural Sensitive Areas	CultutalSensitiveAreas	GPSC	11/12/2023
Waterways and WSUD devices	HY_WATERCOURSE and WETLAND_CURRENT	GPSC	11/12/2023
Economic	Built up Area Regional greenfield residential land Additional growth area	GPSC	11/12/2023
Climate change resilience	Layer Name: Tree100	GPSC	11/12/2023

2.2. Method

The approach to and methods employed in undertaking the service limitation and civil infrastructure analysis are as follows:

2.2.1. Data Selection

GPSC provided the most appropriate data to represent the type and spatial location of the different services, infrastructure types and sustainability factors. An examination of existing utility services strategies and requirements was undertaken for the following utility services asset types:

- Water
- Sewer
- Recycled Water
- Drainage
- Roads
- Waste
- Electricity
- Use of major electricity easements through the site
- Potential for alternative energy sources
- Gas

An analysis was then undertaken to identify the distribution and accessibility to these assets for each township.

2.2.2. Development of draft MCA Model

A Multi-Criteria Analysis (MCA) model is a decision-making method that systematically evaluates and prioritises alternatives by considering multiple criteria. The process to develop an MCA model for this analysis involved identifying and weighting relevant criteria, assessing each townships performance against the criteria, normalizing scores, calculating weighted scores, and aggregating results to rank each township.

This MCA approach enables a comprehensive and transparent evaluation, considering the relative importance of different criteria in the decision-making process. In this case, he final rankings will inform Council residential growth decisions.

To identify the preferred growth areas involved undertaking an opportunities and constraints assessment for each of the service and utilities components through the MCA model structure (shown below in Figure 9) using the indicators in Table 6.

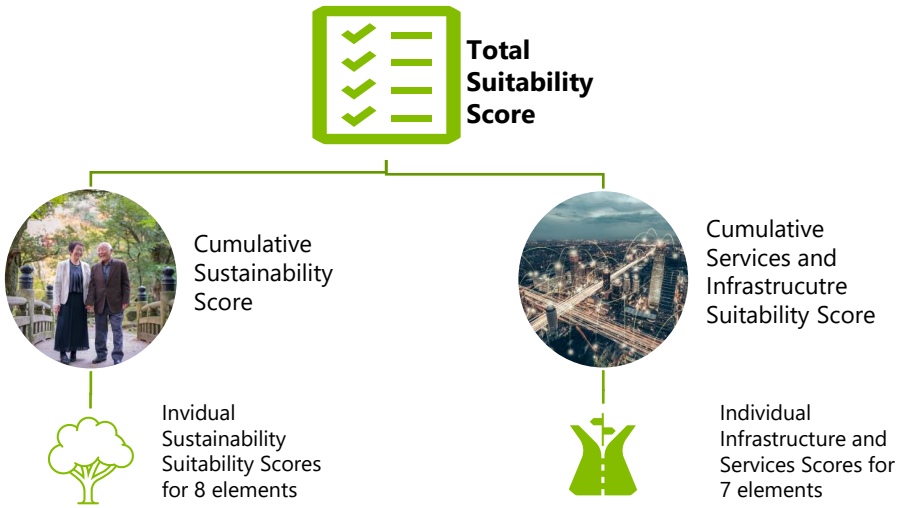


Figure 9: Structure of the MCA model

Table 6: Indicators for the MCA Scoring Model

Focus Value	Indicator
Civil Infrastructure and Utility Services	Proximity to existing roads
	Proximity to existing bicycle network
	Proximity to existing public transport services
	Accessibility to existing water mains
	Accessibility to stormwater network
	Proximity to sewage network
	Accessibility to existing power supply
Sustainability	Ecology and Biodiversity
	Accessibility to education
	Safety, Health and Well being
	Cost
	Aboriginal cultural heritage sensitivity
	Bicycle Horizontal/ Vertical Alignment
	Socioeconomic value
	Climate change resilience

The framework of the MCA was developed and agreed with Council in following workshop on 20th July 2023. A visual representation of the model can be found in Appendix 1.

An individual score for each parcel was calculated for the indicators in Table 4 and then a weighting was applied to generate the following three scores for each POI.

- Sustainability score;
- Infrastructure score; and
- Total MCA score (sum of Sustainability and Infrastructure scores).

A total score was calculated for each township by averaging the POI scores, across each township.

All three scores for each POI were categorised using the below normal distribution method (See Figure 10) provides a definition of the resulting score categories.

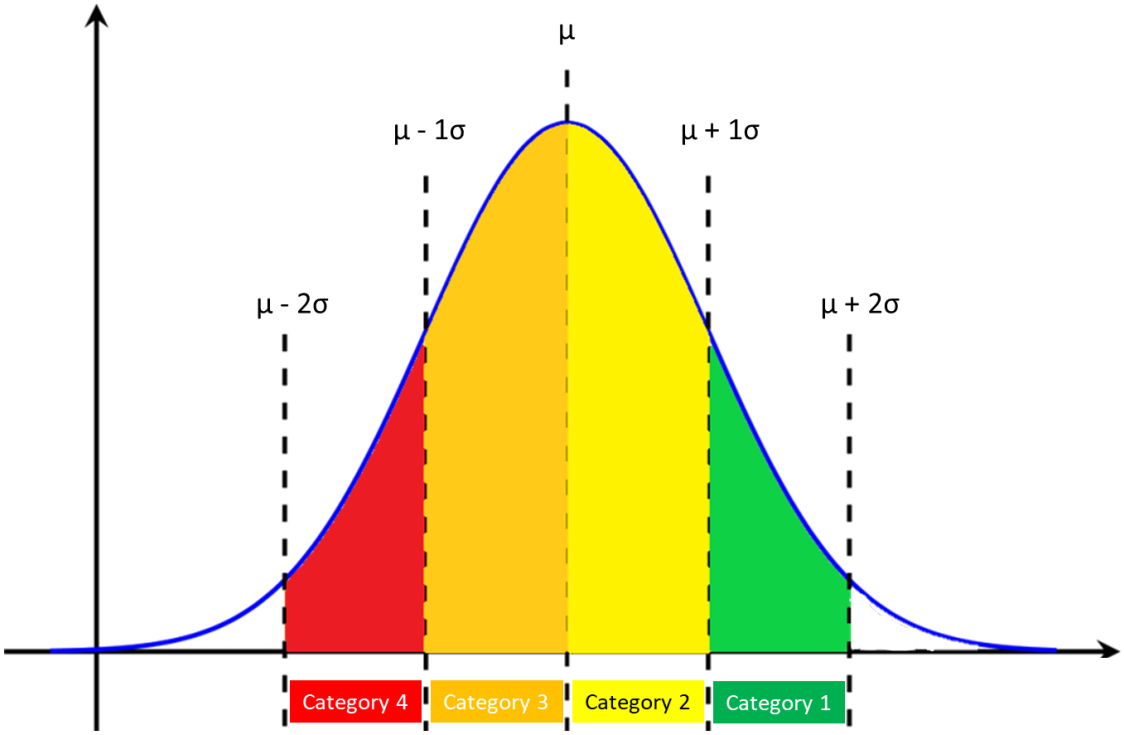


Figure 10 Schematic Illustrating Normal Distribution of MCA Scoring to Determine Score Categories

Table 7: Opportunities and Constraints Scoring Categories

Opportunities		**Constraints**	
Category	**Description**	**Category**	**Description**
1	Parcels in this category scored in the upper quartile of scores using Figure 10. Proximity to existing infrastructure will increase accessibility, reduce complexity and costs for any upgrades or expansions to potential growth areas.	**3**	This level will highlight POI that are constrained for development but not as constrained as POIs with a Category 4 scoring. Due to the distance to existing infrastructure, cost and complexity for any upgrades or expansions to potential growth areas is likely to increase.
2	This level highlights the next quartile of scores, after the Category 1 POIs. Proximity to existing infrastructure will slightly increase accessibility, slightly reduce complexity and costs for any upgrades or expansions to potential growth areas.	**4**	Parcels in this category scored the bottom quartile of scores, as per Figure 10. Due to the distance to existing infrastructure, cost and complexity for any upgrades or expansions to potential growth areas is likely to significantly increase.

2.2.3. Workshop

The accuracy of the model outputs is reliant on the integration of local planning policy, guidance, and standards. As the model represents a new planning tool for it is important that GPSC understand and have confidence, in the model. The draft MCA model structure was therefore presented to GPSC staff to:

- Test the structure and rationale underpinning the assessment,
- Address issues with data provided, and
- Confirm an approach and structure for GPSC staff to confirm the thresholds to inform the scoring for each of the elements and weighting assigned to each.

2.2.4. Confirmation of Constraint Thresholds and Weighting

GPSC staff provided feedback post the workshop, to refine the thresholds and weighing for the individual elements .

2.2.5. Draft MCA and Report

The model was populated with the thresholds and weightings feedback and run to generate the individual and overall scoring. The online platform was established to enable access and spatial understanding of the baseline layers and the cumulative MCA scores, with this report summarising the model development method and outputs.

2.3. Assumptions

The following table provides assumptions and justifications for the weightings and scorings for the multi-criteria analysis. These were provided and agreed upon by the GPSC project team based on GPSC policies, standards, guidelines and priorities.

Indicator	Overall Weighting	Weighting Justification	Scoring				Scoring Justification
Civil and Utilities Infrastructure							
Road	5	This was given the highest weighting as it is considered to be essential for a development to have access to existing road network.	**0m proximity**	**100m proximity**	**500m proximity**	**1km proximity**	As the distance between the POIs and the existing road network increases, access, extension and connection to the network becomes more complex and costly
			10	5	2	1	
Bicycle Network	5	Council wishes to prioritise non-vehicular transport opportunities	**0m proximity**	**500m proximity**	**1km proximity**	**5km proximity**	As the distance between the POIs increases from the existing network, access, extension and connection to the network becomes more complex and costly
			10	5	2	1	
Railway stations	4	Council wishes to prioritise non-vehicular transport opportunities	**0m proximity**	**400m proximity**	**800m proximity**	**10km proximity**	A maximum distance of 800 m provides a walking distance for potential users to the train station. Anything above 800 m up to 10 km provide park and ride opportunities.
			10	10	7	5	
Bus and coach routes	4	Council wishes to prioritise non-vehicular transport opportunities	**0m proximity**	**400m proximity**	**800m proximity**	**1km proximity**	A maximum distance of 800 m provides a walking distance for potential users to the train station. Anything above 800 m is no longer considered to
			10	7	4	-1	

							be a safe walking distance (Department of Transport, 2008).
Bus and coach stations	3	Council wishes to prioritise non-vehicular transport opportunities. However, it may be more straightforward for additional bus stops to existing routes.	**0m proximity**	**400m proximity**	**800m proximity**	**1km proximity**	A maximum distance of 800 m provides a walking distance for potential users to the bus station. Anything above 800 m is no longer considered to be a safe walking distance
			10	7	4	-1	
Water mains	5	This was given the highest weighting as it is considered to be essential for a development to have access to existing potable water network.	**0m proximity**	**100m proximity**	**500m proximity**	**1km proximity**	As the distance increases from the existing network, extension and connection to the network becomes more complex and costly
			10	7	2	-1	
Low voltage network	4	Existing network is limited. Low voltage powerlines likely to be created to distribute electricity from higher voltage network to houses	**0m proximity**	**100m proximity**	**500m proximity**	**1km proximity**	As the distance increases from the existing network, extension and connection to the network becomes more complex and costly
			10	7	2	-1	
High voltage network	3	Essential for a development to have access to existing electricity network. Transformers will be required to transmit safe-for-use electricity to residential areas	**0m proximity**	**100m proximity**	**500m proximity**	**1km proximity**	As the distance increases from the existing network, extension and connection to the network becomes more complex and costly
			10	7	2	-1	
Stormwater network	5	This was given the highest weighting as it is considered to be essential for a development to have access to existing stormwater drainage network.	**0m proximity**	**100m proximity**	**500m proximity**	**1km proximity**	As the distance increases from the existing network, extension and connection to the network becomes more complex and costly
			10	7	2	-1	

Wastewater assets	3	It is considered to be essential for a development to have access to existing sewer network. However, LDRZ are not sewered and required to install onsite wastewater system for lots above 400m^2	**0m proximity**	**100m proximity**	**500m proximity**	**1km proximity**	As the distance increases from the existing network, extension and connection to the network becomes more complex and costly
			10	7	2	-1	
Sustainability							
Proximity to community service programs/ buildings	3	Likely to be built for new developments. The existing services are unlikely to be sufficient for new development	**0m proximity**	**400m proximity**	**800m proximity**	**5km proximity**	As distance increases from existing services, access to these services becomes more difficult
			10	10	7	5	
Proximity to emergency services	3	These services may be expanded to any new development	**0m proximity**	**5km proximity**	**10km proximity**	**30km proximity**	As distance increases from existing services, access to these services become more difficult
			10	10	5	1	
Access to education	5	Less likely to be expanded for new development, will have to rely on existing infrastructure	**0m proximity**	**800m proximity**	**5km proximity**	**20 km proximity**	As distance increases from existing services, access to these services become more difficult
			10	10	5	1	
Access to active open spaces	3	These spaces are likely to be provisioned for new developments. However, feasibility of these open spaces are constrained by land availability and contributing catchment sizes which is likely to be larger compared to passive open spaces.	**0m proximity**	**400m proximity**	**800m proximity**	**5km proximity**	As distance increases from existing services, access to these services become more difficult
			10	10	7	5	
Access to passive open spaces	2	These spaces are likely to be provisioned for new	**0m proximity**	**400m proximity**	**800 m proximity**	**5 km proximity**	As distance increases from existing services, access to

		developments. However, feasibility of these open spaces are constrained by land availability.	10	10	7	5	these services become more difficult
Access to renewables	2	Golden Plains Shire Council is looking to provide free energy from windfarms where feasible such as to the existing residents of Rokewood	**0m proximity**	**1 km proximity**	**5 km proximity**	**10 km proximity**	Close proximity to windfarms degrade public amenity value. However, within 5-10km, residents will have access to free and renewable energy.
			-1	-1	10	0	
Native vegetation location category	5	Building within sensitive areas will likely negatively impact existing native vegetation and lead to building restrictions	**Category 1**	**Category 2**	**Category 3**		Category 2 and 3 areas are likely to consist of endangered vegetation. Removal of less than 0.5 hectares of native vegetation could have a significant impact on habitat for a rare or threatened species.
			5	-1	-5		
Distance to areas of cultural heritage sensitivity	5	Building within area of cultural heritage sensitivity will likely negatively impact existing cultural value and lead to building restrictions	**0m proximity**	**100m proximity**	**200 m proximity**	**1 km proximity**	Unfavourable to be in close proximity to areas of cultural heritage sensitivity
			-1	2	10	10	
Distance to waterways	3	Waterways provide opportunity for residents to connect with the natural values of the land. However, areas directly abutting waterways are likely to be subjected to inundation during 1% AEP storm events	**0m proximity**	**50m proximity**	**500 m proximity**	**1 km proximity**	Up to 50 m, there is potential for developments to be inundated during flood events.
			-1	10	5	2	
Proximity to Geelong/ Ballarat growth areas	4	Access to existing towns such as Geelong and Ballarat,	**0m proximity**	**10 km proximity**	**20 km proximity**	**50 km proximity**	These proximities provide developments ease and

		provide economic and employment opportunities to new development	10	7	5	1	access to existing regional cities such as Geelong and Ballarat.
Tree cover presence	2	It's a requirement for new development to have climate change resilience such as tree cover, blue- green infrastructure and roof colour	**0m proximity**	**100m proximity**	**500 m proximity**	**1 km proximity**	Favourable for developments to have established tree cover.
			10	7	5	1	

2.4. Limitations

The model outputs should be considered with the following assumptions and limitations in mind:

- Data: There are some key data limitations that have become evident during the course of the analysis which have restricted the accuracy of some of the outputs across this assessment. Examples of this limitation include:
    - Two indicators i.e. open space scoring was obtained from multiple datasets. Some attributes that have different naming conventions might have been overlooked and omitted when merging the datasets for the MCA model. To minimise the risk of omissions the datasets used for the model have been checked by a project engineer and a GIS analyst.
    - As most of the MCA scoring is based on proximities of POI to existing infrastructure, the model outputs are limited by the accuracy of the received geospatial data. For example, where a feature class (e.g. water mains) appears to intersect with a POI when zoomed out, when zoomed in, it did not (see Figure 11). As a result, the POI did not receive the expected score (i.e. a score of 10 if a water main intersects with a POI(See Section 2.3). Realistically this POI does have direct access to this infrastructure and should be scored the highest. To address this occurrence from influencing the scores, we had increased the buffer of all indicators feature classes by 5m.

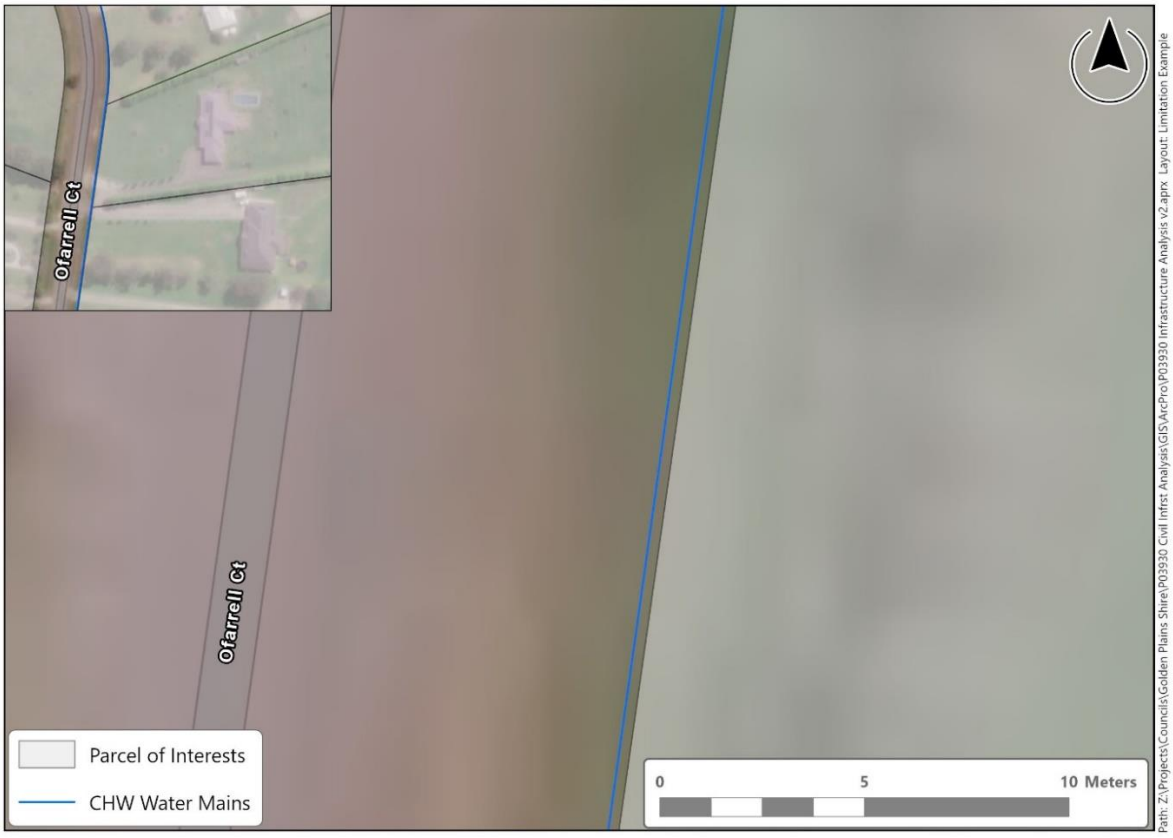


Figure 11 Map showing example of Proximity Limitation for the MCA Model. The small map on the top left corner demonstrates how the polyline appears to intersect with the edge of the POI. However, upon zooming in (as seen in the bigger map) these two feature classes do not intersect.

2.5. Online GIS Platform

A GIS web map has also been created to provide visual and spatial representation for the findings of this report, which is accessible via a separate online platform. See link web map via this link https://experience.arcgis.com/experience.

The following log in credentials provides access to the web app.

Username: GoldenShire_Morphum

Password: m0rphUm%GPS

3. Results

The outputs from the infrastructure, sustainability and total MCA analysis are provided in the following figures. Please note, Table 7 provides a definition of each score category used in the subsections below. We recommend reviewing these results with the web map open (see section 2.5 for login details) to properly understand how the scoring has been generated.

3.1. Cambrian Hill

Figure 12 below summarises the result of the MCA for each parcel within Cambrian Hill.

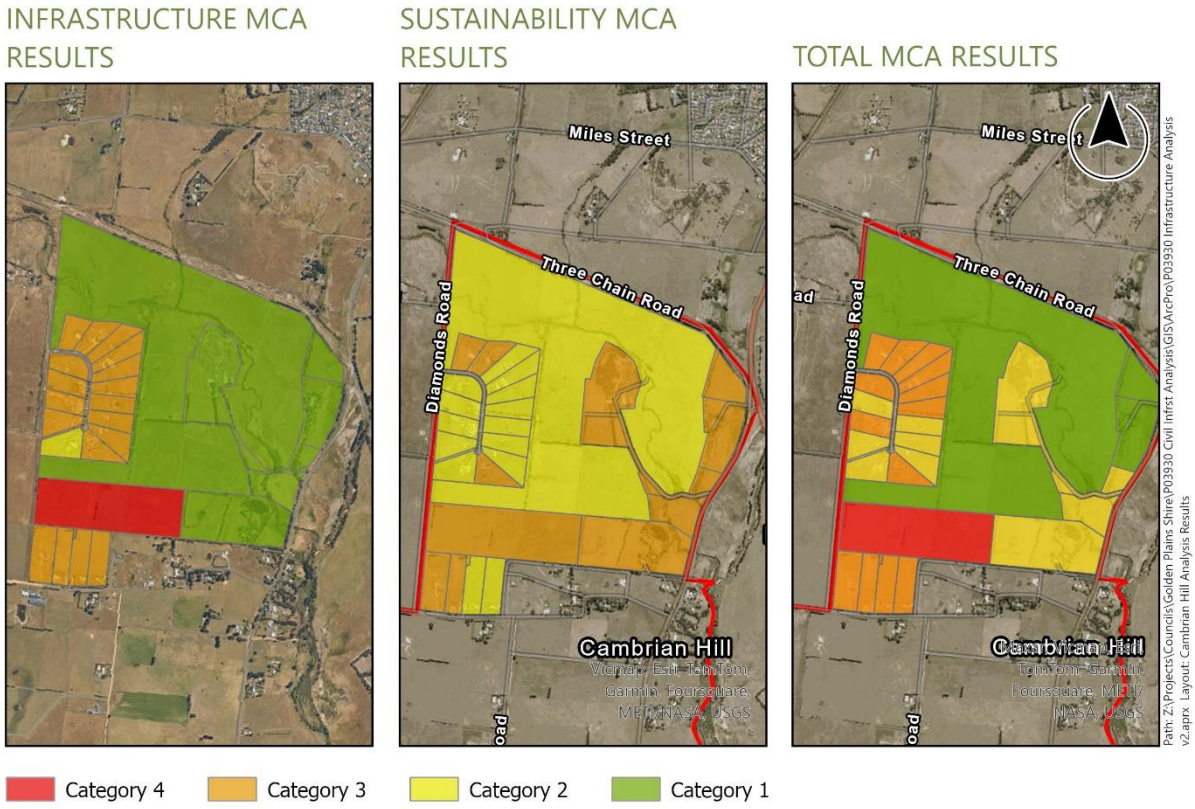


Figure 12 Score of each POIs within Cambrian Hill for the Infrastructure and Sustainability Analysis

The majority of parcels in Cambrian Hill (70 %) were assessed as Category 1 for the infrastructure analysis. This is due to the following:

- Close access to Ballarat rail trail and train station (approx. 8.5 km west of Cambrian Hill)
- Close proximity to existing main roads (Colac-Ballarat Road, Midland Highway)
- Close proximity to the existing electrical network
- Close proximity to existing water mains

The majority of POI in Cambrian Hill were assessed as being Category 2 (66%) for the sustainability analysis. This is likely due to the following:

- Access to community, health care and emergency facilities such as the nearby primary schools and learning centres as well as the Murphy Creek Fire Station.
- Access to recreation areas such as the Yarrowee River and Wall Street Reserve, racecourses and training tracks north of POIs
- Proximity to Ballarat urban growth areas

3.2. Lethbridge

Figure 13 below summarises the result of the MCA for each parcel within Lethbridge.

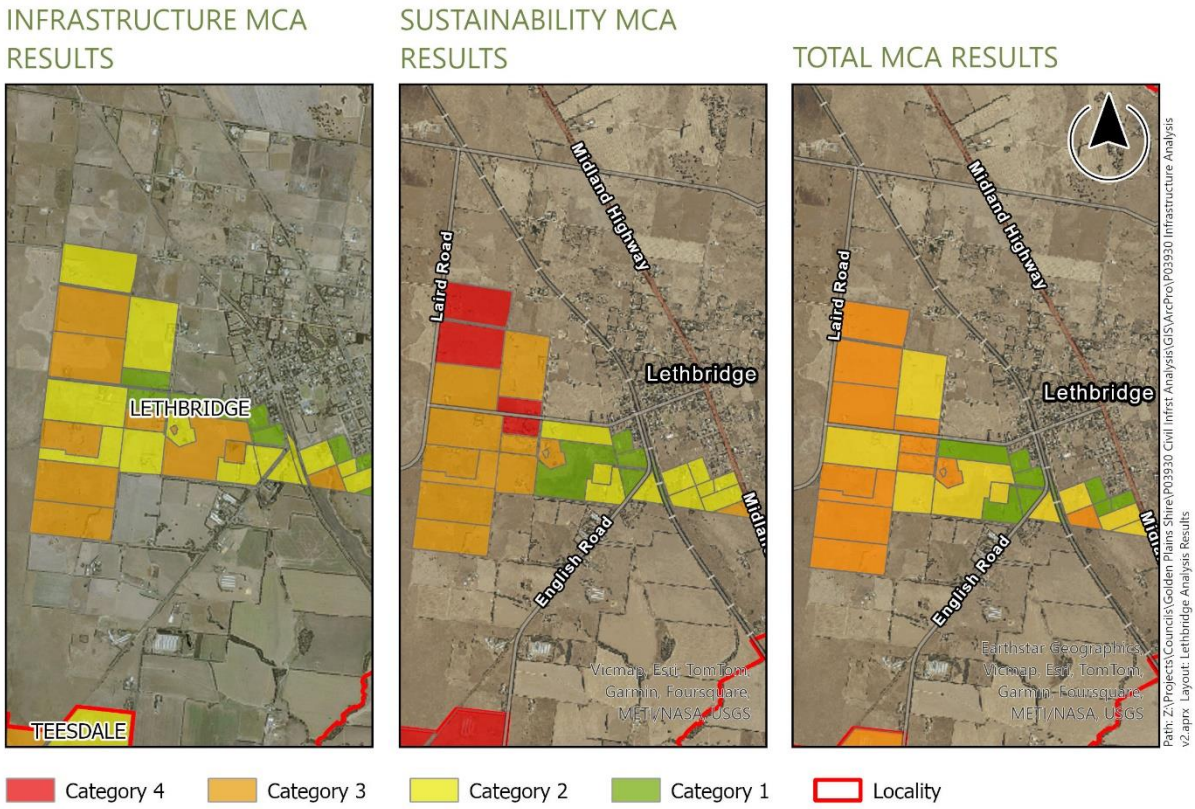


Figure 13 Score of each POIs within Lethbridge for the Infrastructure and Sustainability Analysis

The majority of parcels in Lethbridge were assessed as Category 3 (45%) for the infrastructure analysis. This is due to the following:

- Distance to existing water utilities networks i.e. water supply, stormwater and wastewater
- Distance to sewage network
- Access to existing public transport network

However, the majority of POI in Lethbridge were assessed as Category 3 (53%) for the sustainability analysis. This is likely due to the following constraints:

- Access to nearby healthcare services
- Access to existing renewable energy program
- Distance to waterways such as Stony and Bruce Creek which is also listed as areas of cultural heritage sensitivity

- Distance to Geelong urban growth areas
- Climate change resilience due to low presence of existing canopy cover

3.3. Meredith

Figure 14 below summarises the result of the MCA for each parcel within Meredith.

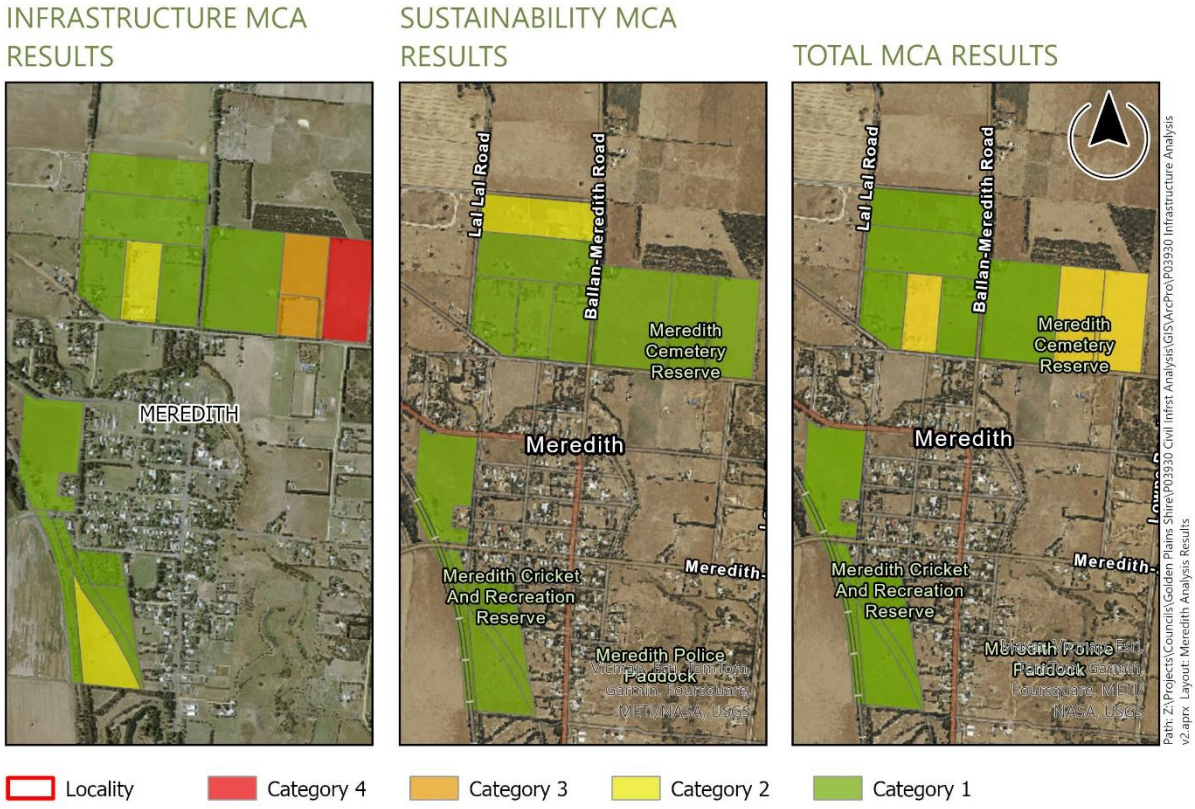


Figure 14 Score of each POIs within Meredith for the Infrastructure and Sustainability Analysis

The majority of parcels in Meredith were assessed as Category 1 (69%) for the infrastructure analysis. This is due to the following:

- Close proximity to existing main roads (Meredith-Mout Mercer Road, Ballan-Meredith Road, Slate Quarry Road and Midland Highway)
- Close proximity to existing electrical network
- Close proximity to existing water mains

Furthermore, the majority of POI in Meredith were also assessed as Category 1 (89%) for the sustainability analysis. This is likely due to the following opportunities:

- Access to community, healthcare and emergency services for all parcels. All parcels are less than 2 km of existing community, healthcare and emergency services
- Access to education for all parcels. All parcels are less than 2 km of education services such as those provided by Meredith Primary School and Meredith Community Centre
- Access to open spaces for all parcels. All parcels are less than 2 km to open spaces such as the Meredith Recreation Reserve, Meredith Police Paddock and Meredith Golf Club.

- Distance to watercourses such as Coolebarghurk Creek and associated recreational and amenity use values.
- Access to existing growth areas such as those Ballarat and Geelong that provide economic and employment opportunities to new development.

3.4. Stonehaven

Figure 15 below summarises the result of the MCA for each parcel within Stonehaven.

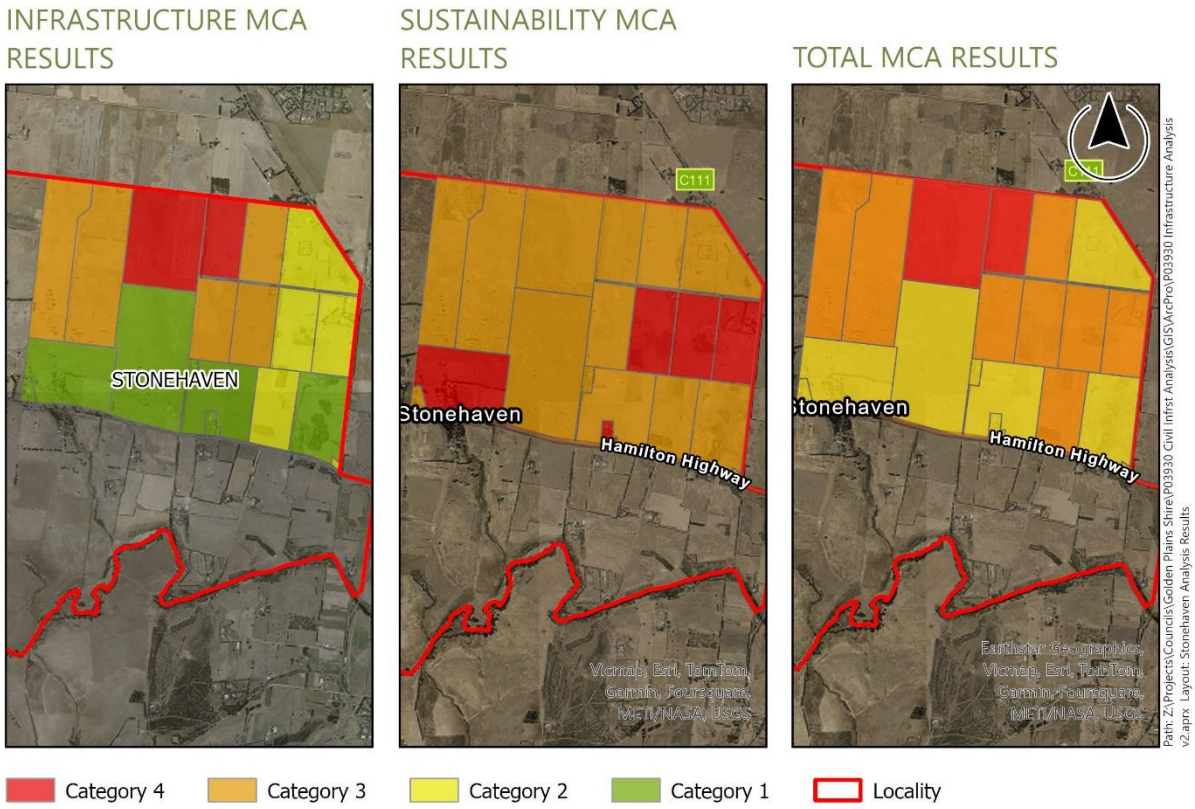


Figure 15 Score of each POIs within Stonehaven for the Infrastructure and Sustainability Analysis

The majority of parcels in Stonehaven were assessed as Category 1 (34%) for the infrastructure analysis. This is due to the following:

- Access to main highways such as the Hamilton Highway
- Proximity to existing bus routes (directly south of POIs on Hamilton Highway)
- Proximity to existing electrical network

POIs in Stonehaven were predominantly assessed as Category 3 (79%) for the sustainability analysis. This is likely due to the following constraints:

- Access to healthcare (closest healthcare facility is approximately 6km northeast of POIs)
- Access to community (closest services are approximately 7 km west of Stonehaven)
- Access to education (closest kindergarten is approximately 3.4 km northwest of POIs)
- Access to renewables
- Lack of climate change resilience due to low canopy cover

However, it is expected that as the Western Geelong Growth Area develops, these infrastructure and community services maybe become more accessible to Stonehaven as well.

3.5. Teesdale

Figure 16 below summarises the result of the MCA for each parcel within Teesdale.

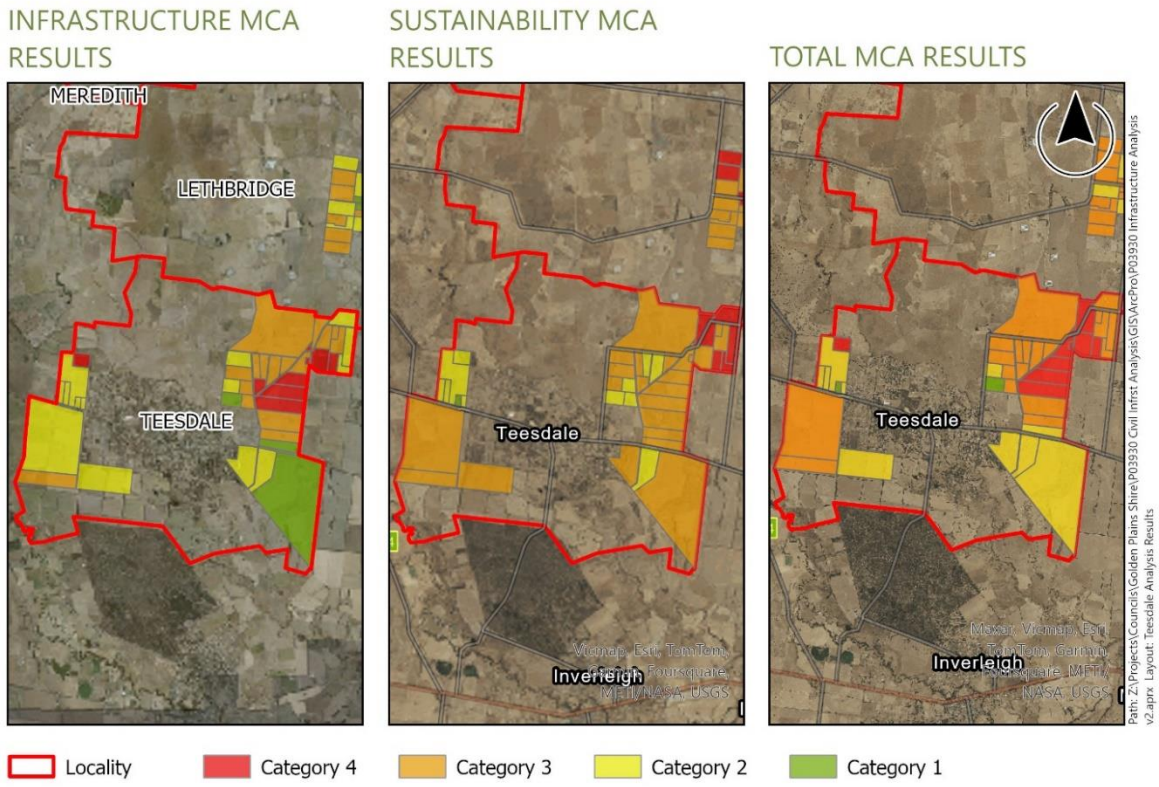


Figure 16 Score of each POIs within Teesdale for the Infrastructure and Sustainability Analysis

There was a spread of POIs in Teesdale across all categories for the infrastructure analysis, but the most profound were Category 2 (37%). This is due to the following:

- Access to existing road networks such as Bannockburn-Shelford Road, Teesdale-Inverleigh Road and Teesdale-Lethbridge Roads
- Close proximity to existing water mains
- Proximity to electrical network

Furthermore, POI in Teesdale scored more under Category 3 (80%) for the sustainability analysis. This is likely due to the following constraints:

- Proximity to sensitive areas and areas of cultural heritage sensitivity. Areas of cultural heritage sensitivity falls within several parcel boundaries in Teesdale
- Access to renewables
- Proximity to watercourses as up to 50 m, there is potential for developments to be inundated during flood events.
- Proximity to regional cities (Ballarat and Geelong)
- Lack of climate change resilience due to low canopy cover

3.6. Summary

Table 8 summarises the average infrastructure, sustainability and MCA scores for each township.

Table 8 Summary of Infrastructure and Sustainability Analysis for Each Township

Locality	Average Infrastructure Scoring	Average Sustainability Scoring	Average MCA
Meredith	111.3	193.7	305.0
Lethbridge	103.1	174.2	277.3
Teesdale	62.4	164.6	226.9
Cambrian Hill	90.9	167.5	258.4
Stonehaven	98.0	140.9	238.9

From Table 8, Meredith appears to be most suitable for residential growth from an infrastructure and sustainability perspective. Overall, Meredith had the highest average MCA score.

4. Conclusion and Recommendations

Based on the findings of the infrastructure and sustainability analysis, the following townships are ranked from most suitable to least. The townships that were identified as most suitable for residential growth are due to accessibility and proximity to existing infrastructure and services. based on which infrastructure requirements (via upgrades or expansion) to service these proposed areas is likely to be less complex and cheaper relative to the least suitable townships. Furthermore, it is also likely that these areas will likely secure more sustainable outcomes from a social and environmental perspective.

Table 9 Townships Ranked from Most Suitable to Least

Most Suitable	Meredith
	Lethbridge
	Cambrian Hill
	Stonehaven
Least Suitable	Teesdale

There and several further steps in the planning process to optimise the opportunities in the priority areas that have emerged from this assessment, and Meredith as the initial focus area.

Over the last two decades, sustainability assessment tools for addressing the built environment have emerged, going beyond the assessment of building to the broader assessment of communities in terms of wellbeing and resilience.

A sustainable development framework (Appendix 2) has been developed to inform the further planning and development of communities in line with the vision and aspirations expressed under each of the key themes in the Golden Plains Shire 2040 Vision.

The Council has or is in the process of developing or refining appropriate methods, standards and supporting tools to give effect to the overall objectives of the 2040 Vision. The framework provides example actions, there is opportunity to develop specific actions relevant to local context in the last column of Appendix 2 table.

Two conceptual project examples (Appendix 2) have also been provided for Meredith to demonstrate application of the guidance and 'sustainability thinking' encompassed in the guidance.

It is recommended that this framework is applied, tested and updated in the process of planning Meredith and thereby refined for application in the planning of subsequent settlement areas. The projects demonstrated in Appendix 2, is based on a high level assessment. Further detailed assessment and design is required to determine the feasibility of these options. It is also recommended that Appendix 2 is reviewed in conjunction with the web app linked in Section 2.5.

The MCA model is designed to be updated as more or better data becomes available. The weightings and criteria can also be amended. This valuable tool should be updated at regular interval/or as required to be based on planning horizons, changes in policies of other factors, so that it remains current.

5. References

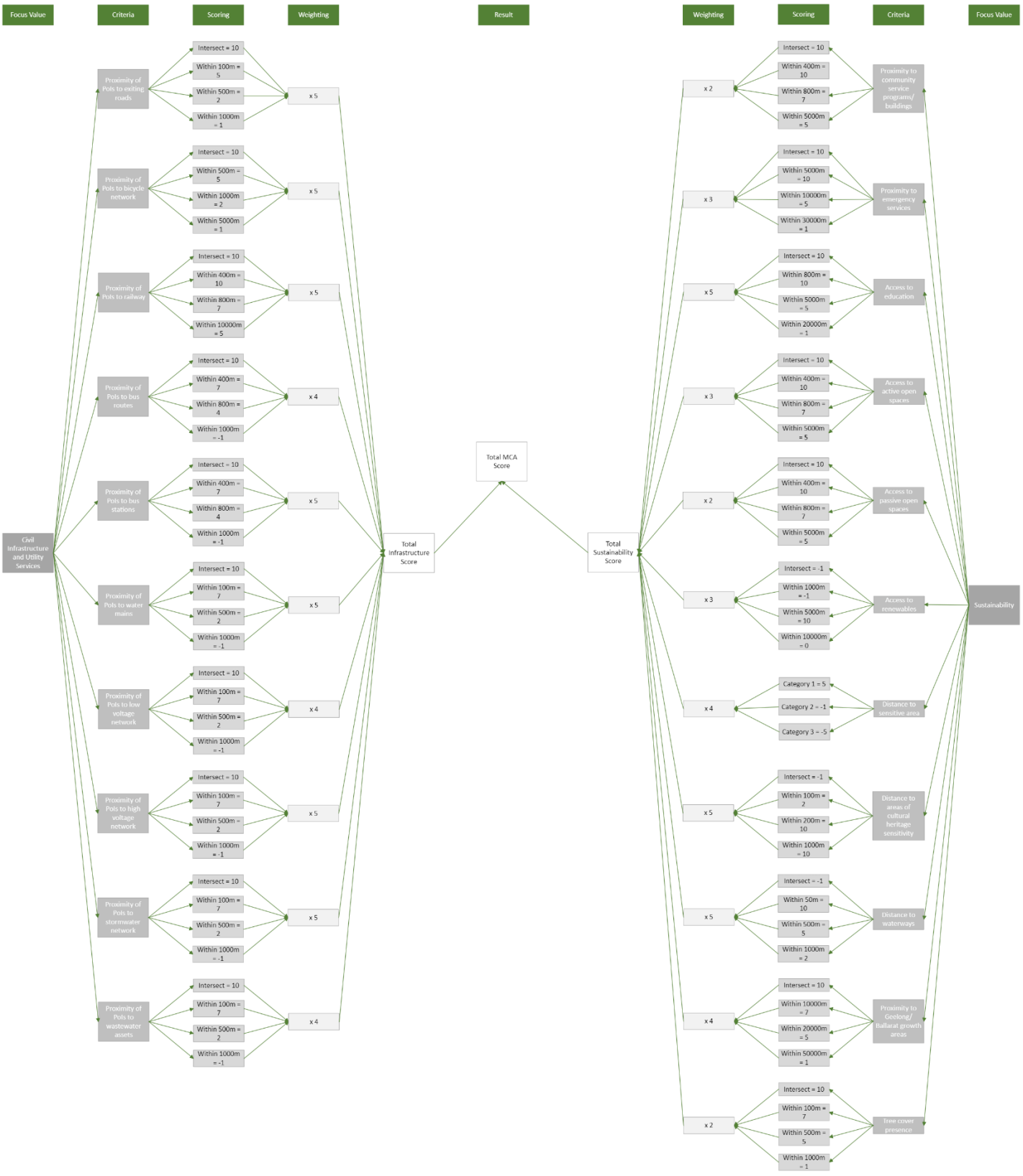
Department of Transport. (2008). *Public Transport Guidelines for Land Use and Development.* Melbourne: Department of Transport.

Golden Plains Shire Council. (2021). *Golden Plains Community Vision 2040.* Golden Plains Shire Council.

Kevin Hazell Bushfire Planning (2022). *Settlement-scale bushfire assessments for selected places in Golden Plains Shire,* Golden Plains Shire Council

SGS Economic and Planning. (2023). *Community Wealth and Wellbeing Analysis for Golden Plains Shire Council*

Appendix 1 MCA Model Framework



Appendix 2 Sustainable Development Guide

Appendix 1 Sustainable Development Framework for Golden Plains Shire Council

Summary

The purpose of this document is to provide a guide towards achievement of the expected outcomes of the 2051 growing places strategy, adopted from the Golden Plains Shire community Vision 2040.

The Golden Plains Shire Community Vision 2040 was developed after broad engagement with the community to capture the vision of Golden Plains residents. Community, Liveability, Sustainability and Prosperity were identified as Themes and Priorities, and within these, Vision Statements were captured to reflect what the residents of Golden Plains Shire wished to achieve by 2040.

In Phase 1, Civil Infrastructure Analysis, Meredith township was identified as most suitable for residential growth due to its accessibility and proximity to existing infrastructure and services. This document has been prepared for Golden Plains Shire Council as part of their Growing Places Strategy and is designed to guide sustainable community development across the Shire with initial application in Meredith township serving to inform the refinement of the guidance.

Approach

Over the last two decades, sustainability assessment tools for addressing the built environment have emerged, going beyond the assessment of buildings to the broader assessment of communities in terms of wellbeing, the environment and resilience. These include BREEAM[1] (Building Establishment Environmental Assessment Method) initiated in the UK in the 1990s; LEED[2] (Leadership in Energy and Environmental Design) based on the BREEAM standards and established in the US in 2009; and more recently, GreenStar Communities[3], also based on the BREEAM standards and released by the Green Building Council Australia

[1] https://breeam.com/standards
[2] https://www.usgbc.org/leed/rating-systems/leed-for-cities-communities
[3] https://new.gbca.org.au/green-star/rating-system/communities/

(GBCA) in 2012 and adopted by the New Zealand Green Building Council (NZGBC) in 2016. These standards have been reviewed as providing best practice criteria and implementation guidelines for sustainable development for communities.

The Council has, or is in the process of developing or refining, appropriate methods, standards and supporting tools to give effect to the overall objectives and aims for each theme and their associated objectives. These established themes and objectives have been integrated into the framework and therefore brings this work together in a single structure. In addition, it serves as a gap analysis, indicating where there is a need to adopt or develop guidance or tools to support sustainable development of communities.

- **Aspect:** Criteria that corresponds to, and is supported by, aspects identified in best practice sustainable development frameworks.
- **Aim/Vision:** Correspond directly to the Vision Statements detailed in each theme in Golden Plains Shire Vision 2040 and presents priorities and desired outcomes. They have been linked with corresponding aspects/criteria. Where indicated * an aim/vision outside of the scope of the GPS Vision Statements has been included to meet best practice criteria.
- **Guiding Principles:** These ensure that the community development objectives meet the long-term sustainability goals.
- **Action:** These include both best practice sustainable development recommendations for implementation as well as relevant actions recommended by the SGS Economics and Planning, Community Wealth and Wellbeing Analysis for Golden Plains Shire Council[4]. Where applicable, regional, national, and/or international examples of best practice are referenced.
- **GPS Initiatives:** Initiatives that have been implemented at a community level can be included here. This allows for a gap analysis to identify actions that can be considered.

Meredith emerged as the most appropriate township through the multi criteria assessment undertaken as phase 1 of this work, to focus and test the framework. A high-level example to conceptualise the holistic application of the framework to the development of Meredith is referenced in Annex 1.

[4] SGS Economic and Planning (2023), Community Wealth and Wellbeing Analysis for Golden Plains Shire Council

GOAL: To create a proud, safe, inclusive, connected, engaged, resilient, supported, and contributing community.

Aspect	Aim / Vision	Guiding Principle	Example Action	GPS Initiatives
Community Participation and Governance	To encourage community participation, inclusivity and value people and opinions.	Good governance is regarded as communities being able to contribute to decision processes and being involved in determining outcomes. One of the pillars of sustainable development is public participation in decision-making.	• Regular meetings and events are hosted by a community resident body to encourage active participation in decision-making. (1) (2)	
Social Cohesion	To create opportunities to meet, build resilient networks, volunteer, and contribute to local arts, culture, activities, and events.	Building social cohesion and promoting initiatives that strengthen community bonds and inclusivity underpins a community's ability to function effectively and adapt over time.	• A versatile community centre and event space has been established, designed to host events, gatherings and that encourage participation and volunteerism. (3)	

Aspect	Aim / Vision	Guiding Principle	Example Action	GPS Initiatives
Culture and Heritage	To value indigenous heritage and connect to the owners of the land.	Initiatives that incorporate heritage and celebrate culture support communities in developing a sense of place and identify.	• A Community Cultural Plan (CCP) has been established to outline a path to strengthening cultural connections and building identity through arts and cultural programs. (4)	
Safe Spaces	To create safe and supported spaces by taking into consideration 'designing-out-crime' principles.	CPTED strategies aim to deter decisions, reduce crime, and minimise fear of crime for residents.	• Crime Prevention through Environmental Design (CPTED) has been implemented at the planning and design stages of development. (5) (6) (7)	

References

(1) Kelly, J. (2010), Cities: Who Decides?, Grattan Institute, Melbourne.
(2) Bolitho, A. (2013), The Role and Future of Citizen Committees in Australian Local Government,
(3) Australian Human Rights Commission (2015), Building Social Cohesion in Our Communities.
(4) Municipal Association of Victoria (2014), Cultural Development Planning for Victorian Councils
(5) www.cpted.net
(6) https://www.planning.vic.gov.au/__data/assets/pdf_file/0014/4631/Safer_Design_Guidelines.pdf
(7) https://www.police.vic.gov.au/business-and-commercial

GOAL: To promote health and wellbeing, rural and urban living, a "country feel", active and passive recreation, services and facilities, and connected transport.

Aspect	Aim / Vision	Guiding Principle	Example Action	GPS Initiatives
Healthy and Active Living	The community is designed to encourage an active lifestyle and promote good health and wellbeing.	Creating vibrant, walkable, and bike-friendly urban spaces can support active living. Expanding access to healthcare contributes to the health and wellbeing of residents and improves the overall sustainability of communities.	• There are well designed walking paths and cycle lanes. (8) (9) • Residential dwellings have access to local parks. (10) • There is an easily accessible recreation facility within the community. (10) • The concept of "Living Streets" has been implemented. (11) • hone-based healthcare and health advice such as	

Aspect	Aim / Vision	Guiding Principle	Example Action	GPS Initiatives
			Healthdirect are advertised. (12) • Expanded mobile healthcare and mobile clinics. (12)	
Community Facilities and Services	To create access to services, facilities, and activities for people of all ages and abilities.	Ensuring that community design and services are accessible to everyone promotes equal opportunities for participation and engagement and fosters inclusivity.	• Multigeneration facilities such as community centres and public spaces feature playgrounds, fitness areas and communal gathering spots. (13) (14)	
Public Spaces	To create places, spaces and programs that support active and passive recreation and socialisation.	Designing flexibility into public spaces ensures that they are versatile and capable of meeting a wide range of community needs for recreation and social engagement.	• Adaptable infrastructure such as movable seating, temporary stages, and modular sports facilities have been developed to easily reconfigure spaces based on needs. (15)	
Transport Connectivity	To provide safe, connected pedestrian and transport infrastructure and services.	Developments that promote accessibility encourages uptake of public transportation and helps to reduce transport-related pollution and congestion.	• Transportation guidelines from the Planning Victoria Roadmap paper have been considered. (16) • A 'Town Hopper' shuttle bus allows locals to easily move around the Shire. (12) • Continued lobbying for expanded public transport	

Aspect	Aim / Vision	Guiding Principle	Example Action	GPS Initiatives
			provision by state and federal government. (12) (17)	
Urban and Rural Spaces	To promote diversity of living alternatives, balancing growth, and retaining a 'country feel'.	Design principles of integrated development emphasises blending new developments seamlessly with the existing environment and promotes growth that does not compromise the attributes of a place.	• Sensitive architectural and landscape design uses materials and styles that complement rather than dominate the existing surroundings and reflect the local culture and natural environment. (18)	
* Multi-Generational Living	To create environments that support interaction among different age groups.	Intergenerational solidarity emphasises the creation of social and physical environments that encourage interaction among different age groups, fostering a sense of community and well-being.	• Housing planning supports multi-generations living such as apartments with flexible floor plans for families that include space for elderly parents or community living arrangements. (19) (20)	

References

(8) http://www.bicyclenetwork.com.au/general/bike-futures/92297/
(9) https://www.goldenplains.vic.gov.au/sites/default/files/Paths%20and%20Trails%20StrategyVol2_Final182013.pdf
(10) https://heartfoundation.org.au/images/uploads/publications/Active-Living-impact-checklist.pdf
(11) https://www.victoriawalks.org.au/Streets_Alive_Yarra/
(12) SGS Economics and Planning: Community Wealth and Wellbeing Analysis pg. 7 (Table ES2: Achieving Healthy, Connected Communities)

(13) https://universaldesignaustralia.net.au/multigenerational-planning-and-universal-design/
(14) https://www.goldenplains.vic.gov.au/sites/default/files/GPSC_AAIPlan2020-24.pdf
(15) Sanei, M, Khodadad, S (2018). Flexible Urban Public Spaces and their Designing Principles. Journal of Civil Engineering and Urbanism, 8(4), 39-43.
(16) https://www.planning.vic.gov.au/__data/assets/pdf_file/0038/638399/Environmentally-sustainable-development-of-buildings-and-subdivisions-A-roadmap-for-Victorias-Planning-System.pdf
(17) https://www.goldenplains.vic.gov.au/sites/default/files/2022-11/Transport_ConnectionsStudy22_Export.pdf
(18) https://read.oecd-ilibrary.org/urban-rural-and-regional-development/rural-urban-partnerships_9789264204812-en#page1
(19) https://www.gjgardner.com.au/learn/planning-your-home/multi-generational-living-australia/
(20) https://www.101residential.com.au/blog/multi-generational-homes-for-future-living/

SUSTAINABILITY

GOAL: To promote environmental stewardship, value and preserve ecosystems, nature, cultural heritage, promote responsible behaviour, and a clean and green future.

Aspect	Aim / Vision	Guiding Principle	Action	GPS Initiatives
Environmental Quality & Emissions Reductions	To maintain high environmental quality, stewardship of our natural assets, and promote activities to reduce emissions.	Encouraging strong Sustainable Development enables meeting the needs of the present without compromising the ability of future generations to meet their own needs.	• Community-wide recycling and composting programs are established. (21) (22) • The Golden Plains Shire Environment Strategy has been implemented. (23) • The use of agriculture technology is advertised and prioritised. (24) • There is access to low-interest loans for the purchase and upgrade of more sustainable technology. (24)	

Aspect	Aim / Vision	Guiding Principle	Action	GPS Initiatives
Biodiversity and Ecosystem Protection	To integrate natural landscapes and features into urban design, preserving natural ecosystems, and enhancing biodiversity.	Ecological urbanism encourages the need to design and manage communities in harmony with nature, fostering sustainable urban environments that support both resident well-being and biodiversity.	• Landscape and biodiversity guidelines from Victoria Planning Roadmap Paper have been considered. (25) • Natural habitats and biodiversity through conservation efforts are protected through developing local programs and policies. (26)	
Integrated Water Cycle	To promote sustainable water management.	Sustainable communities respect the environmental systems that support them and community design should promote and encourage best practice in sustainable water management.	• The IWM Framework for Victoria has been implemented to ensure IWM approach to urban water planning. (27) • Effective stormwater management and the principles of Water Sensitive Urban Design (WSUD) have been implemented. (28) (29) (30)	• Update planning scheme to require development proposals to include an IWM plan
Sustainability Awareness	To provide information on, and promote positive attitudes towards, land use, waste management, climate change and natural resource management.	Promoting the role of educating residents on sustainable development attributes in their living environment to encourage positive attitudes and behaviour and foster a sense of responsibility.	• A Community Design Guide is developed for, and is made available to, all residents that includes relevant information pertaining to the	

Aspect	Aim / Vision	Guiding Principle	Action	GPS Initiatives
			sustainability attributes of the community. (31)	
Energy Efficient Homes and Buildings	To promote energy efficient, high performance and healthy residential and commercial buildings.	Homes and commercial building built using best practice benchmarks for sustainability are well documented to reduce operating costs, promote health and wellbeing, address climate change using renewable energy.	• Approaches for sustainable buildings in Planning Victoria Roadmap Paper have been considered. • Rating tools such as GreenStar Building are utilised to provide a framework for sustainable buildings. (32) (33)	
Building Climate Resilience	To enable response to the direct and indirect impacts of climate change.	Incorporating climate resilience into urban community development planning is essential for building sustainable, safe, and thriving cities that can withstand the challenges posed by a changing climate.	• The Golden Plains Climate Emergency Plan 2022-2032 has been implemented to achieve adaptation and mitigation targets for climate positive development. (34) (35) (36) • Seek state or federal funding for a community adaptation and resilience fund to finance actions in vulnerable communities. (24)	

References

(21) https://www.wasteauthority.wa.gov.au/programs/view/clean-communities
(22) https://www.goldenplains.vic.gov.au/sites/default/files/Waste%20and%20Resource%20Recovery%20Strategy%202020-2030.pdf
(23) https://www.goldenplains.vic.gov.au/sites/default/files/Golden%20Plains%20Shire%20Environment%20Strategy%202019-2027%20-%20FINAL.pdf
(24) SGS Economics and Planning: Community Wealth and Wellbeing Analysis pg. 8 (Table ES3: Achieving a Sustainable Local Environment)
(25) https://www.planning.vic.gov.au/__data/assets/pdf_file/0038/638399/Environmentally-sustainable-development-of-buildings-and-subdivisions-A-roadmap-for-Victorias-Planning-System.pdf
(26) https://www.dcceew.gov.au/environment/biodiversity/conservation/cep
(27) https://www.water.vic.gov.au/our-programs/integrated-water-management
(28) www.wsud.org
(29) www.waterbydesign.com.au/whatiswsud/
(30) www.watersensitivecities.org.au/
(31) City of Melbourne (2021), Central Melbourne Design Guide.
(32) https://www.gbca.org.au/green-star/why-use-green-star/why-design-or-build-a-green-residential-building/
(33) https://www.gbca.org.au/green-star/why-use-green-star/why-design-or-build-a-green-commercial-building/
(34) https://www.goldenplains.vic.gov.au/consultations/golden-plain-climate-emergency-plan-2022-2032-adopted
(35) https://www.climatechoices.act.gov.au/resilience-and-extreme-events/climate-resilient-city
(36) https://www.ihs.nl/en/themes-0/urban-sustainability-and-climate-change-resilience

GOAL: To promote learning and education, shopping, goods and services, employment opportunities, local agriculture and production, and partnerships.

Aspect	Aim / Vision	Guiding Principle	Indicator / Action	GPS Initiatives
Education Development	To provide access to quality education and training.	Providing access to a variety of education opportunities and skills development programs can increase uptake of further education.	• Higher education facilities are located within the centre of the development and easily accessed via public transportation. (37) (38) (39)	
Mixed-Use Development	To create access to shopping, goods and services, hospitality, tourism, and events.	Social, environmental, and economic benefits from mixed-use development include a more attractive town centre, less need to travel and reliance on cars, more local employment, and services.	• The development is designed to achieve high density urban development guidelines with walkable access to amenities such as food, retail, and community facilities. (40) (41) (42)	
Employment Opportunities	To promote a diverse economy with a range of job opportunities, including local	Promoting economic resilience within a community can help to withstand local challenges while	• Establish a network of local anchor businesses or co-operative to expand local procurement and hiring, and	

Aspect	Aim / Vision	Guiding Principle	Indicator / Action	GPS Initiatives
	employment initiatives and support for small businesses.	providing opportunities for all community members.	who can participate in economic localisation initiatives. (43)	
Economic Inclusion	To improve access to economic resources and opportunities for all segments of the community through partnerships, innovation and support for local producers and businesses.	By focusing on inclusive economic growth, communities can foster an environment where resources and opportunities are accessible to everyone, supporting resilience and social cohesion.	• Maintain practice of developing individual community plans and investigate expanding their scope into town economy development and governance. (43) • Explore initiatives that promote participatory budgeting at the town level. (43)	
Strategic Partnership Development	To maintain and strengthen relationships with Government, regional development boards and business groups.	Fostering collaborative governance and effective cooperation among various stakeholders can assist in achieving shared goals.	• Development of a multi-stakeholder partnership platform that can identify key regional and business stakeholders, define responsibilities, and serve as a mechanism for collaborative governance. (44)	

References

(37) https://www.iesalc.unesco.org/en/2024/02/20/the-local-impact-of-higher-education-building-sustainable-cities-and-communities/

(38) https://www.timeshighereducation.com/blog/urban-development-universities-can-be-better-neighbours

(39) https://link.springer.com/chapter/10.1007/978-3-030-78597-0_3

(40) https://www.urban.com.au/guides/the-top-five-reasons-to-buy-in-a-mixed-use-development

(41) https://www.indesignlive.com/ideas/why-it-takes-a-village-mixed-use-developments

(42) https://greenmagazine.com.au/leading-urban-planners-pick-of-five-top-australian-mixed-use-projects-beneficial-to-communities/

(43) SGS Economics & Planning: Community Wealth and Wellbeing Analysis pg. 6 (Table ES1: Achieving Prosperous Small-Town Economies)

(44) https://sdgs.org.au/project/strengthening-multi-stakeholder-partnering/

Annex 1: Meredith Potential Project Examples

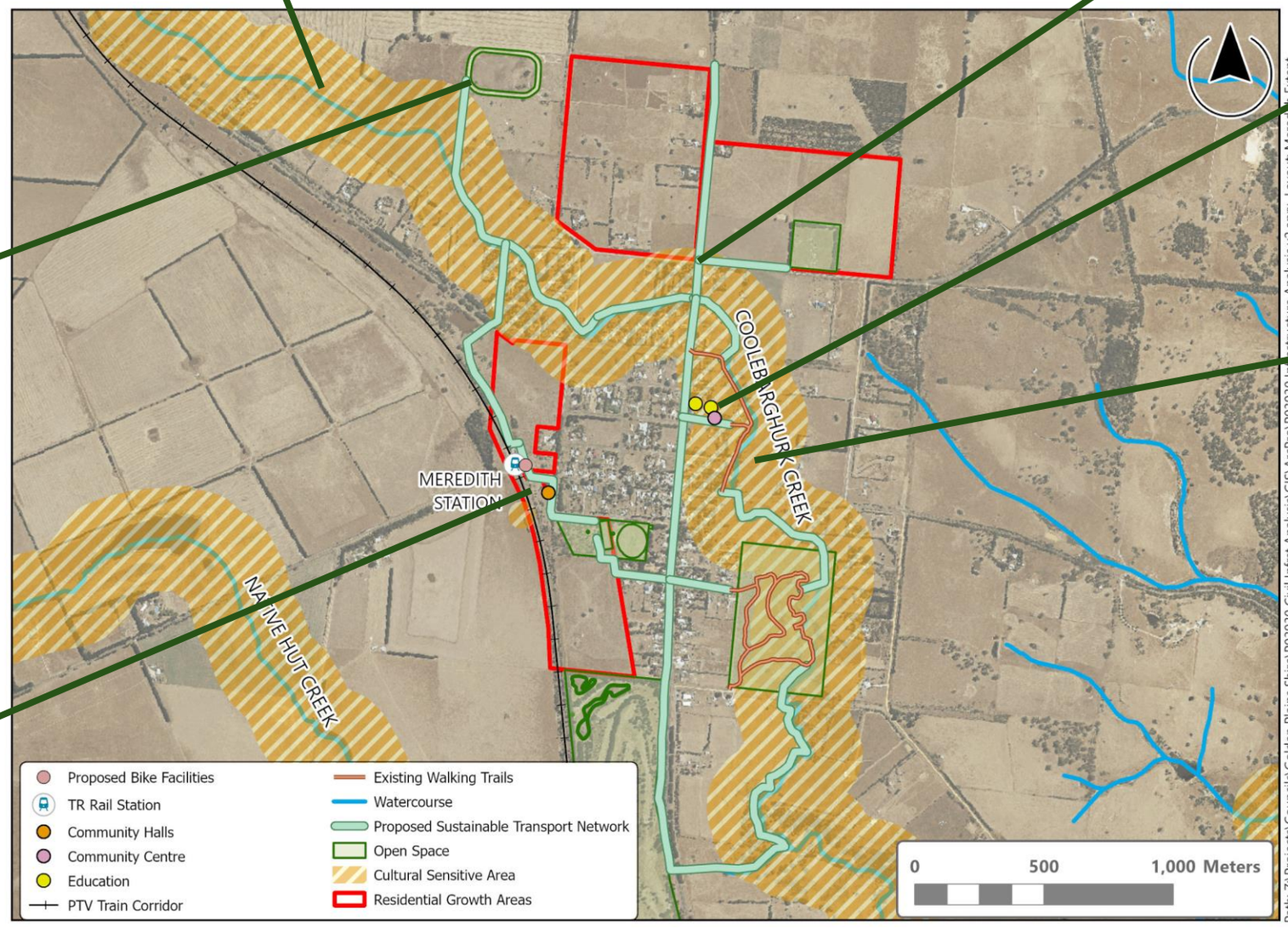
Sustainable Transport Network Concept

A sustainable transport network is proposed to connect the proposed growth areas to existing and new recreation areas as well as school and community areas. The network can provide connection to natural and cultural values provided by Coolebarghurk Creek. The below concept provides further detail on the arrangement of the network as well as linkages to relevant themes within the above guidelines.

Aspect: Healthy and active living.
Concept: Create a vibrant, walkable, and bike-friendly urban spaces can support active living, contribute to the health and wellbeing residents and improve the overall sustainability of communities. Existing track can be incorporated with water sensitive urban design (discussed in next example), and infrastructure for recreational activities such as skate parks, jungle gyms or pools. Pool water can be reused for other purposes such as fire fighting when required

Aspect: Transport Connectivity
Concept: Provide a safe, connected pedestrian network to provide pedestrian with access to infrastructure/ transport in Meredith. Park and ride infrastructure established to encourage use of public transport and connection via rail to regional centers, supporting active lifestyle and climate mitigation.

Aspect: Biodiversity and Ecosystem Protection.
Concept: To integrate natural landscapes and features into urban design, preserving natural ecosystems, and enhancing biodiversity. Restoration of the riparian habitat – removal of exotic weeds, and planting with indigenous species that assist in meeting biodiversity targets and provide shade to users but also consider fire risk (climate resilience). Include educational information on the species ecological and cultural values to enhance understanding and appreciation of the . Involvement of community, and particularly youth in the process provides an opportunity to enhance this understanding and stewardship of the township's natural assets.



Aspect: Urban and Rural Spaces
Concept: Network to be designed to blend new developments with existing and indigenous environmental values that reflect the local culture and natural environment. For example, incorporating living streets concept along the main residential roads

Aspect: Community and Facilities
Concept: Create connectivity and access to services, facilities, and activities for people of all ages and abilities

Aspect: Culture and Heritage & Education Development
Concept: Incorporate informative, educational pieces along the Coolebarghurk Creek which was a significant resource to the Wathaurong people and offers an opportunity for the community to connect with the past and the land as well as develop a sense of place.

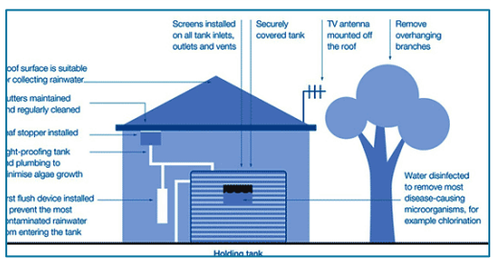
INTEGRATED SUSTAINABLE TRANSPORT CONCEPT

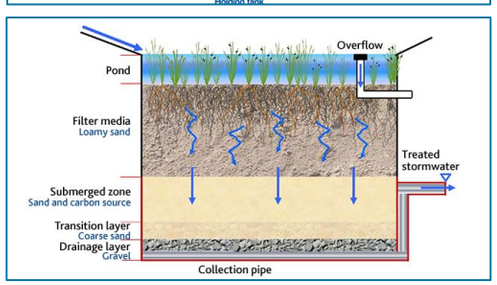
Nature-Based Solutions Considerations

Prior to undertaking development within the proposed growth areas, consideration to nature based such as how the delivery of water, wastewater and stormwater services can contribute to water security, public and environmental health as well as urban amenity. High level options identified in the below diagram, includes stormwater harvesting and reuse, green-blue infrastructure to promote climate resilience, retention of natural amenity, groundwater recharge, and treatment of wastewater prior to discharging into waterways which protects the health of those waterways and its ecosystems.

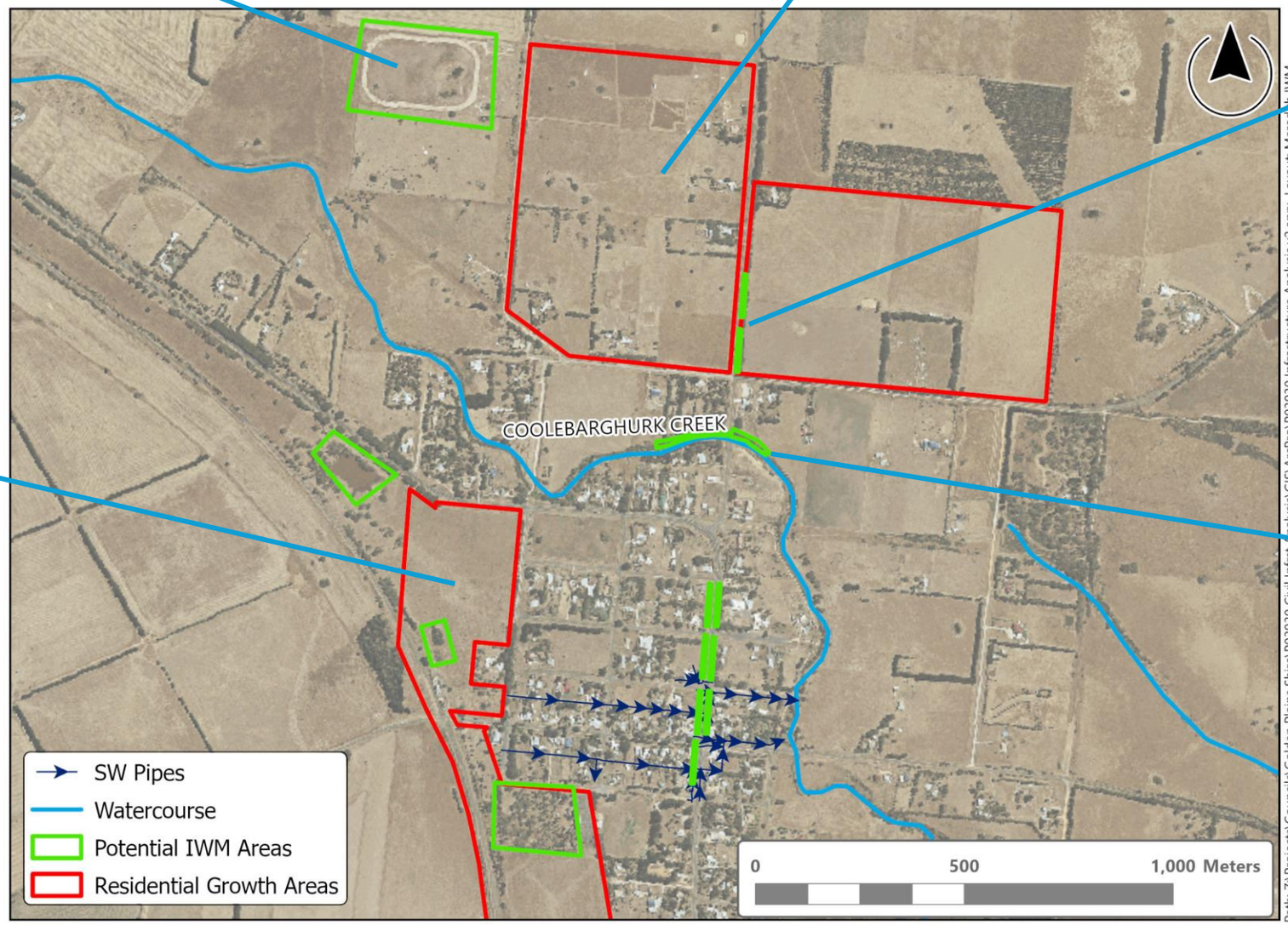
Aspect: Integrated Water Management
Concept: Incorporate integrated water management principles, where feasible, into available green spaces such as recreational/ open spaces. This will provide sustainable water management by repurposing wastewater for non-potable use and thus promotes water security. A wetland system that treats stormwater at a precinct scale can be captured and reused.

Aspect: Integrated Water Managemetn
Concept: On lot treatment and harvesting can provide water reuse for non potable use such as toilet flushing and irrigation while treating stormwater prior to discharging into existing network.



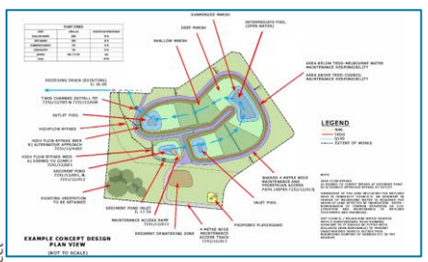


Aspect: Energy Efficient Homes and Buildings
Concept: Homes and commercial building built using best practice benchmarks such as GreenStar Homes to reduce operating costs, promote health and wellbeing, address climate change using renewable energy.



Aspect: Building Climate Resilience
Concept: Blue-green infrastructure such as raingardens and tree pits can be incorporated into living street concept (mentioned in above section). This induces local thermal cooling from blue-green infrastructure.

Aspect: Biodiversity and Ecosystem Protection
Concept: Retrofitting subcatchment scale treatment devices to protect Coolebarghurk Creek from pollutants from urban stormwater. This subsequently protects the biodiversity values and ecosystems that are reliant on the creek.



NATURE BASED SOLUTIONS CONSIDERATIONS

MORPHUM
environmental

Co-creating a thriving ecosystem

AUSTRALIA

Melbourne
Level 17, 31 Queen Street,
Melbourne 3000
Tel: +61 3 9111 5640

NEW ZEALAND

Auckland
Level 4, 18 Sale St,
Auckland Central, Auckland 1010
Tel: +64 9 377 9779

Nelson
3 Wensley Road, Richmond 7020

Wellington
9 Tory Street, Te Aro,
Wellington 6011
Tel: +64 4 802 4987

Waikato
65 Victoria St, Hamilton 3204

info@morphum.com | www.morphum.com.au