

Crystal Brook Concept Plan May 2020

Prepared for
City of Kalamunda

Prepared by
 **RobertsDay**
planning·design·place

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SUMMARY

The Crystal Brook Concept Plan reimagines Foothills living for the 21st Century.

Building on the aspirations of local residents, the Plan envisions a place where community and nature come together as a living landscape.

A place inspired by its history, where residents embrace sustainable design and self-sufficiency.

A place which protects its trees, wildlife and tranquil character while welcoming those who seek to share in its rare lifestyle.

What is a Concept Plan?

The Crystal Brook Concept Plan is a strategic blueprint for future planning and growth of the Wattle Grove South Urban Investigation Area ('Crystal Brook') towards the year 2050.

It establishes the overarching design principles and planning strategies necessary to meet the progressive aspirations of landowners and satisfy the Wattle Grove South planning objectives adopted by the City of Kalamunda Council in February 2019.

Implementation of the Plan through further planning and consultation will ensure growth is sustainable and deeply connected to the rural history, landscape character and unique lifestyle of the area while also satisfying State planning policy requirements.

How has the community shaped the Plan?

All aspects of the Concept Plan have been directly informed by detailed consultation and design collaboration with local residents and landowners.

The consultation process spanned 5 months and included a detailed community survey, preliminary roundtables with key stakeholder groups, phone and email engagement, a principles-oriented visioning workshop and two design development workshops.

Through this process, the community has directly shaped all aspects of the Plan, including the name, vision and principles, concept plan map and implementation strategies.

What happens now?

This document is only the start of a wider and more detailed conversation about the future of the area. The Concept Plan is a preliminary and conceptual instrument which will not directly lead to any planning changes.

While this document outlines a preferred outcome based on community input, the adoption or progression of its strategies and key features is subject to further consideration by the Council. Should the Council resolve to further progress the Concept Plan, a significant level of further planning and community consultation will be required to ensure the vision comes to fruition.

What does the Concept Plan propose?

The Concept Plan suggests a new way of thinking about urban consolidation in peri-urban areas, promoting an organic, localised and neighbour-led form of growth rather than the conventional suburban masterplanning approach.

It proposes clusters of low carbon and off-grid development on spacious lots filled with native vegetation and edible produce, connected by naturalistic roads and trails, set within a continuous and ecologically rich landscape.

Growth consistent with these principles could potentially accommodate 1,500-2,500 additional dwellings by 2050. This potential outcome is consistent with the City of Kalamunda Housing Strategy (Draft 2020) but is lower than the 4,200 dwellings presumed by the State Planning Framework (development at 15 dwellings per hectare).







1.1 PURPOSE

The Crystal Brook Concept Plan is a strategic blueprint for future planning and growth of the Wattle Grove South Urban Investigation Area ('Crystal Brook') towards the year 2050.

It establishes the overarching design principles and planning strategies necessary to meet the progressive aspirations of residents and satisfy the adopted objectives of Council which are to:

1. Exclude any general or light industrial land uses;
2. Reflect and acknowledge existing lifestyle and recreational opportunities of the area;
3. A high-quality residential outcome that includes a range of densities;
4. Include an appropriate amount of commercial development based on best practice design principles, including but not limited to public transport, technology, educational, medical and retail opportunities;

5. Retain existing vegetation and tree canopy cover where possible;
6. Consider tourism development opportunities that embrace the environmental, social and financial aspects of the City of Kalamunda; and
7. Provide for modern sustainable housing design principles including renewable energy capture, water sensitive urban design, storage, sharing capabilities and smart city initiatives.

Implementation of the Concept Plan through further detailed planning and community consultation offers a rare opportunity to pioneer a new form of innovative and sustainable urbanism which is deeply connected to the rural history, landscape character and unique lifestyle of the area while satisfying State planning policy requirements.

1.2 PROCESS

All aspects of the Concept Plan have been directly informed by detailed consultation and design collaboration with members of the local community.

The consultation process was delivered consistent with best practice IAP2 principles with a focus on meaningfully including stakeholders in the design development and technical constraints resolution process.

This process spanned 4 months and included a detailed community survey, preliminary roundtables with key stakeholder groups, phone and email engagement, a principles-oriented visioning workshop and two design development workshops. The reach this process included:

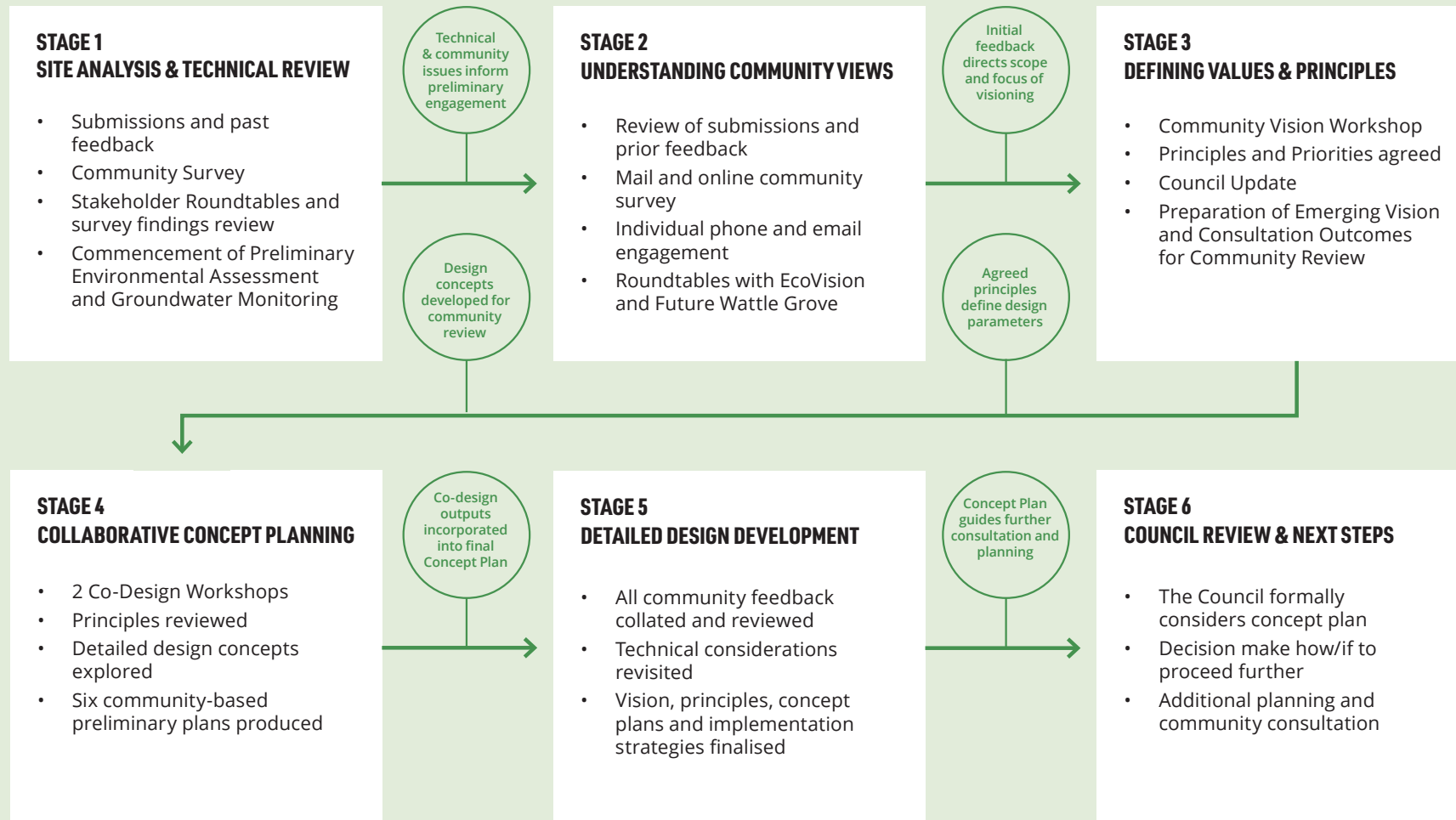
- 109 completed surveys (19.8% of population aged 15+)
- 53 community attendees at evening Vision Workshop
- 40 participants across two half-day Co-Design Workshops
- 21 individual consultations

This document reflects the outcomes of these varied exercises, with the views of the community reflected in the following key areas:

The **Concept Plan Map** which is an amalgam of six preliminary plans drawn by stakeholders with urban design and technical advisors at the Co-Design workshops;

Place Name, Vision and Principles which were drawn directly from community contributions at the Vision Workshop as well as survey responses; and

Implementation Strategies which reflect community priorities and were individually subject to review, feedback and voting by community members.



1.3 THE SITE

Crystal Brook is a peri-urban district situated at the base of the Darling Scarp in the suburb of Wattle Grove. It is approximately 30 minutes drive from central Perth and 10 minutes from Kalamunda Town Centre.

Local Community



The area currently contains 253 dwellings with an approximate population of 649 (ABS 2016). Residents are predominantly European or Australian in ancestry. The median age is 47 years, 11 years above the state median.

The area has an employed labour force of 353, with a notable number of retired or semi-retired persons alongside young families. Technician/ trade and administrative/clerical work are the most common occupations in the area with a reported household income 19-28% above the WA median.

Urban Structure



The area has a diverse and varied peri-urban structure characterised by large semi-rural lots generally ranging from 2,000m² to 4ha with some larger landholdings. This range of lot sizes reflects historical patterns of rural subdivision from the 1940s onwards, with large grazing lands incrementally subdivided into progressively smaller lots with limited coordination.

Lots are accessed from a relatively disconnected road network with a strong rural character. While some lots are substantially cleared, many contain culturally and environmentally significant trees and remnant vegetation.

Regional Setting





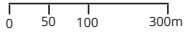
Crystal Brook is a secluded area with a clearly defined perimeter, being situated against the Darling Range Reserve to the east and separated from surrounding industrial and residential areas due to its position east of Tonkin Hwy and south of Welshpool Rd East.

The Maddington Kenwick Strategic Employment Area (MKSWA) industrial precinct is located opposite Tonkin Highway with rural-residential properties within the City of Gosnells to the south.



PLAN 1
CONCEPT PLAN AREA

-  Site Boundary
-  Major Road



1.4 KEY ISSUES

Crystal Brook has a range of unique attributes that define it as a unique locality in the context of wider Perth and influence future planning and development of the area.

Urban Expansion



The site is predominantly identified for Urban Expansion and Urban Investigation under the North-East Sub-regional Planning Framework, excepting a Rural corridor fronting both sides of Welshpool Rd East and an established large-lot suburban subdivision along Judith Rd which is identified as Urban.

This strategic planning designation establishes a significant portion of the site as a candidate for future urban which would typically be expected to be delivered at a standard density of 15 dwellings per gross urban zoned hectare.

Environmental Assets



Level 1 ecological surveys and previous environmental investigations have identified certain areas of some environmental significance within the site. This includes limited patches of Banksia Woodland and other threatened and significant flora, as well as a wider distribution of trees suitable for cockatoo foraging and breeding.

In addition to this preliminary technical reporting, residents have reported sightings of other threatened fauna and identified other exotic trees and flora as having strong cultural and community value.

Technical Constraints



A range of technical constraints have been identified through prior planning and technical investigations which will require detailed resolution if planning is further progressed.

These constraints include a lack of established sewer servicing, key intersection upgrade requirements, acoustic impacts arising from major roads and increasing operations at Perth Airport, groundwater separation, drainage requirements and gas pipeline and power line easements. These constraints have been considered at a preliminary level through the concept plan.



1.5 STAKEHOLDER FEEDBACK

Throughout the engagement process, local community members expressed a wide and diverse range of views. From this feedback, it is clear that there are mixed feelings regarding the desirability and suitable scale of future growth, if any. Despite these differences, residents were strongly aligned to a number of key themes relating to innovation, sustainability and the environment as summarised below.

Detailed results of the engagement process are provided at *Appendix 1 – Engagement Report*.

Keep the Trees

Residents strongly expressed that all trees have value regardless of their formal status under environmental expectation. They wish to see tree retention be the primary guide and focus of design and planning.

Prioritise Sustainability

Residents are passionate about sustainability and wish to see innovative design strategies employed to protect the environment and address climate change. They expect new development to meet the highest standards of ecologically sensitive design.

Building Community

Residents value the diverse and multi-age nature of their community and the bonds and relationships they have built. They also like the opportunities that spacious blocks afford to accommodate multiple generations on a single property and create new types of community.

Special Lifestyle

Residents expressed that their lifestyle was valuable and has been intentionally cultivated through their management of their land over time. They wanted to see this maintained into the future and not destroyed by insensitive development.

Peace and Quiet

The tranquil nature of the area and it's clear contrast with the surrounding City was a key attribute for many people who find it beneficial to their health and lifestyle. Ensuring development does not disrupt their quiet enjoyment of land.

Individual Choice

Residents broadly acknowledge there will need to be change over the long term and are open to this being coordinated through the individual decisions of landowners, rather than being foisted upon them. Some residents are keen to develop and wished to see these entitlements provided in a responsible way.

One with Nature

Places for kids to run free and explore, and trails and paths for adults to enjoy, were key desires of the community for the future. Getting closer to nature and bringing up kids in a spacious and safe environment was a clear theme.

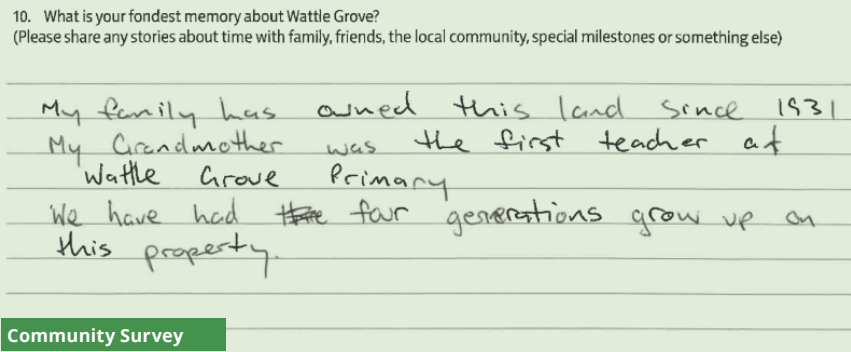
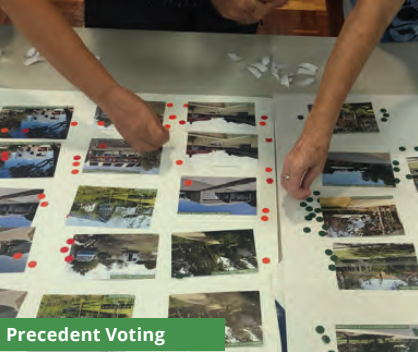
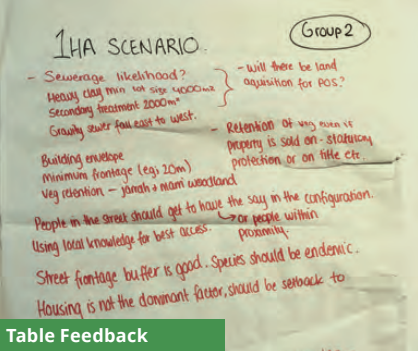
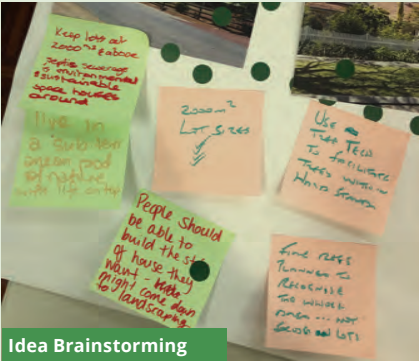
Avoiding the Ordinary

Residents aspire to achieve something unique and special in their area and don't want to see more of the same development found elsewhere. Lot sizes, greenery, road design and limiting commercial activity to acceptable levels were raised as extensions of this theme.

Direct Involvement

Residents are passionate about their home and are willing to give their time and effort to taking part in detailed and complex planning tasks to ensure their aspirations are realised. They wish to be genuinely and meaningfully engaged into the future.

POSSIBLE STRATEGY	I LOVE THIS	I LIKE THIS	I COULD LIVE WITH THIS	I DON'T LIKE THIS	COMMENTS
a) Housing Construction and Materials		✓			WITH AIRCRAFT NOISE IN THE AREA THERE SHOULD BE DESIGNS TO SU
b) Rural hub		✓			SMALL SHOPPING CENTER w/ SOLE
c) Energy Generation	✓				SOLAR AND SMALL WIND TUBES. CONSIDER THE AMOUNT OF E WIND IN THIS AREA. CREAT WATER RECYCLING.
d) Wastewater Management	✓				
e) Water Capture and Reuse	✓				GRASS WATER RECYCLING
Strategy Feedback					INCREASE TO SUIT POPULATION



A History of Natural Growth

1958



1985



Crystal Brook is a dynamic and evolving place which has been intentionally cultivated and reshaped over recent decades. From cleared grazing land in the 1950s, the area has not only seen significant population growth and dwelling construction but also substantial revegetation of previously cleared land.

2000



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2020



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2.1 VISION

At Crystal Brook, community and nature come together as a living landscape.

Inspired by its Foothills setting, residents embrace sustainable design and self-sufficiency.

A creative and organic approach to growth protects its trees, wildlife and tranquil character while welcoming those who seek to share in its rare lifestyle.

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2.2 PRINCIPLES

- ① Crystal Brook is a Living Landscape
- ② Crystal Brook is a Tranquil Escape
- ③ Crystal Brook Grows Naturally
- ④ Crystal Brook is Self-Sufficient
- ⑤ Crystal Brook Values its Community

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1

Crystal Brook is a Living Landscape

Crystal Brooks' natural environment, lovingly restored over generations, is its greatest asset and will be preserved and enhanced into the future. Conservation of native vegetation and protection of trees will be the primary consideration for future development.

All new buildings will offset their impact by providing rehabilitation and space for greenery on every lot.

Over time, new development will achieve a net positive environmental impact by knitting together a continuous green network of habitat reserves, parks, retained trees, private gardens and productive fields.

Active Conservation

Environmentally significant areas on public and private land will be protected and enhanced to form ecological corridors which protect biodiversity and connect residents with nature.

Inclusive Co-Living

Grouped and intergenerational housing with several dwellings on a single lot will be permitted to maximise tree retention and encourage innovative Community Title housing options.

Space for Nature

A 2,000m² minimum lot size will generally apply to new development, ensuring that existing mature trees are retained and allow revegetation which achieves a net increase in tree canopy and green area.



2

Crystal Brook is a Tranquil Retreat

Crystal Brook will remain a place to escape from City life, with a semi-rural character, generous lots, and space for rural pursuits maintained into the future.

Population growth will not be an agent of change; it will allow more like-minded people to enjoy a semi-rural lifestyle without transforming the area into another homogeneous suburb.

Rerouting of through-traffic maintains a quiet and idyllic atmosphere, with space for children to explore and room on every lot to grow vegetables or raise animals.

This semi-rural character will be valued for the diversity and variety it adds to Perth's urban fabric.

Rural Aesthetics

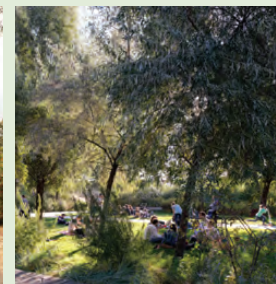
The design of Crystal Brook's, streets, public spaces and buildings will depart from usual practice by incorporating traditional design, local materials, permeable surfaces, natural drainage and an abundance of native landscaping.

Fewer Cars

New roads and revised freight routes will reduce and slow traffic on Crystal Brook Rd to improve safety and encourage active transit supported by new bike paths and walking trails.

Tourism Appeal

Crystal Brook will establish itself as an immersive and unique destination and attract people from around Perth to enjoy its walking trails, natural beauty and rural businesses.



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3

Crystal Brook Grows Naturally

Crystal Brook promotes organic and gradual change over time instead of rapid, short-term development. It does away with the conventional method of large-scale master-planning that locks in development whether landowners want it or not.

Instead, gradual change will be encouraged to occur over time to create a varied fabric of premium housing on spacious lots, intergenerational living, boutique and innovative rural activity, restored natural areas and green infrastructure. This unique planning approach will create a varied, distinct and continually evolving landscape.

Unplanned Planning

Crystal Brook won't have an overarching subdivision plan or fixed population targets, but rather a simple set of rules for individual landowners to follow as part of an organic, site-based approach to growth.

Green Easements

Generous 10m landscaped setbacks will be provided at existing property boundaries where new development is proposed to mitigate visual impact and to accommodate future pedestrian paths and roads where needed.

Responsible Stewardship

Planning will ensure residents who do not wish to develop their properties will not be financially or otherwise penalised for continuing their current way of life as stewards of their land.



4

Crystal Brook is Self-sufficient

Crystal Brook is an international exemplar of environmental sustainability in its truest sense, with emissions reduction and ecological protection prioritised over a conventional settlement pattern as encouraged by the planning framework.

Renewable energy generation, urban agriculture, capturing and recycling of water, treatment of waste and generation of energy will be prerequisites of new growth, minimising reliance on conventional services and infrastructure. Residents are encouraged to provide as much as possible on their own properties to live as self-sufficiently as possible.

Local Economy

A rural hub and eco-business corridor will promote sustainable living and support local economic development, with detailed design standards ensuring these facilities positively complement their surrounds.

Food Production

Local food production will become a key feature of future development with provision of a minimum home garden area for new dwellings and in communal spaces to reduce food miles and encourage productive urban agriculture.

Low Carbon Living

Crystal Brook will become an exemplar for sustainable development and low carbon living. A range of initiatives including alternative servicing, renewable energy generation and building standards will significantly reduce environmental impacts.



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5

Crystal Brook Values its Community

Crystal Brook acknowledges and responds to the different views and needs of its community.

Rather than subject everyone to the intrusive nature of conventional development at a master-planned scale, individual landowners will be given the freedom and flexibility to progress the change they want with a responsibility to ensure they do not burden or disrupt their friends and neighbours.

The views of the community help guide future planning decisions with resident input listened to in the consideration of new development.

Shared Decision-making

While giving landowners individual choice over the level of change they want on their properties, collaborative planning between neighbours and inclusion of the community in the future planning of the area will be promoted and encouraged.

Preserving Amenity

Minimising amenity impacts to long-term residents who do not wish to develop will be given priority where neighbours have differing development intentions.

Local Placemaking

Public art, creative spaces and places for the community to gather and celebrate will be delivered in suitable locations to foster community spirit and wellbeing.





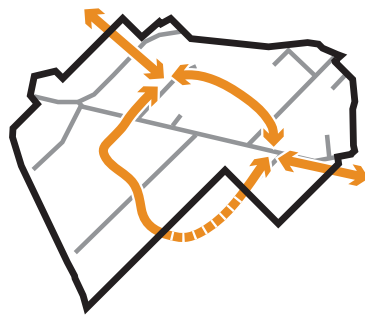
A selection of trees drawn by Co-Design Workshop participants in March 2020.

2.3 CONCEPT PLAN

The Crystal Brook Concept Plan reimagines Foothills living for the 21st Century. It suggests a new way of thinking about urban growth in semi-rural areas, promoting an organic, localised and resident-led approach to development rather than the conventional suburban masterplanning process.

The plan facilitates diverse clusters of low carbon and off-grid housing, situated on spacious lots filled with native vegetation and edible produce, connected by naturalistic roads and trails within an ecologically rich landscape.

Four 'Landscape Residential' typologies are broadly identified to guide development (subject to further planning and consultation) based on community feedback, environmental constraints and preliminary servicing investigations. **Landscape Protection** includes the most significant vegetation and is suited to large lots with a conservation focus. **Landscape Enhancement** is aligned to key ecological corridors and flora of moderate value where re-vegetation is encouraged. **Landscape Transition** identifies areas generally suited to lots in the order of 2,000sqm but requiring sensitive interface treatments. **Landscape Unconstrained** identifies areas where environmental and servicing constraints do not impede development, subject to meeting the strategic objectives of the concept plan.



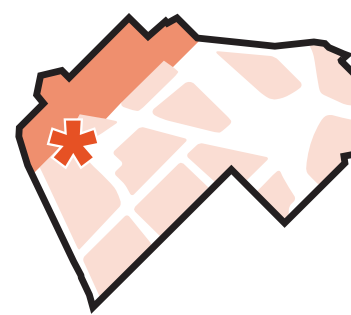
CONNECTIVITY

New connections create a legible and interconnected 'big grid' onto which smaller and less rigid links can be connected over time.



ECOLOGY

Sensitive environmental and infrastructure assets are connected into a biodiverse green network.



ACTIVITY

Large residential lots with productive gardens and home businesses are complemented by a Rural Hub and an eco-business corridor.



DIVERSITY

Residential lot sizes respond to environmental constraints, with larger lots strategically positioned to maximise vegetation retention.



**PLAN 3
CONCEPT PLAN MAP**

- Site Boundary
- Existing Road
- Indicative Key Road Connection
- Residential 1 (Landscape Protection)
- Residential 2 (Landscape Enhancement)
- Residential 3 (Landscape Transition)
- Residential 4 (Landscape Unconstrained)
- Major Service Easements
- Indicative Public Path
- High Retention Value Vegetation
- Moderate Retention Value Vegetation
- Potential Open Space
- Potential Rural Hub
- Gosnells Rural Residential (WAPC Urban Expansion)
- Crystal Brook Foreshore
- Eco Business Corridor (Rural Protection)
- LPS3 AMD 57 Area



0 50 100 300m

2.4 KEY BENEFITS



ECOLOGICAL HEALTH

Protecting and adding trees and native vegetation increases wildlife habitat and sequesters CO²



LIFESTYLE CHOICE

Alternative housing increases the range and diversity of housing options in wider Perth



ACTIVE LIVING

Hiking paths, bike lanes and bridle trails encourage outdoor activity and promote physical health



MENTAL WELLBEING

Access to nature and rural environs has been shown to reduce stress and make people happier



SUSTAINABILITY

Local food production and low carbon development reduces food miles and mitigates climate change



PRODUCTIVITY

Promoting and diversifying rural business activity creates local jobs and promotes innovation



COMMUNITY SPIRIT

Empowering the local community to shape their neighbourhood strengthens identity and belonging



LEAN SERVICING

Off-grid power and limited sewer enables self-development reduces need for government investment.



2.5 SITE CONCEPTS

Central to the Concept Plan is the idea of decentralised planning and landowner-led design. A consequence of this approach is that properties will be planned and developed individually through collaboration between landowners but without the prescriptive guidance of a conventional masterplan.

The following illustrations explore the potential outcomes of this approach at its intended scale: the individual lot. These concepts are based on parent lots which range in size from 1 to 4 hectares (the most common lots in the area today) and explore outcomes resulting from additional lots (generally 2,000m² or above) being progressively added over time.

These concepts confirm that the Concept Plan's guidance will deliver a robust, cohesive and diverse urban structure for Crystal Brook subject to suitable planning controls being established.

CONCEPTS

- 1 Residential (1 ha)
- 2 Residential (2 ha)
- 3 Residential (4 ha)
- 4 Eco Business
- 5 Rural Hub

1 Site Concept Residential Scenario (1 ha)

- 1 20m building exclusion/revegetation area adjacent to road
- 2 Additional street tree planting and native verge landscaping
- 3 Minimum 25m frontage for new lots to preserve streetscape amenity
- 4 Front building setbacks to reinforce semi-rural character
- 5 10m landscaped buffers aligned to original property boundaries
- 6 Designated site-specific building envelopes preserve existing trees
- 7 Minimum productive landscape area (20%) promotes sustainability
- 8 Indirect (non-street) access only where essential to retain trees
- 9 Formal protection of significant vegetation within private land
- 10 Pedestrian and street connectivity extended to promote walkability



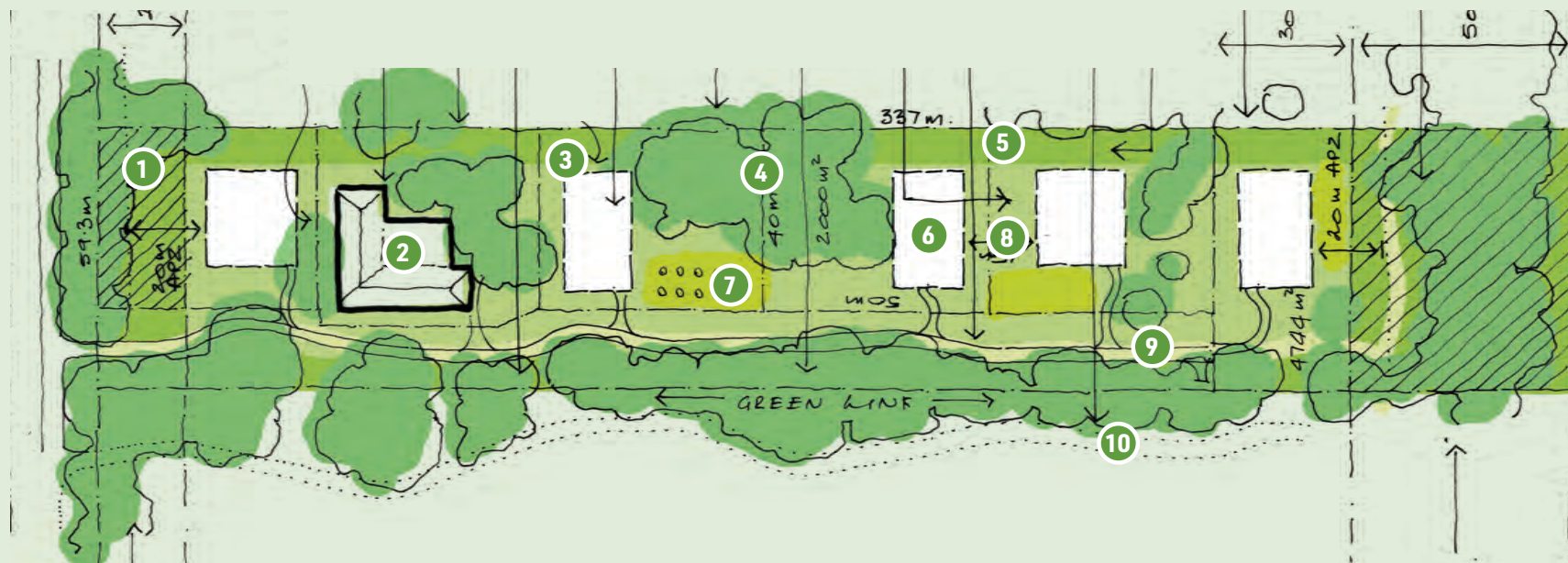
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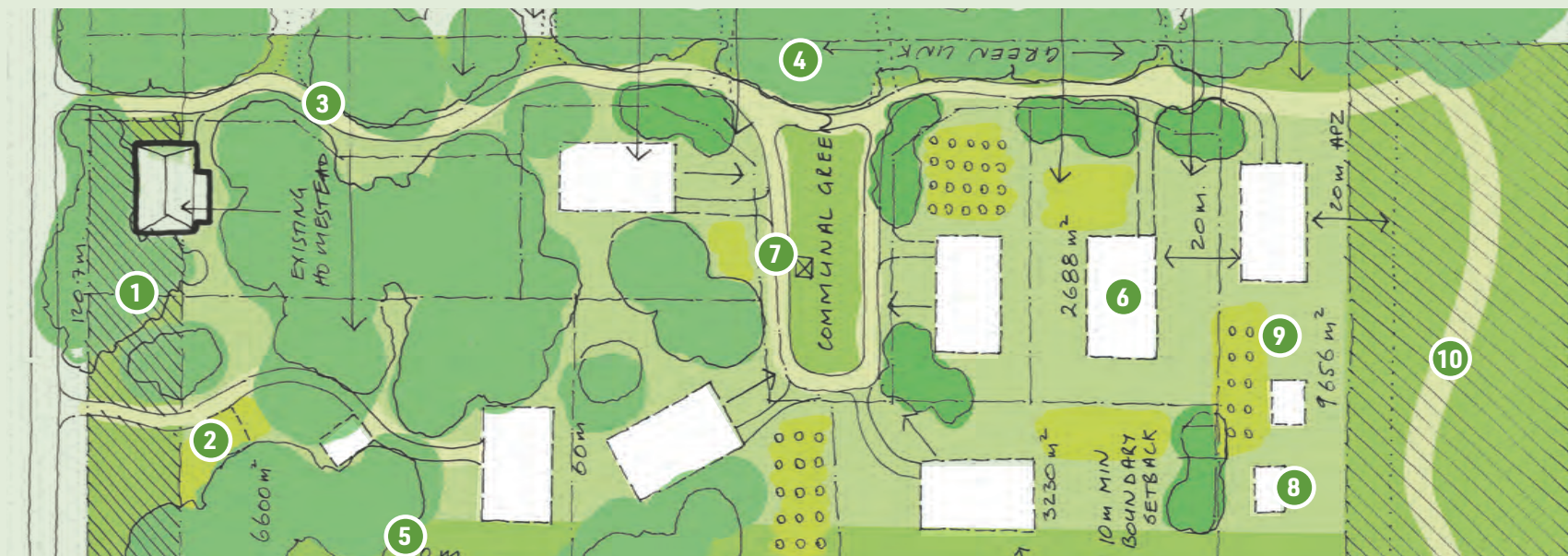
2 Site Concept Residential (2 ha)

- 1 20m building exclusion/revegetation area adjacent to road
- 2 Existing homesteads may be retained by landowners
- 3 Large lot size 50x40m (2000sqm) achieved for new lots
- 4 Retained vegetation parkland cleared to mitigate fire risk
- 5 10m landscaped buffers aligned to original property boundaries
- 6 Designated site-specific building envelopes preserve existing trees
- 7 Minimum productive landscape area promotes sustainability
- 8 Separation between new dwellings maximised
- 9 Meandering and informally paved access road
- 10 Duplicated access on adjacent lot allows upgrade to public road

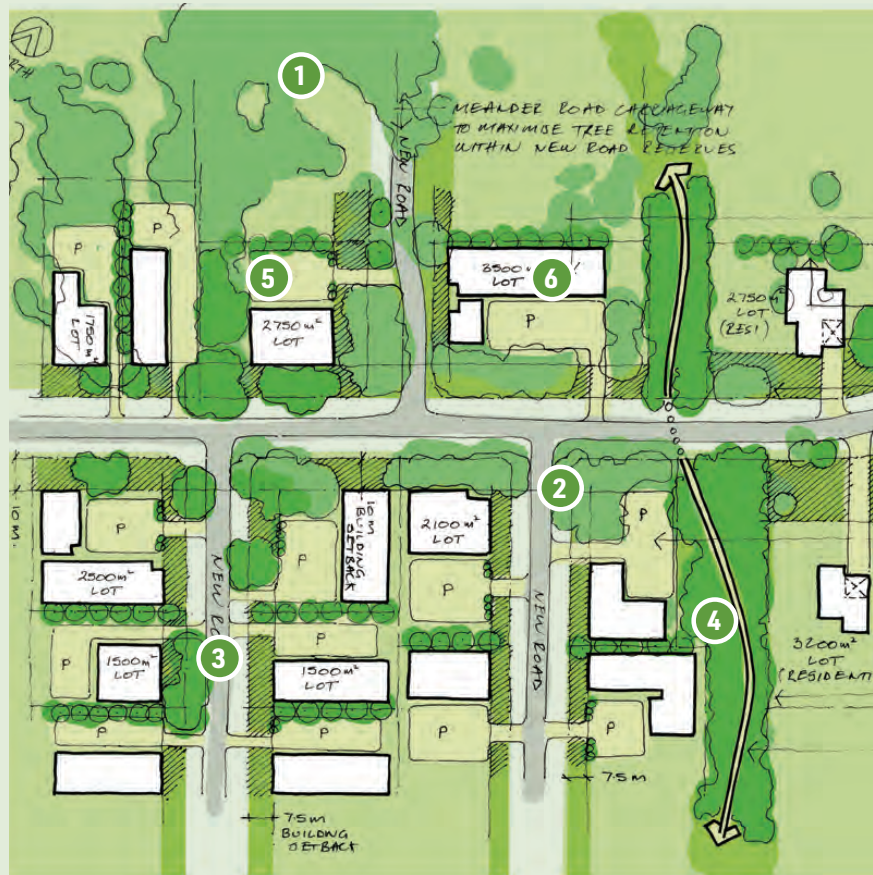


3 Site Concept
Residential (4 ha)

- | | | | | | | | | | |
|----------|---|----------|---|----------|--|----------|---|-----------|--|
| 1 | 20m building exclusion/
revegetation area
adjacent to road | 2 | Limited development/
wide frontages to
existing roads | 3 | Meandering road
maximises tree
retention | 4 | Preservation of green
links along boundaries | 5 | 10m landscaped buffers
aligned to original
property boundaries |
| 6 | Designated site-specific
building envelopes
preserve existing trees | 7 | Clustered smaller lots
around central green
(community title) | 8 | Tiny houses and
intergenerational/
holiday accommodation | 9 | Larger lots adjacent to
significant vegetation/
POS corridors | 10 | Pedestrian walking trails
in linear POS corridors
or private easements |



4 Site Concept Eco Business



- 1 Building area limited to ensure site remains rural consistent with State Government planning
- 2 Intensive natural landscaping (understorey and windrow) to all lot boundaries
- 3 Increased vegetation and building setbacks along streets
- 4 Replanting/wilding of cleared land to create new habitat corridors and pedestrian links
- 5 Parking areas to side and rear of businesses and heavily screened to preserve rural character
- 6 Building scale, design and permissible uses strictly controlled to be compatible with surrounding character



5 Site Concept Rural Hub



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- 1 Community facility/civic structure on high profile corner e.g. community hall, childcare
- 2 Separate vehicle access and screened/heavily vegetated parking areas
- 3 Built form and architectural standards control scale, character and maintain a distinctive semi-rural feel
- 4 Additional landscaping and productive gardens/orchards feed into local businesses
- 5 Alternative retail model as a focal point, informal clustering of small scale rural businesses framing a flexible public space
- 6 Plan controls strictly limit size and types of uses to be compatible with residential and natural surrounds



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A Future of Natural Growth

2020



2025



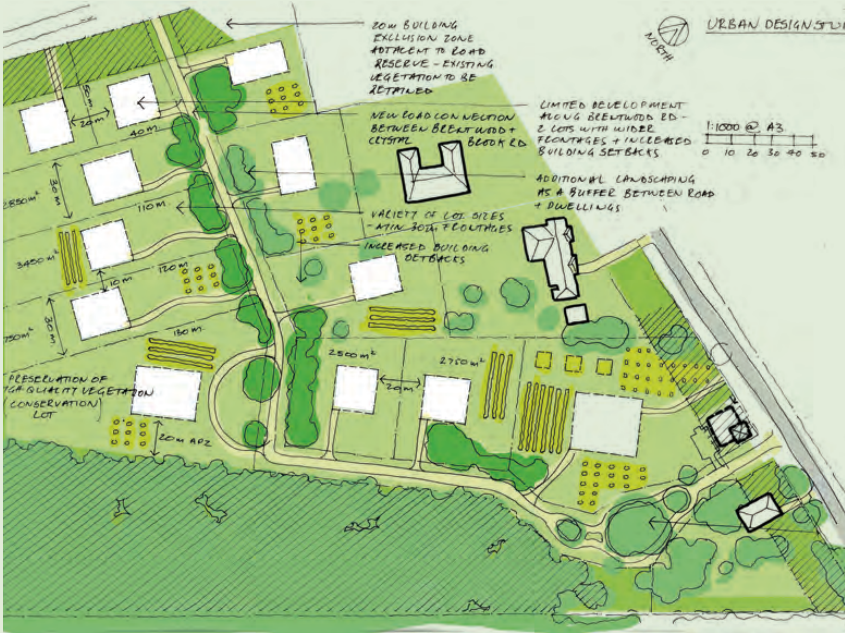
The Concept Plan seeks to guide and support Crystal Brook’s established pattern of natural growth. It is not intended to promote rapid development focused on a static end state. To deliver this vision, controlling how growth occurs will be just as important as controlling what growth looks like.

2030



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2040



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3.1 PLANNING RATIONALE

The North-East Sub-regional Planning Framework suggests that, as an 'Urban Expansion' area, the site (excepting environmentally sensitive areas) should be consolidated for medium density development at 15 dwellings per gross urban zoned hectare by 2050, yielding approximately 4,200 dwellings.

While prepared with regard State and Local planning policy, the Concept Plan proposes a series of significant variations to urban form and residential density, based on site-specific constraints and landowner feedback. These departures are supported by the satisfaction of the City's density targets in other development areas which provides some flexibility for Crystal Brook (Draft Kalamunda Housing Strategy 2020).

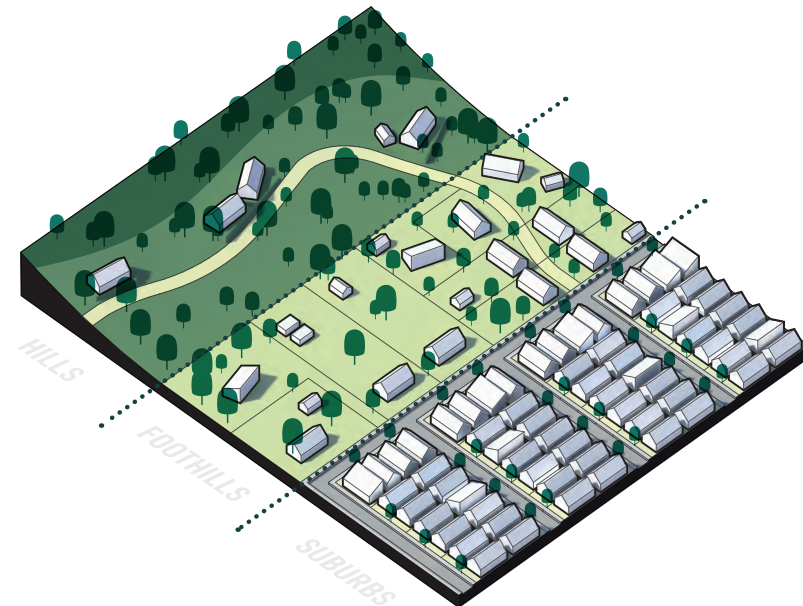
While further detailed planning will demonstrate planning compliance to the level of detail required, the variations proposed by the Concept Plan are considered to be well-reasoned and justifiable on a first principles basis.

Contributing to Regional Housing Diversity

While the negative impacts of new rural-residential development on productive rural land is widely recognised, established rural-residential areas are a finite resource with considerable environmental and lifestyle value. The Concept Plan proposes to maintain this semi-rural structure while accommodating intensification, rather than subsume the area into its surrounding suburban fabric. This promotes lifestyle choice and housing diversity at all scales.

Prioritising Sustainability and Design Excellence

Sustainability and good design are widely cited as important planning principles, yet are rarely delivered in practice due to their impacts on project feasibility and first homebuyer affordability. Based on the aspirations of local landowners, the Concept Plan prioritises these outcomes. While this impacts achievable ultimate population density, this is offset by significant social and environmental benefits.



CURRENT CONDITIONS

Today, Crystal Brook is a bucolic semi-rural environment situated between the natural setting of the Darling Scarp and the suburban form of eastern Perth. While it may be seen as lacking diversity when viewed in isolation, it can alternatively be considered as contributing to the diversity of the wider region as distinct zone between natural and urban areas consistent with the principles of the Urban Transect and traditional patterns of local development.



BUSINESS AS USUAL

Application of standard planning principles would likely see the area developed into a practical but conventional residential suburb. While this would support infill development targets, its contribution to housing diversity is questionable considering its homogeneity. Such a transformation would also come at the expense of the area’s significant tree canopy and fauna habitat, economically productive rural business activity as well as its valued Foothills character and identity.



CONCEPT PLAN APPROACH

The Concept Plan balances the valued qualities of the site today with the planning needs of the future. It accommodates considerable growth, albeit less than policy expectations and tied to standards which may increase development cost. However, this enables a net increase in tree canopy and achieves an unprecedented level of sustainability, self-sufficiency and design excellence while preserving a valued alternative lifestyle for current and future residents.

3.2 TECHNICAL CONSIDERATIONS

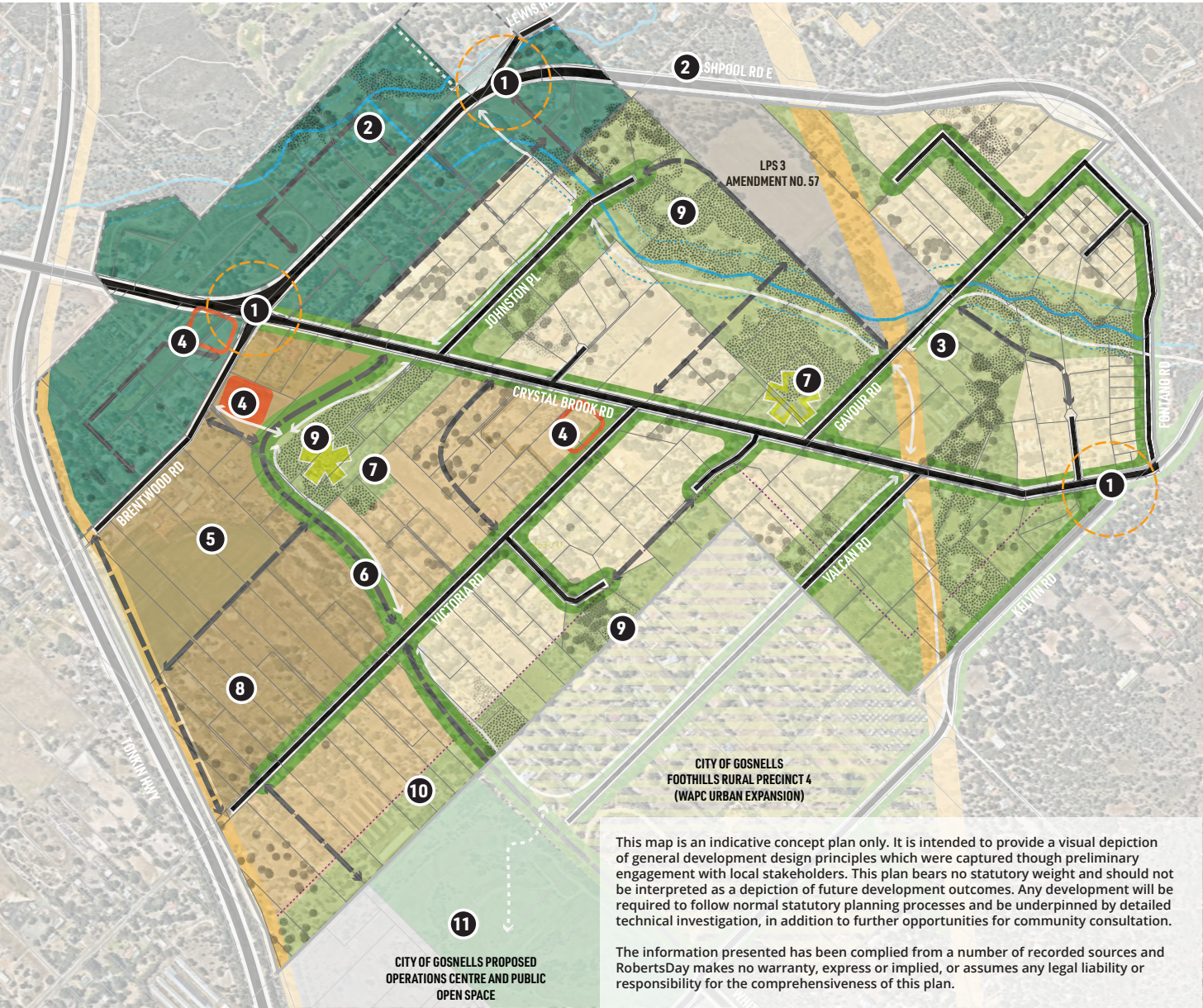
While the Concept Plan suggests a decentralised approach to planning and development, this does not diminish the importance of achieving a cohesive and functional overall urban outcome.

It is therefore essential that critical design outcomes are identified and delivered through the planning framework, with individual development decisions contributing to the delivery of these broader objectives.

Central to this are detailed matters of infrastructure provision and funding, land tenure, environmental management and governance arrangements, all of which will require further detailed consideration though future stages of planning.

Key technical considerations and underlying environmental and infrastructure constraints are shown on the plan opposite.

- 1 Primary vehicle entries require modified intersection treatments to address traffic movement issues, subject to further detailed investigations at a later date.
- 2 Limited new road connections to Welshpool Rd East but connectivity at Lewis Rd and further east preferable.
- 3 Development may not be possible on constrained land including landscape protection areas, Crystal Brook foreshore, powerline easement and vegetation linkages.
- 4 Preferred Rural Hub fronting Brentwood Rd. Possible alternative locations with Welshpool Rd East and/ or Crystal Brook Road frontages (not preferred).
- 5 Lot sizes to transition away from landscape protection areas with sizing subject to future planning and consideration of sewer servicing feasibility.
- 6 Proposed new road linkages to improve connectivity and precinct permeability to be mandated in agreed locations.
- 7 Opportunity for Public Open Space to provide active recreation amenity. POS incorporates areas of higher value conservation areas and co-located with Rural Hub.
- 8 Potential need for Primary School subject to ultimate residential densities and further Department of Education liaison. Co-location with Rural Hub preferred.
- 9 Protection of high retention value vegetation clusters in POS or within private ownership to be investigated further.
- 10 Interface and buffer with Gosnells Rural-Residential precinct to be further investigated.
- 11 Preliminary City of Gosnells concept for operations centre and public open space at Kelvin Road may help meet regional active space demand.



3.3 FURTHER INVESTIGATION

This Concept Plan and associated implementation strategies are preliminary ideas only which require further planning investigation, liaison with key decision-makers and incorporation into formal planning instruments before they can be given effect.

The plan is focused within a defined area and changes beyond the agreed boundary will need to be considered via a separate planning process.

Many of the concepts put forward by this plan require the approval of the City of Kalamunda Council and consent of the Department of Planning, Lands and Heritage before they could be established in a formal planning document.

As this is a pre-statutory vision and concept document based on community consultation and preliminary technical review, it must be made clear that these outcomes are not assured and will require significant justification and planning assessment if they are to be formally adopted. Moreover, they will require a significant commitment on the part of

all levels of government and the local community to drive and advocate for the innovative outcomes envisaged.

As these outcomes are not guaranteed, it should be recognised that alternative implementation strategies and design outcomes will need to be explored to deliver the vision should elements of the plan ultimately not proceed due to their practicality, financial feasibility or alignment with current policy.

Additionally, there are a number of key issues which will require further investigation and detailed planning to ensure a feasible and robust outcome.

Sustainability Requirements

The Concept Plan and supporting strategies encourage low carbon living and off-grid/limited servicing. Specific implementation mechanisms and development standards to be determined and feasibility considered.

Servicing Methodology

The Plan assumes sustainable on-lot sewer disposal within lots no smaller

than 2,000sqm in order to suitably meet servicing needs without need for deep sewer. Detailed feasibility assessment required.

Residential Densities and Lot Size

The Plan assumes minimum 2,000sqm lots with 1-3 dwellings per lot. Feasibility and urban impacts of this approach to be more fully considered through detailed planning with ultimate lot sizes and density coding to be reviewed through future planning subject to sewer availability.

Public Open Space Provision

Concept plan indicatively identifies preferred POS locations alongside significant environmental areas. Need for these areas to be vested as public space to be further considered and alternatives explored (e.g. private access easements) and overall POS expectations (i.e. 10% gross) to be determined.

Road Network Expansion

Concept plan identifies macro grid and key access points which require detailed traffic impact assessment to determine suitability. Mechanisms for

delivering lower-order connections without coordinating subdivision plan also require further planning consideration.

School Site and Other Services

Community need for public services, particularly a Primary School site, to be further considered through population growth scenario modelling.

Governance and Implementation

Suitable planning controls and design guidance to be developed and implemented through appropriate statutory planning instrument/s.

Rural Hub Delivery

Investigation of feasibility to be undertaken and detailed design concept to be prepared and adopted as statutory control to ensure an acceptable outcome is realised.

Bushfire Risk

A non-standard approach to fire management will be required to facilitate vegetation retention while permitting densification and should be investigated at a precinct level.

3.4 CASE STUDIES

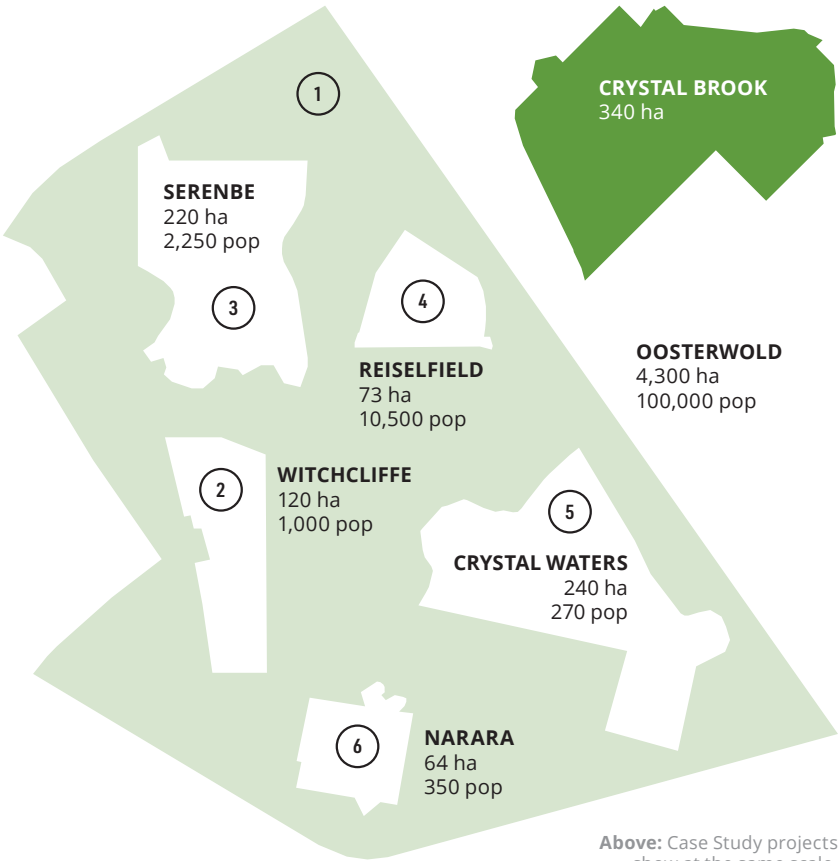
The following case studies reflect leading planning practice globally in the areas of ecological preservation, sustainable urban development and off-grid living.

They have been selected based on their alignment to the Concept Plan, in reflecting many or all of the key planning and design concepts outlined in this document.

The case studies span a range of locations globally, nationally and locally in Western Australia. They demonstrate a wide range of scales and population densities, demonstrating the feasibility and diversity of development outcomes achievable within the parameters of this Concept Plan.

Importantly, they also confirm that the strategies and principles of the Concept Plan are technically feasible and financially viable with all case studies reflecting actual developments which are completed or under construction with relevant planning approvals in place and servicing arrangements resolved.

It is anticipated that further planning for the Crystal Brook area may be supported by detailed review and investigation of the planning instruments and governance structures which have supported the realisation of these innovative case study projects.



Above: Case Study projects show at the same scale.

1 Oosterwold, NL



Oosterwold is radical experiment in bottom-up rural land development. Located at the rural periphery of Amsterdam, the planning framework is based on the principle of “DIY Urbanism” with no official masterplan for the site but instead a series of guiding principles programming how the land can be developed. 59% of the land is designated for urban agriculture, 18% for building envelopes, 8% roads, 13% POS, and 2% drainage. Accompanying the guiding principles are a set of rules on construction, irrigation, agriculture and road connection.

Government facilitates rather than coordinates, with landowners having the responsibility to plan for appropriate infrastructure and services in collaboration with their neighbours. The guiding principles and rules are designed to promote differentiation in development and preserve the natural landscape.

2 Witchcliffe, WA



Witchcliffe Ecovillage is a highly sustainable, self-reliant community in a regional South West WA. Drawing on permaculture principles of “earth care, people care, and fair share” this environmentally caring community is self-sufficient in renewable energy, water and fresh food produce that put emphasis on restoring and protecting indigenous flora and wildlife habitats.

Featuring bike and pedestrian friendly networks, extensive community gardens, waste management systems, Witchcliffe Ecovillage aspires to be a healthy, socially diverse yet inclusive egalitarian community. The Village Square is the heart of the townsite, with facilities including a commercial precinct and tourist accommodation.

With initial stages under construction as of 2020, Witchcliffe is emerging as a nationally significant exemplar of sustainable growth.

3 Serenbe, USA



Serenbe is a community in Atlanta, Georgia which comprises of 3 distinct hamlet urban villages. 70% of the land is protected for conservation while the remaining 30% is filled with a comparatively dense neighbourhood of homes, shops, restaurants, schools and other amenities. Streets are designed to follow the contour of the landscape and homes are designed with different architectural styles, with front porches facing common green space and trails.

Local shops and services are provided to encourage walking. Homes are energy efficient and solar passive with their own waste management systems. Serenbe is also home to many local small-scale agricultural businesses that practice sustainability and biophilic principles. Its diverse and intergenerational residents enjoy a rural lifestyle with urban amenities.

4 Reiesfeld, GER



Reiesfeld is a new community district in Freiburg developed which balances green space, sustainability and higher density development. Situated within a 250-hectare nature reserve which surrounds the community, 3 to 5 storey low energy and buildings are organised in grid layout with generous open spaces between buildings.

Homes are solar powered and other renewable energy systems such as solar thermal, district heating and combined heat and power plant, and water recycling systems are integrated into the design of the community. Local facilities like childcare, school, retail, restaurants, and commercial spaces are located along Reiesfeld's traffic-calmed streets that are landscaped with diverse local flora. Cycling and walking is also encouraged as result of most roads being pedestrian and cycle priority.

CITY OF KALAMUNDA

5 Crystal Waters, QLD



Crystal Waters demonstrates an alternative way of living that is low impact on the environment and designed with social and environmental responsibilities in mind. Residential lots are grouped together in small clusters that allows for social interaction with other residents. The Village Green is the social hub of the community, used for regular monthly markets and as a performance and meeting place. Part of the Village centre is zoned for commerce, light industry, tourism and educational activities that are locally organised, owned and managed.

Water is harvested and managed through a system of dams and water collection from run-off which is then recycled. Buildings make use of renewable materials and are solar passive. Only 1 hectare is taken up by individual owned lots with the remaining land set aside for conservation and recreation.

6 Narara, NSW



Narara is an intergenerational ecovillage that aspires to be socially, environmentally and economically sustainable. All homes are being built to a minimum NatHERS 7 star standard, with PV solar panels being installed in each dwellings to meet all energy needs, and water management systems that can handle waste water collection and treatment on site. The layout of the design encourages neighbourly interaction while respecting people's privacy.

Approximately 12 hectares are zoned for residential development with another 12 hectares available for agriculture and common gardens. The remaining site is set aside as are native bushland. The village includes a visitor centre, offices, greenhouses, and workshop spaces. The site has easy access to local buses, the Sydney-Newcastle rail line and is close to local shops, schools, retail and commercial facilities.

RESET WATTLE GROVE SOUTH

49

3.5 IMPLEMENTATION STRATEGIES

The following implementation strategies are suggested ways that the Concept Plan’s vision and principles can be implemented through the planning and development framework. This range of practical measures are intended to be employed together to ensure that community expectations for the future of the area are met.

In some cases, strategies have been developed directly from stakeholder feedback. Others have been developed by the project team as an interpretation in response to planning constraints, environmental considerations and other technical design matters.

Many strategies are relatively novel in the Perth planning context but successful examples of their application exist elsewhere in Australia and globally. planning in Perth.

The innovative nature of the strategies reflects the considerable community interest in ‘pushing the envelope’ to achieve a unique and word-leading outcome at Crystal Brook.

The following strategies preliminary only and are have not been reviewed or endorsed by the City of Kalamunda. They should be considered a guide to further planning, technical investigations and community consultation.

While the strategies span a wide range of land use, subdivision, design guidance and environmental considerations, they have been grouped based on their relationship to the Draft Principles to help show the direct connection between community feedback, the vision and these strategies.

STRATEGIES

- 1 Crystal Brook is a Living Landscape
- 2 Crystal Brook is a Tranquil Escape
- 3 Crystal Brook Grows Naturally
- 4 Crystal Brook is Self-Sufficient
- 5 Crystal Brook Values its Community

1 Crystal Brook is a Living Landscape

POSSIBLE STRATEGY	DESCRIPTION
a) Minimum Lot Sizes and Ranges	Set a minimum lot size based on engineering/servicing requirements, precedent in area and tree retention feasibility (i.e. 2,000sqm) with specified ranges set in certain areas to ensure diversity.
b) Grouped Housing	In limited areas, explore opportunity for eco-village or similar typologies which group development within a smaller area to maximise the land reserved rural or ecological purposes.
c) Tree Canopy Protection Standards	Establish a formal planning requirement to survey, assess and retain on site trees to strengthen protection of trees and limit clearing associated with development.
d) Rehabilitation Requirements Incentives	Require that a minimum percentage of a site be replanted with native species as part of any development to actively improve local biodiversity.
e) Reservation of Crystal Brook Creek	Require sensitive foreshore areas abutting Crystal Brook to be set aside an area of land for conservation, water management and public enjoyment. Or alternatively ensure its preservation by the landowner.
f) Public Space Creation for Conservation	Identify land to be formally conserved where Environmental Assessment shows Threatened Ecological Communities or Declared Rare Fauna
g) Fauna Conservation/ Management Plan	Develop a plan to protect local wildlife with supporting strategies such as managing fencing and other barriers to allow bandicoots, reptiles and birds to move freely between vegetated areas.
h) Street verge enhancement	Make use of public verges to provide infill tree planting and native landscaping to support biodiversity.

2 Crystal Brook is a Tranquil Escape

POSSIBLE STRATEGY	DESCRIPTION
a) Rural Character and Aesthetics	Ensure subdivision and construction of new housing is managed in a low impact way which maintains a rural-style, supported by detailed design guidelines that reflect an Australian vernacular. For non-residential development, Set clear design guidelines and define permissible activities to ensure integration with area.
b) Rural Business Guidelines	Continue to allow boutique rural businesses but provide specific guidance potentially including an approved list of acceptable activities and strong amenity and design quality controls.
c) Home gardens and self-production	Promote self-sufficiency by requiring new homes to provide for urban agriculture, vegetable gardens, orcharding or other productive rural pursuits at a small scale.
d) Tourism Opportunities	Identify tourism, accommodation and recreational activities consistent with the area's rural character that could promote a 'foothills' tourism experience and create economic development opportunities
e) Walking/Bridle Trail	Explore potential to establish a landscaped walking/bridle trail connecting the Crystal Brook area to surrounding trails in the region
f) Sensitive street design	Ensure new streets are only constructed where absolutely necessary and adopt a low-impact design ethos. In other cases, informal strata access points can be used instead of roads.
h) Traffic Diversion	Explore alternative traffic management measures to reduce amenity impacts of heavy traffic on Crystal Brook Road.

3 Crystal Brook Grows Naturally

POSSIBLE STRATEGY	DESCRIPTION
a) No traditional Subdivision Plan	Rather than usual practice of preparing an overarching subdivision pattern crossing over properties that all landowners must follow, manage development within a flexible framework that focuses on key minimum lot size ranges and sustainability standards.
b) Site-based planning process	In lieu of an overarching design masterplan, promote site-specific planning by landowners within a wider guiding framework to manage change on a per-lot basis that reduces impacts on neighbours.
c) Green setbacks and interfaces	Adopt a principle of independent lot development with green buffers at shared boundaries to avoid impacts to adjoining landowners as an alternative to conventional planning.
d) Reward responsible land stewardship	Investigate ways of rewarding people for maintaining large lots in good condition and set stricter requirements for smaller lots with less onerous standards for large properties.
e) Promote landowner-led change	Support and equip landowners to be able to progress more sensitive development opportunities on their own land if they wish without requiring the involvement of large developers.
f) Avoid targets and timelines	Do not establish minimum densities, growth targets or timelines that would compel growth. Focus on ensuring growth is sustainable and reflects the desire of landowners.

4 Crystal Brook is Self-Sufficient

POSSIBLE STRATEGY	DESCRIPTION
a) Housing Construction Standards	Establish high standards for housing construction and thermal performance to reduce carbon impact in construction and ongoing operation.
b) Rural Hub	Identify a suitable location where existing and related rural activities can be transitioned to a higher amenity and community-focused service hub to reduce vehicle trips, promote walking and cycling and reduce food miles and carbon emissions while preserving the amenity of surrounding areas.
c) Energy Generation	Promote opportunities for off grid solar and wind generation and storage within individual properties and at a wider collective scale to minimise use of grid power.
d) Wastewater Management	Work on the presumption that deep sewer will not be provided some areas and explore alternative sustainable septic/filtration systems with supporting guidelines and standards.
e) Water Capture and Reuse	Establish minimum standards for rainwater tanks to meet resident needs and establish variable standards for water recycling as well as encouraging blackwater filtration.
f) Sustainable Transport	Integrate cycling paths along key roads and connecting to surrounding areas to promote cycling-based local trips, provide future-proofing for electric cars and promote improved public transport.

5 Crystal Brook Values its Community

POSSIBLE STRATEGY	DESCRIPTION
a) Resident Amenity Principle	Work to a principle of limited disturbance of surrounding properties when considering future land use decisions to protect existing lifestyle/amenity and manage the reality of landowners' differing intentions.
b) Landowner Choice	Allow individual landowners to determine the level of change they want on their property (within agreed principles) and encourage neighbour collaboration.
c) Consultative Decision-making	Promote means of community collaboration to ensure high level of engagement with any future planning of the area.
d) Development Approval Presumption	Presume that most proposals for development will require public advertising and individual assessment to ensure standards are being met and provide the community with an opportunity to have a say in the process.
e) Local Placemaking	Establish quality-of-life supporting community facilities such as an arts studio, mens' shed or communal park with pizza oven. Encourage the installation of artworks by local artists within private and public land.



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