

GREATER CURTIN MASTER PLAN

PART B

**CREATING THE CITY
OF INNOVATION**



Curtin University is a trademark of Curtin University of Technology. CRICOS Provider Code 00301J (WA), 02637B (NSW)
© Curtin University 2014

This document has been printed by a Forest Stewardship Council® (FSC®) chain of custody certified printer on a mixed sources stock FSC® certified, ensuring fibres are sourced from certified and well-managed forests.



Disclaimer

Information in this publication is correct at the time of printing but may be subject to change. This material does not purport to constitute legal or professional advice.

Curtin accepts no responsibility for and makes no representations, whether express or implied as to the accuracy or reliability in any respect of any material in this publication. Except to the extent mandated otherwise by legislation, Curtin University does not accept responsibility for the consequences of any reliance which may be placed on this material by any person.

Curtin will not be liable to you or to any other person for any loss or damage (including direct, consequential or economic loss or damage) however caused and whether by negligence or otherwise which may result directly or indirectly from the use of this publication.

© Curtin University 2014

Except as permitted by the *Copyright Act 1968*, this material may not be reproduced, stored or transmitted without the permission of the copyright owner. All enquiries must be directed to Curtin University.

Contact

Andy Sharp
Director Properties, Facilities & Development
Curtin University
Kent Street Bentley WA 6102
GPO Box U1987 Perth WA 6845
Tel: +61 8 9266 4428
Email: andy.sharp@curtin.edu.au

Document Control

The Greater Curtin Master Plan (Part B) has been prepared by the Curtin City Project Group consisting of AECOM, Arup, Block Branding, CBRE, Donaldson and Warn, Pracsys and Syrinx Environmental PL.

Second edition

Approved by: Andy Sharp

Director Properties, Facilities & Development

Date: 19/03/2014



GREATER CURTIN MASTER PLAN

PART B

**CREATING THE CITY
OF INNOVATION**



CHANCELLOR'S FOREWORD

Curtin University is an institution with an incredibly bright future. It brings together the very best minds in research and teaching and has created a vision for the future that aims to bring prosperity to all Western Australians. Curtin is building upon an area that already possesses the largest concentration of innovative industry and research in the State. We aim to create an important economic and innovation hub with a rich diversity in culture and the arts – a district that celebrates our creative knowledge. Curtin is committed to pursuing this goal with and for the citizens of Perth and Western Australia so that we may become a globally competitive knowledge economy.

Greater Curtin is a visionary plan for our future. It is a bold and exciting plan that sets out the transformational changes required to bring together the world's best minds to solve real world problems. We envisage Greater Curtin to be 'the place' to rub shoulders with some of the most dynamic and exciting businesses and community groups in Australasia. It will be a place where large and small businesses and entrepreneurs can exchange knowledge – a place where creative relationships are forged between colleagues. Greater Curtin will give the community, students and companies a unique opportunity to conceive and develop ideas and technologies – a place where innovation and opportunity coexist ready for the taking.

The University has prepared this master plan as the first step in showcasing the very best in urban planning and design. We are forging strong relationships with business and government to ensure our goals and aspirations meet the demands and changing face of university education and delivery. We have every desire to create an urban centre that will become a hub of innovation and research. Greater Curtin is set to develop into one of the most dynamic districts conceived for the benefit of Perth and Western Australia. We invite you to join with us in making this a truly globally competitive knowledge centre – a Greater Curtin.

COLIN BECKETT

CHANCELLOR
CURTIN UNIVERSITY



VICE-CHANCELLOR'S FOREWORD

If the role of the university is to look ever forward, to challenge and to create opportunities for its citizens by finding new and better ways of understanding our world, then Curtin University exceeds these aspirations by bringing to life the Greater Curtin initiative.

Our vision for a knowledge hub defined by the synergies of research, business and entrepreneurial enterprise forms the basis of the Greater Curtin proposal. Our plans for an urban centre will deliver significant opportunity for a wide range of knowledge industries, business and research groups and will extend to help position Western Australia as a key knowledge economy in Australia and Asia.

Greater Curtin is underpinned by a broad spectrum of innovation and delivers on four key network strengths;

Education and Innovation Network – Meeting the demands of future generations will require Curtin University to provide contemporary courses and research capabilities that closely align with community and business expectations. Greater Curtin will become the centre of research and innovation in Western Australia, blending new practices for entrepreneurship with business and industry partners.

Social and Cultural Network – With one of the largest humanities faculties in Western Australia, Greater Curtin will be the place where arts and culture meet technology and innovation. We seek to become the creative hub for Perth and an attractive vibrant destination for the community.

Urbanisation Network – Greater Curtin will support an urbanisation economy based around public transport, dense residential and high participation rates of knowledge workforce and visitor populations. In the spirit of great urban places, Greater Curtin will serve its community as a living laboratory where technology and research are visible and accessible to everyone.

Business and Research Network – A collection of visionary companies and researchers already exists in Bentley, and Greater Curtin seeks to leverage this critical mass to form new business and research opportunities – multiplying the number of innovative companies within Western Australia. The Greater Curtin project will demonstrate the network benefits offered to entrepreneurial business and researchers by the promotion of fresh ideas and collaboration between new and existing innovators. Greater Curtin is planned to contribute an estimated \$4.5B in annual output to the State economy when fully developed, comprising knowledge exports, value-added industry and significant wages income.

These exciting networks provide solid foundations for Curtin University and form the cornerstone from which Greater Curtin is implemented. We invite all Western Australians to be part of Greater Curtin and to participate in making Curtin University a leading light in research and innovation for this and future generations.

DEBORAH TERRY

VICE-CHANCELLOR
CURTIN UNIVERSITY



CURTIN UNIVERSITY HAS EMBARKED ON AN AMBITIOUS JOURNEY TO TRANSFORM ITSELF FROM AN ISOLATED SUBURBAN UNIVERSITY INTO A VIBRANT CITY UNIVERSITY DEFINED BY THE SYNERGIES OF RESEARCH, BUSINESS AND ENTREPRENEURIAL ENTERPRISE.



EXECUTIVE SUMMARY

Building upon the Western Australian Planning Commission's Directions 2031 and Beyond (2010), together with State Planning Policy 4.2 (SPP4.2), Curtin University's Bentley campus is located within a strategically important Specialised Activity Centre where the synergies of research, learning and industry links align to form strong and successful urbanisation economies. Curtin is uniquely positioned to take advantage of the existing synergies within the Bentley-Curtin district by maintaining a core focus in research and the synergistic relationships that exist between contemporary universities and business innovation. It is within this context that the transformation of Curtin University into a successful knowledge hub contributing to the ongoing development of Western Australia becomes most apparent. The Greater Curtin proposal builds economic diversity and long-term knowledge transfer for the citizens of Western Australia by retaining land ownership with the university and focusing in key areas of strength:

Innovation – The interface between business and universities is driving the transition of traditional university campuses towards integrated innovation precincts, where academic researchers, private business and government agencies work collaboratively to develop educated workforces and new processes, services and products for the whole community.

Knowledge Networks – Successful innovation occurs through collaborative knowledge networks, where access to large university populations enables the development of new ideas on problems that span faculties and industries. The effectiveness of knowledge networks is directly linked to the number and strength of connections, creating potential opportunities for developing export goods and services that solve real world problems and have widespread commercial application.

Agglomeration Economies – High quality economies of agglomeration arise when a significant concentration of firms and researchers co-locate, creating improved productivity benefits through:

- Input sharing – where similar types of enterprises group together to share labour, sources of capital, entrepreneurial skills, infrastructure and facilities
- Knowledge spillovers – where related firms share technical and commercial knowledge, both formally and informally to enhance productivity
- Labour market pooling – where skilled workers group together to access high paying, high productivity jobs – often moving between enterprises
- Urbanisation effects – where large agglomerations become their own urban economies, based around high quality amenity supported by dense residential, workforce and visitor populations.

Greater Curtin has the capacity to operate as a high value location for knowledge-based business and enterprise – one of the most important drivers of Western Australia's economic performance.

Urbanisation Effects – A high quality urban environment accommodating goods, services, entertainment, recreation and accessibility aids the attraction and retention of a diversity of user groups – including employees, residents, students and visitors. In a competitive economic environment, Greater Curtin can help attract greater numbers of students, researchers and associated entrepreneurial businesses seeking high quality alternatives to the Perth CBD for knowledge-based enterprise.

Housing – A diversity of accommodation options is a core component of successful urbanisation economies. By providing study/live/work opportunities employment self-sufficiency rates are greatly improved and car-based congestion to other employment centres such as Perth CBD are reduced. Less travel time for resident workers means higher productivity and efficiency, and the diversity of user groups within the precinct at different times contributes to greater economic activation, retail success and safety.

Public Transport including Light Rail – The establishment of an integrated bus and light rail network to Greater Curtin will amplify the productivity benefits associated with Perth's specialised activity centres. Face-to-face interaction linking Curtin University to Perth CBD via high quality public transport will strengthen and broaden business and research networks. Greater connectivity to the CBD will improve Curtin's attractiveness to commercial enterprise and the associated research and commercialisation spin-offs that apply.

Greater Curtin establishes for Perth a research and innovation district based on best practice urban planning and design principles. The growth and development of Curtin University will have positive widespread impact for the citizens of Western Australia by the attraction and creation of high quality jobs, innovative businesses, smart people, and international researchers and students providing generational benefits to every West Australian.





1.0 INTRO- DUCTION

PAGE 10

1.1 PROJECT CONTEXT

1.2 PLANNING CONTEXT

1.3 DEVELOPING THE
MASTER PLAN

2.0 DEFINING GREATER CURTIN'S DNA

PAGE 20

2.1 WORKING WITH
MEMORIES AND SYSTEMS

2.2 LAND

2.3 CULTURES

2.4 STRUCTURING
ELEMENTS



3.0 BRINGING INNOVATION TO LIFE

PAGE 50

3.1 VISION

3.2 PRINCIPLES

**3.3 GREATER CURTIN:
TRANSLATING THE VISION**

4.0 UNDERSTANDING THE LAYERS

PAGE 72

4.1 INTRODUCTION

4.2 ACTIVITY AND DELIVERY

4.3 MOVEMENT

4.4 FUTURE SYSTEMS

**4.5 LAND USE SPATIAL
PLANNING DOCUMENT**

4.6 PUBLIC REALM

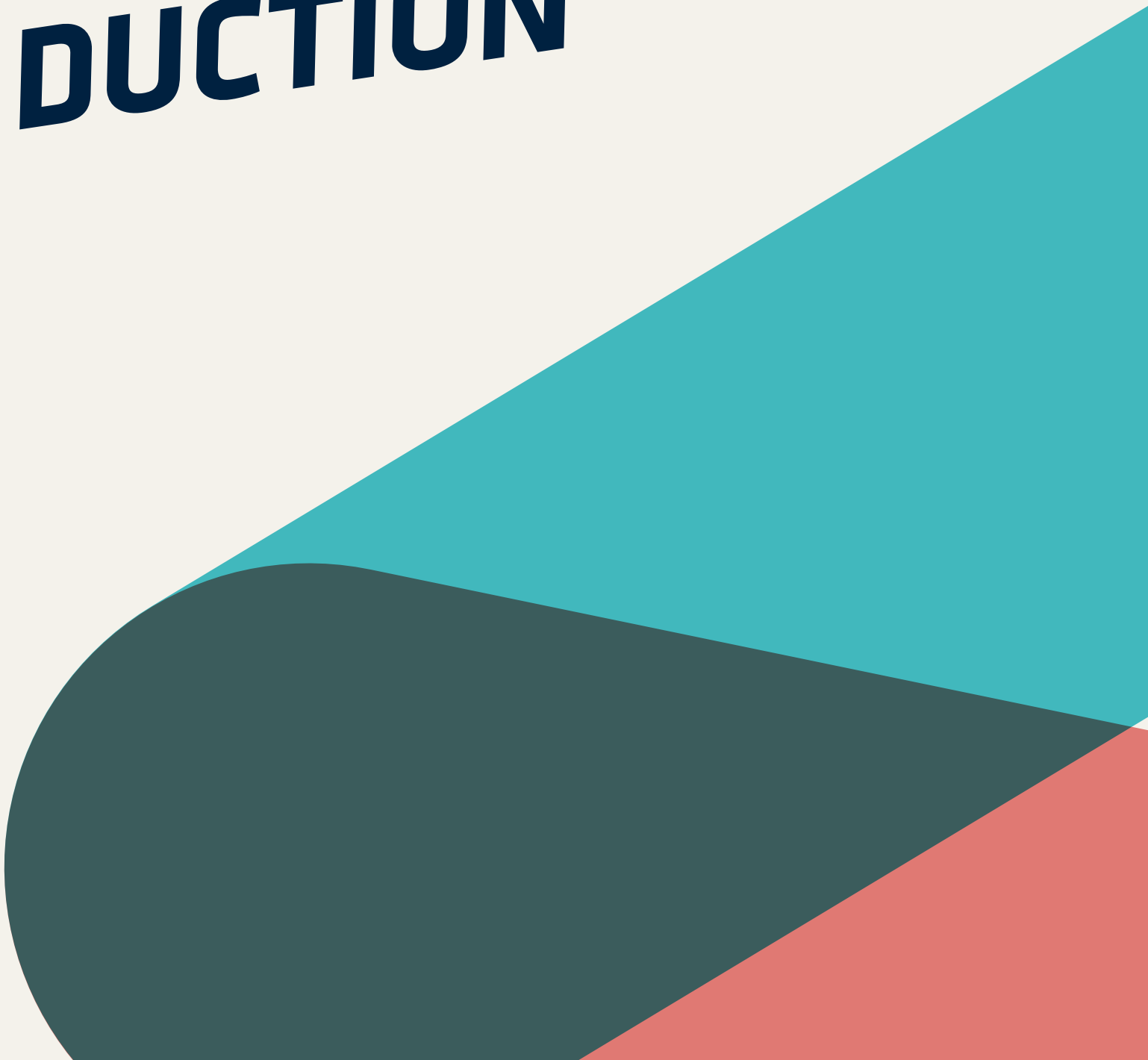
**4.7 URBAN FORM
AND CHARACTER**

5.0 NEXT STEPS

PAGE 172



1.0 INTRO- DUCTION



*“The Great University...
should look ever forward:
for it the past should
be but a preparation of
greater days to be.”*



**JOHN CURTIN,
FORMER AUSTRALIAN
PRIME MINISTER
1941 - 1945**



The Greater Curtin Master Plan has been developed by the Curtin City Project Group, consisting of AECOM, Arup, Block Branding, CBRE, Donaldson and Warn, Pracsys and Syrinx. The master plan provides a vision, supporting frameworks and design direction to guide the transformation of Curtin University's Bentley campus into a vibrant and diverse community, a 'Greater Curtin' over the next 20 years.

1.1 PROJECT CONTEXT

Greater Curtin encompasses the Bentley campus of Curtin University, an area of approximately 114ha, 6km south-east of Perth CBD. The Greater Curtin Master Plan provides spatial strategies to support Curtin University's Vision, the aspirations set by the Western Australian (WA) Government's strategic plan for Perth and Peel – Directions 2031 and Beyond. It also advances the Curtin Town Structure Plan, completed in October 2011.

Curtin University's vision is:

"To be an international leader in research and education – changing minds, changing lives and changing the world."

Its mission is its commitment to leadership, innovation and excellence in teaching and research, for the benefit of its students and the wider community. Seven objectives underpin this mission statement, namely:

- 1. Governance** – a collaborative governance structure that seeks to build research and development capacity
- 2. Knowledge, Research and Training** – facilitating partnerships with industry, business, government and researchers
- 3. Global Influence** – providing an environment to grow economic benefits for the university, state and nation

4. Innovation – a place where innovation and creativity are championed








5. Identity – an international campus with world class facilities and a culture of lifelong learning and innovation

6. City Experience – a vibrant, safe, productive and enjoyable 24/7 city

7. Student Life – a complete experience encompassing learning and living.

The master plan seeks to fully translate the objectives of both the University and the WA Government into tangible outcomes for its communities. The goal of the master plan is to set in place a vision and supporting strategies to guide the transformation of the current University from an isolated suburban campus into a major node of activity. The master plan seeks to establish a flexible framework that the University and its partners can work with, to guide the evolution of an urban centre with a strong identity, high levels of vitality, community interaction and opportunities for growth, prosperity and strong partnerships.



	Curtin University Boundary
	Education/Institutional
	Residential
	Research and Technology
	Local Centre
	Open Space
	Bentley-Curtin Specialised Activity Centre Boundary

1.2 PLANNING CONTEXT

DIRECTIONS 2031 AND BEYOND

Directions 2031 and Beyond (D2031) provides the overarching spatial planning framework for the Perth and Peel Regions. Within its Activity Centres Network, Bentley-Curtin, is recognised as a Strategic Specialised Activity Centre. Five Specialised Centres are noted in State Planning Policy 4.2 (SPP 4.2) including Bentley-Curtin, which sits outside the hierarchy of population, retail and business-based centres.

As a university-based specialised centre with a relationship to a technology park, Bentley-Curtin has great potential to expand and achieve an elevated status in the hierarchy of centres, in effect becoming a primary or strategic specialised centre.

CENTRAL METROPOLITAN PERTH SUB-REGIONAL STRATEGY

The Central Metropolitan Perth Sub-regional Strategy (CMPSS) identifies the potential of Bentley-Curtin to improve the physical relationship between the various land uses and to consolidate and diversify the centre. This strategy also recognises the University's increasing profile as a key knowledge-based employment centre and the opportunity to improve public transport connections to Canning Bridge railway station and Cannington.

In this context, the key characteristics which would define evolution into a strategically significant centre of employment are:

- Intensity and quality of employment
- Access to high quality transport
- Diversity of activities; ability to deliver and/or improve the performance of the above
- Proximity and connections to other key activity centres and catchments.

CAPITAL CITY PLANNING FRAMEWORK

The Western Australian Planning Commission (WAPC) has also produced a Capital City Planning Framework (CCPF) covering Central Perth (defined as an area measuring 12km x 12km surrounding and including the Perth CBD). The CCPF provides a spatial framework to guide future development and for the planning of Local Government areas.

The CCPF discusses the concept of a city for knowledge and culture. Perth city centre and the three university-based centres are identified as the key places in which to foster the knowledge and cultural industries within central Perth. The 'Knowledge Triangle' concept proposes that Perth city along with the specialised activity centres at Nedlands-Crawley, Bentley-Curtin and the Mt Lawley university precincts are considered as being the primary foundation for the structure of central Perth. The specialised centres form a triangular arrangement around Perth city and can facilitate the establishment of clear patterns of employment, residential accommodation and transport and build on their role of clusters of knowledge and culture through spatial proximity.

BENTLEY TECHNOLOGY PARK

Bentley Technology Park is Western Australia's premier location for technology driven and innovative organisations dedicated to information technology and telecommunications, renewable energy and clean technologies and life sciences. It is home to more than 100 organisations including technology-based industry, research and development, academia and support organisations. The park is an important catalyst for science and technology developments in Western Australia and many of the State's science and technology companies are based there.

Convenient access to innovative infrastructure; technology based R&D; and support services, creates opportunities for strategic linkages and project collaboration for Technology Park tenants within and external to the cluster.

BENTLEY-CURTIN SPECIALIST ACTIVITY CENTRE

The Bentley-Curtin Specialist Activity Centre has the potential to provide much greater support for the metropolitan planning objectives of the State Government described above. It is argued that the development of the activity centre will not just create a significant knowledge cluster, but a centre for innovation on an international scale, its two main components being Curtin University and the Bentley Technology Park.

The preparation of an Activity Centre Structure Plan is the first step in coordinating and changing the planning scale and land use mix within the centre. Advice from the Department of Planning is that a draft version of the structure plan is expected to be released for public comment in 2014 prior to final endorsement by the WAPC in the middle of the year.

This master plan will make a significant contribution to the development of the Activity Centre Structure Plan as it covers more than half of the land in the centre and includes the vast majority of the land which is capable of being developed.

It is acknowledged that the Activity Centre Structure Plan, once endorsed by the WAPC, will be the key statutory planning document which will be used to assess development applications submitted on land Reserved for Public Purposes (University) in the Metropolitan Region Scheme (MRS). The structure plan will provide guidance on the range of uses that can be approved on the Curtin campus which is covered by the MRS Scheme Reservation. This is expected to operate in a similar way to a use class table providing guidance for the approval of land uses on zoned land.



KENSINGTON

SWAN TAFE

HAROLD ROSSITER PARK

BENTLEY TECHNOLOGY PARK

EAST VICTORIA PARK

CSIRO ARRC

BENTLEY TECHNOLOGY PARK

PENRHOS COLLEGE

POLYTECHNIC WEST

COLLIER PARK GOLF COURSE

CURTIN UNIVERSITY OF TECHNOLOGY

COMO SECONDARY COLLEGE

KARAWARA

CANNING COLLEGE

REROS PARK

CSIRO AMRC

TRINITY COLLEGE PLAYING FIELDS

WATERFORD

CLONTARF ABORIGINAL COLLEGE

CENTENARY PARK

BODKIN PARK

CANNING RIVER

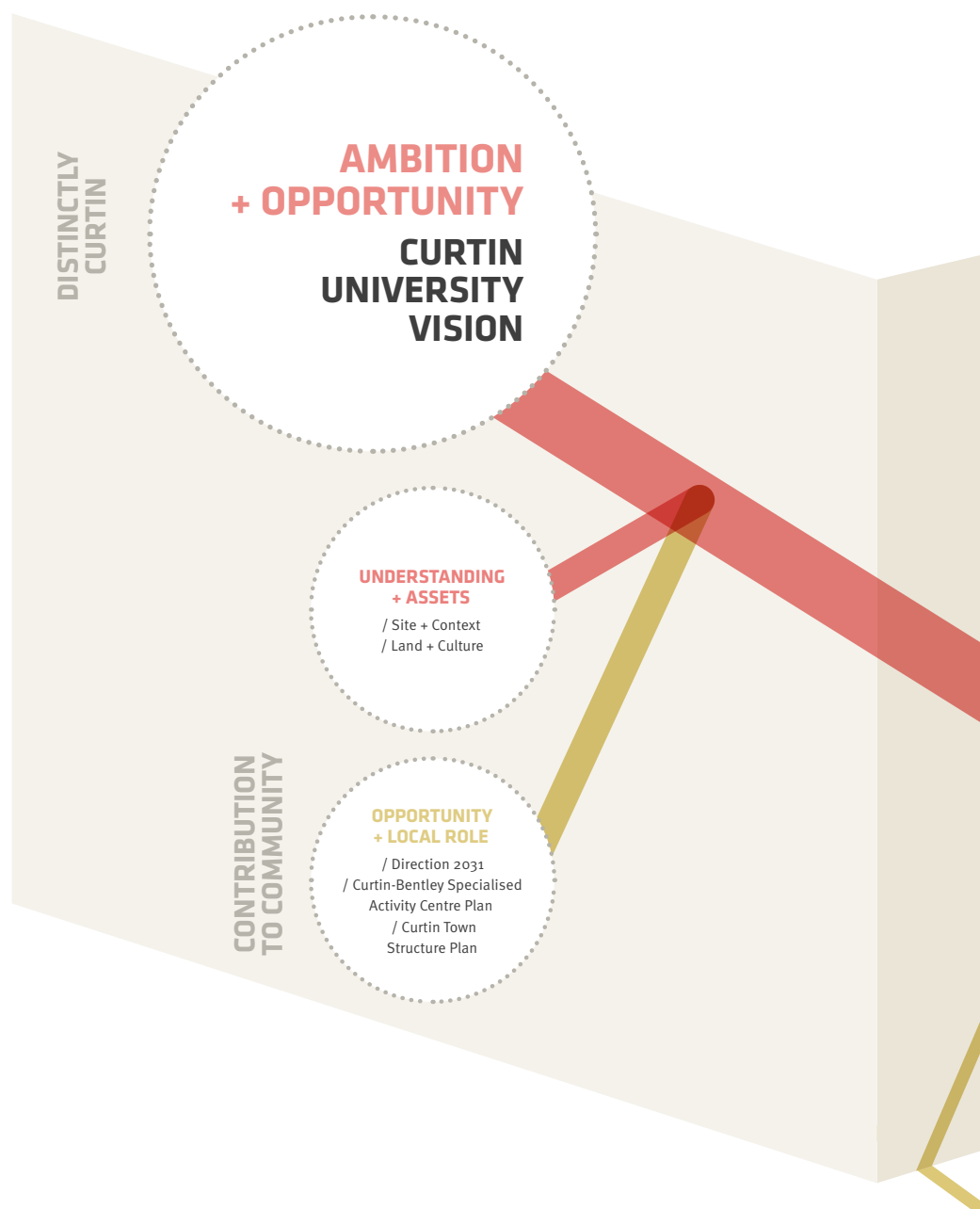


1.3 DEVELOPING THE MASTER PLAN

The master plan is grounded in, and informed by:

- A comprehensive understanding of its role and future potential contribution to the wider Perth community on a local and global stage
- A determination of the key ingredients that make it 'Distinctly Curtin'
- An appreciation of Curtin's ambition for transformative change
- An appreciation of market opportunities.

The process for developing the master plan, and engagement with and providing input to related studies are summarised in the adjacent diagram and described in the following pages.



**REGIONAL
+ INTERNATIONAL
PERSPECTIVE
+ THE CURTIN COMMUNITY**

ENGAGEMENT WITH SRP +
CSG - REVIEW + CRITICAL
DIRECTION / FEED BACK



1
Confirming
direction –
establishing the
Greater Curtin
Vision + Driving
Principles

2
Evolving the
Master Plan
– Consider +
Test 2 Design
Directions

3
Confirm
Preferred
Outline –
Develop
Master Plan
+ Supporting
strategies
(Layers)

4
Translate
Intent –
Develop
Design
Guidelines

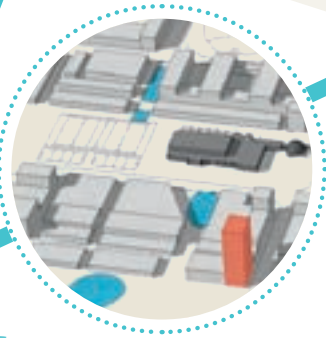
**DELIVERY +
OUTPUTS**
**GREATER
CURTIN
MASTER PLAN**



**OTHER
INFLUENCES
(INFORMING STUDIES)**

- Urban Forestry Management Plan
- Place Activation Plan
- Curtin University Biodiversity Study

**INFLUENCING
AND EVOLVING
(EARLY CATALYSTS)**



- Vision and branding strategy
- New main street
- Elite AFL training facility opportunity
- Building 410 development
- Bus interchange business case
- Existing campus alternative energy strategy

MASTER PLAN PROCESS

The Greater Curtin Master Plan was developed over a nine-month period, through the application of a five-stage process, structured to facilitate the exploration of ideas and opportunities and enable focused and effective engagement, ideas testing and iterative review:

Stage 1: Contextual analysis and baseline studies: Made sure the team established a clear appreciation of the key issues, opportunities and outcomes from previous work undertaken, as well as a thorough understanding of the areas character and distinctiveness. This comprehensive appreciation was used to inform and guide the visioning, planning and design process.

Stage 2: Accelerating and determining direction through collaborative conversations: Provided a key stage in the design development process, first reviewing the key findings from Stage 1, followed by an alignment of the project team and key stakeholders within the context of an agreed project vision and project objectives, with the determination of a number of key project parameters which were used as a point of reference for the project team and client

Stage 3: Evolving the master plan: A variety of spatial options were developed to test a variety of land use mixes and distribution outcomes and other key structural scenarios such as alignment, location and character of movement networks and public realm.

Stage 4: Delivering the master plan: Following design testing within the team and with stakeholders a refined and finalised spatial framework or master plan position was determined.

Stage 5: Production of the development framework and design guidelines: The final stage of the process involved the production of the master plan with the production of design frameworks and guidelines to provide a manual, or 'rules of engagement' document that will establish clear instruction for all involved in development across Greater Curtin.

ENGAGEMENT AND REVIEW PROCESS

Throughout the project development, the project team engaged with two key groups through a series of collaborative workshops and discussion sessions.

The Strategic Review Panel (SRP), consisting of key thought leaders from within the University and from State Government, provided valuable insight into future trends and opportunities for the project. The SRP gave consideration to regional and international influences including the physical framework required to support universities of the future.

The SRP consisted of the following members:

- Mr Charles Johnson – Board Member, Metropolitan Redevelopment Authority (MRA)
- Mr Mathew Selby – Planning Director, Government of Western Australia, Department of Planning (DoP)
- Professor Peter Newman – John Curtin Distinguished Professor, CUSP, Curtin University
- Mr Bernard Salt – Adjunct Professor Curtin Business School, Curtin University
- Professor Sambit Datta – Department of Architecture and Interior Architecture, Curtin University
- Mr Mark Woffenden – Executive Director, Resources and Chemistry
- Mr Craig Wooldridge – Director, Network Planning Moving People, Government of Western Australia, Department of Transport (DoT)
- Mr Mike Mouritz – Executive, City Futures, City of Canning
- Mr Evan Nicholas – Director, External Relations, Curtin Business School, Curtin University
- Mr Mike Burbridge – Executive Director, ASDI, Research & Development, Curtin University.

The Curtin Stakeholder Group (CSG), consisting of key academic and operational leaders within Curtin University provided valuable insight into the aspirations of the existing Curtin community and the experience of working at the university, as well as feedback on options being tested.

These sessions provided a platform for the team to continually explore and test ideas, and obtain critical feedback as the master plan progressed.

ENGAGEMENT AND INPUT INTO RELATED STUDIES

In the development of the master plan the project team engaged with a number of other project initiatives, which have provided both input and also been influenced by and developed alongside the Greater Curtin Master Plan. Of particular value was the interaction with teams developing a number of early catalyst opportunities. The engagement generated an iterative feedback loop that has both added additional layers of rigour, insight and testing of the robustness of the emerging master plan and the respective related studies:

- The Greater Curtin Vision and Branding Strategy
- The Curtin University School of Medicine development
- The Greater Curtin Main Street project
- The Greater Curtin Bus Interchange Business Case development
- The Curtin University Alternative Energy project
- Curtin University Biodiversity Study
- Elite Training Facility feasibility testing.

THE PURPOSE OF THE DOCUMENT

The Greater Curtin Master Plan is document B in a suite of three documents:

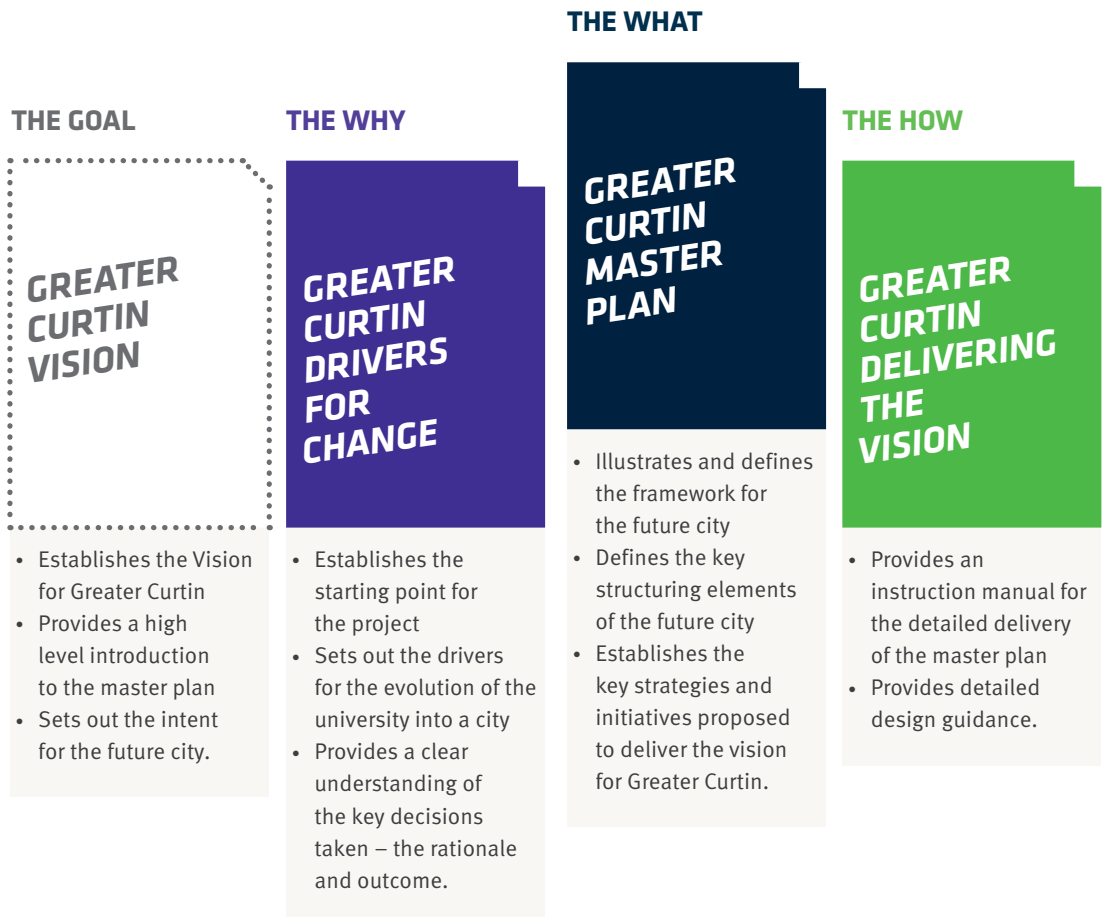
- Document A – Greater Curtin Drivers for Change
- **Document B – Greater Curtin Master Plan (this document)**
- Document C – Greater Curtin Delivering the Vision.


The role of these documents is outlined in the accompanying diagram. A Vision document supports these documents, establishing a high level introduction to Greater Curtin. A series of technical documents also exist to provide further detail behind the analysis, strategies and initiatives developed during the master plan process.

The Greater Curtin Master Plan defines the vision for Greater Curtin and provides the guiding design principles and supporting spatial layers that are the blueprint for the future city. The strategies presented in the master plan:

- Support the growth and evolution of the university for learning and research into the future
- Set in place a flexible framework to guide growth over a 20-year timeframe i.e. 2014 – 2034
- Deliver a land use strategy that seeks to maximise opportunities to create a diverse and dynamic community at Greater Curtin in partnership with government and business
- Respond to their context and seek to embed the distinctive qualities of the university’s land and cultures as key elements in the future city’s DNA

- Deliver a transit enabled environment that will support accessible and convenient access to a highly effective public and active transport network
- Deliver a high quality, attractive and efficient public realm that offers the future community access to an abundance of diverse formal and informal public open space
- Set in place strategies to guide the development and delivery of sustainable infrastructure initiatives that will support and feed the growing community and enable it to benefit from advances in technology and infrastructure systems thinking
- Facilitate engagement with industry and business partners to be part of Greater Curtin.



The background features two thick, diagonal lines: a teal line running from the top-left towards the bottom-right, and a red line running from the top-right towards the bottom-left. They intersect in the upper-middle section of the page.

2.0
DEFINING
GREATER
CURTIN'S
DNA



2.1 WORKING WITH MEMORIES AND SYSTEMS

The development of a master plan to guide the evolution of a Greater Curtin requires a deep understanding of Curtin's distinctive characteristics, an appreciation of the influences that have formed and shaped its land and cultures.

Currently, the significance and strength of the relationship between Curtin's natural systems, ecologies and cultures have been eroded or lost over several decades of development, with most of the site's natural vegetation and wetlands having been either physically cleared or in-filled.

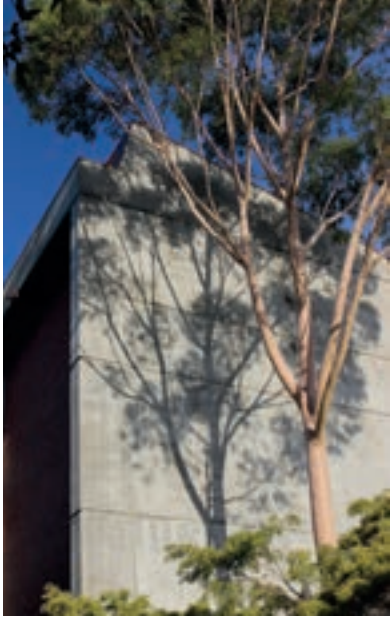
The re-evaluation and rejuvenation of the site's natural attributes will set the foundations for the evolution of the master plan. By understanding the value of these underlying systems, and by revealing and weaving them into future strategies for the land, Greater Curtin will be a place that is responsive and respectful of its land and cultures and a place that grows to support and nurture them into the future.

2.2 LAND

Key to the delivery of responsive and sustainable design outcomes for Greater Curtin is an understanding of the underlying layers of ecology, hydrology, geology and topography. Learning from these natural systems is key to exploring the opportunities to embed and express them in the future city. The respect for biodiversity and the carefully considered integration of natural systems into the master plan is a key distinguishing characteristic of the Greater Curtin place and experience.

Distant views of the city are possible from high points within the current campus





Trees are a visually distinctive element within the Curtin landscape. They provide structure and shade, and have a dynamic character that animates the natural and built form landscape as well as supporting biodiversity.










Both native and ornamental planting are features of Curtin's public realm.



Jack Finney Lake is a key natural focus within the Campus.



-  Key buildings that define the academic core
-  Historic damplands
-  Historic wetlands/depressions
-  Water bodies – existing and historic
-  Current wetlands/water bodies
-  Springs at base of slopes
-  Topography 1.5m contours

HYDROLOGY

There are several existing and in-filled wetlands towards the western edge of the site. This chain of wetlands are surface expressions of groundwater, suggesting the location of a former paleochannel (ancient drainage channel expressed through geology and soil types). Most of the wetlands in the area were in-filled for urban development and the establishment of recreational fields, and others have presumably dried up over time due to declining water tables.

CONSIDERATIONS AND OPPORTUNITIES

- The existing Jack Finney wetland and historic in-filled wetlands provide an opportunity for reinstatement
- The close proximity of the Canning River presents opportunities to extend the network of water corridors beyond the university
- The underlining hydrogeology can be used as a key driver for the development of integrated sustainable water management that will ensure protection and enhancement of water resources on site as Greater Curtin grows.

TOPOGRAPHY

The Curtin University Bentley Campus is located within the Swan Coastal Plain. The topography of the area is variable, with a high ridge along the eastern boundary, grading down to interdunal depressions to the west. The elevation on site ranges from 22.5m Australian Height Datum (AHD) in the academic core to 7.5m AHD and 10m AHD to the south near Manning Road.

CONSIDERATIONS AND OPPORTUNITIES

- The change in level presents opportunities to shape a public realm and built form experience that focuses outward, harnessing views north towards Perth CBD and south towards the river, connecting the Curtin community to its neighbours
- The presence of some undulation in the site topography presents opportunities to exploit this feature for the gravity conveyance of water/wastewater systems.

GEOLOGY

Geological mapping of the area is only available at a broad scale. Mapping of the Perth Region shows the Curtin Campus to be located entirely on Bassendean sands. Additional insight and information from nearby wetlands suggests that layers of peat are also likely to extend beneath Jack Finney Lake and other former water bodies.

CONSIDERATIONS AND OPPORTUNITIES

- Further local scale studies would determine a finer grain appreciation of the underlying geology and provide the necessary detail to support a rigorous and responsive development processes.

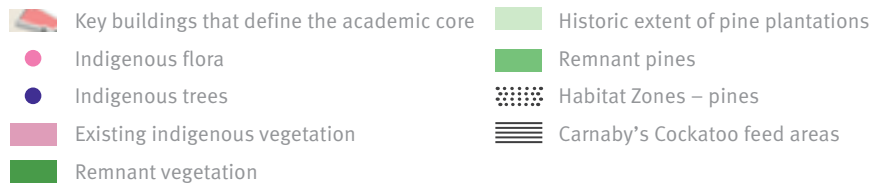




KENT STREET

HAYMAN ROAD





BIODIVERSITY

The upland area of the Curtin land was previously characterised by Jarrah/Banksia woodland, transitioning to Banksia woodland and finally wet heathland vegetation in the swales and wetlands. These rich and contrasting vegetation types would have supported a range of fauna and food sources.

The existing vegetation features a large variety of species, of varying ages, that reflect the various and ongoing characteristics of land use, habitation and history of the campus. The original remnant Swan Coastal Plain ecologies and their plant species have predominantly been lost.

Most of the site's native vegetation was cleared to establish a pine plantation during the 1930s. Pre-clearing, the historic vegetation would have been classified as Bassendean Dunes Central and South Complex. In the low lying, or moist sites, woodlands of *Melaleuca* spp. and sedgelands would have been dominant. At present, only a small, localised patch of endemic vegetation remains to the south.

Along the western and south-west boundaries the presence of flooded gum (*Eucalyptus rudis*) is indicative of the lower lying areas and riverine environment, and specimens of paperbark (*Melaleuca preissiana*) surround the stormwater detention basin. Although these have been recently planted, they reflect what would have naturally occurred around wetland depressions on Bassendean sands.

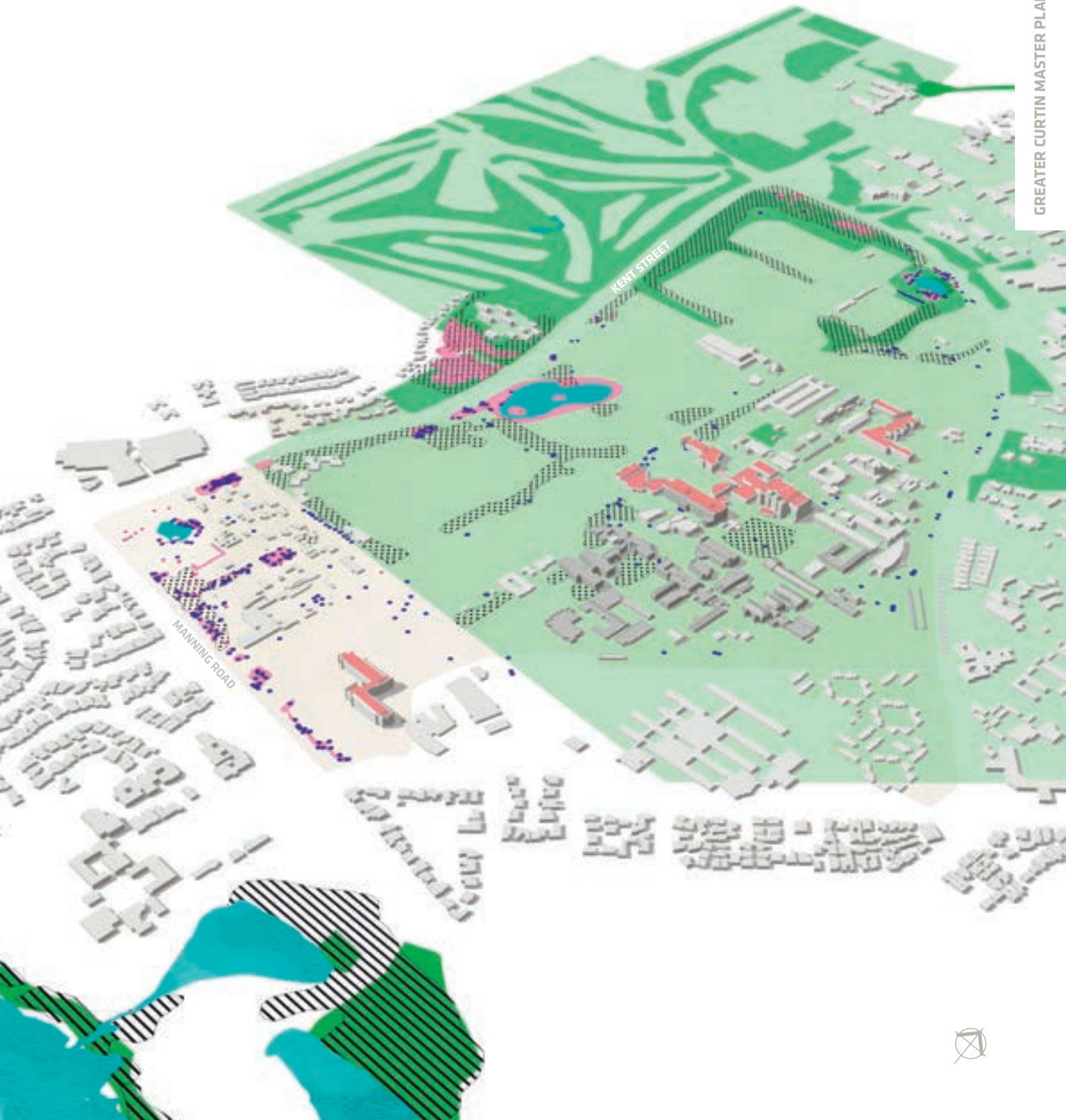
The remaining Pines, although not native, have become a distinctive characteristic of the campus, and are a reminder of the lands evolution and use. Through fire and subsequent clearing of the plantation the land was selected for the siting of Curtin University (WAIT at the time).

The pines offer a grand scale and verticality, deep colouring and are an important connection to a broader landscape, inclusive of Collier Park Golf Course and Technology Park. They contribute to the biodiversity of the area by providing 'temporary' foraging for the Carnaby's Black Cockatoo and other bird species such as the Red-tailed Black Cockatoo. Both species are listed as 'Endangered' in the *Environmental Protection & Biodiversity Conservation Act*.

CONSIDERATIONS AND OPPORTUNITIES

- Opportunity to improve the overall biodiversity of the Greater Curtin area by protecting and connecting existing indigenous trees and area of remnant vegetation, and by linking vegetation on site to that of the surrounding areas thus providing for improved habitat values (e.g. to Carnaby's Cockatoos) and amenity
- Opportunity to develop substantial regional linkages between Bush Forever sites, and improve the overall biodiversity of the area locally and regionally
- Opportunity to integrate interpretive and/or educational walking trails through the site and to the surrounding environments (e.g. the Canning River)
- Opportunity to develop a well-considered landscape response to enhance the quality of living, climate comfort and enjoyment of residents and visitors through a planned biodiversity strategy
- Opportunity to develop landscape strategies to reduce energy and water use and promote stormwater management.





2.3 CULTURES

Understanding the ways in which human habitation has shaped the land, and exploring how new cultures can continue to use the land respectfully and responsibly is essential to delivering outcomes that build a sustainable future for the area as part of the Greater Perth Region.



The distinctive architectural language of Curtin's key campus buildings provide reference points for an architectural palette for future buildings





The natural landscape at the edge of the Canning River.



The extensive areas of open space are fully utilised and support both formal and passive recreation.



INDIGENOUS

“The land which currently supports Curtin University Bentley Campus has been an important inhabited place, used for food, shelter, meetings, socialising, learning and teaching and spiritual purposes” (Simon Forest, Curtin University).

Perth’s first people are referred to as the Whadjug Nyoongar (Berndt, 1979b), which comprised four patrilineal territorial clans called the Beeloo, Mooro and Beeliar (Lyon, 1833) and Jinjinuk (Bates, 1927; Armstrong, 1837). Wetlands were valued parts of inherited land or boodja, productive campsites important for meeting needs for food, water, shelter and material needs (Hallam, 1987b). They were also places of the Serpent and areas of high aesthetic appreciation (O’Connor, 1989; Bates, 1925; 1926).

The University campus occupies a landscape associated with the Beeloo people. The water features and hilly aspect of the area are of significance to Aboriginal people and a Dreaming trail crosses the land.

The families from this area in order of longest association are the Bennels, Winmars, Garletts, Collards and Nannups.

INDIGENOUS HERITAGE SITES

Eleven Aboriginal sites have been recorded and registered with the Department for Indigenous Affairs (DIA) within 2km of the project site. Seven of these registered sites are classed as archaeological sites. Jack Finney Lake occurs within Curtin and is an Aboriginal Heritage site (id 3304) (Quartermaine Consultants, 2009).

No archaeological material has been discovered within the Greater Curtin project area during the survey and archaeological investigation of Aboriginal heritage significance undertaken by Quartermaine Consultants in December 2009. This study revealed that the one registered archaeological aboriginal site within the project area is not covered by the provision of the *WA Aboriginal Heritage Act 1972* and is listed as stored data only. The study did not uncover any new archaeological sites.

The study concluded that the site has relatively low ‘Aboriginal site potential’ based on the project area and the extent of environmental disturbance (pine plantation, car parks, buildings, landscape). However, given the proximity of the project site to the river as well as the presence of the wetland ‘chain’ (near the eastern boundary of the site) it was concluded that some archaeological material may still be present in some part of the site, and that monitoring of earthworks should be undertaken in case new archaeological material is uncovered during the site construction.

RIVER CONNECTION

The Canning River is a recognised heritage site, including the entire length of the Canning River and associated creeks, tributaries and springs. The Canning River is a site of major cultural and spiritual significance to Nyungars.

CURTIN’S RECONCILIATION PLAN

As outlined in the Reconciliation Action Plan, one of the key socio-cultural aspects of Curtin University is its commitment to Indigenous education and culture. Curtin’s vision for reconciliation is to be ‘a place of learning that respects Indigenous culture and diversity’.

As a part of this vision, the University:

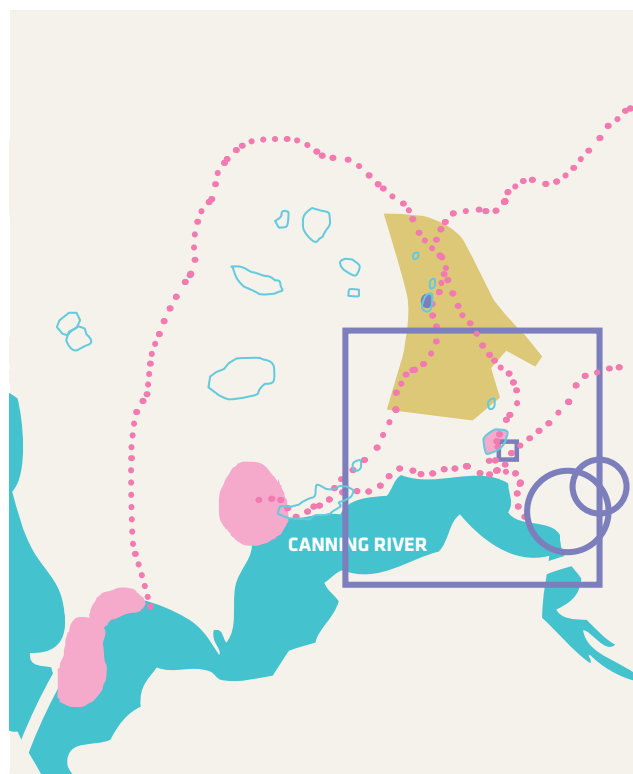
- Accepts the Indigenous connection between country, community, culture and wellbeing
- Develops a greater understanding of how our different pasts and cultures are part of our shared history and shared future
- Is dedicated to advancing reconciliation by further promoting an understanding of Indigenous culture and history
- Implements strategies to effect increased participation of Indigenous students and staff
- Continues a commitment to fostering partnerships in Indigenous research and development.




One of the key initiatives of the Action Plan is to foster ‘Respect’ by developing greater understanding of Indigenous culture including Indigenous perspectives in all Curtin undergraduate courses and postgraduate coursework awards.

- DIA Registered Aboriginal Heritage Site
- Significant aboriginal sites
- Aboriginal Dreamtime Trail and significant aboriginal sites
- Curtin Site
- Approximate Location of Pre-Development Depression/Wetlands

CONSIDERATIONS AND OPPORTUNITIES

- The opportunity to interpret and understand Indigenous values and histories should be woven into the environment and physical infrastructure of Greater Curtin
- Explore the development of strategies that deliver a tangible link between the Dreaming Trails and water management to recognise and respect the importance of water to the Indigenous community with the dolphin trail providing the potential to ‘call back’ the dolphin spirits to the area
- Explore opportunities for Greater Curtin to adopt bilingual (Nyoongar) signage
- Explore opportunities to support Curtin’s desire to be a leader in Indigenous studies in Asia:
 - Setting the agenda on future learning
 - Using natural systems such as springs, channels and wetlands as demonstrations in food ecologies
 - Mapping culturally significant plants that are of significance to the Nyoongar people (Bloodroot – painting, yam – summer food, Banksia – food and ceremonial drink, Zamia – food)
- Exploring opportunities to reinstate the wetland chain, with the restoration of Jack Finney Lake in particular considered a cultural priority. This would tie in with the Curtin University Reconciliation Plan and the objectives of the University, which seek to respect and honour traditional values.



-  Key buildings that define the academic core
-  Dolphin Dreaming Trail
-  Department of Indigenous Affairs (DIA)
Registered Aboriginal Heritage Site

DOLPHIN DREAMING (KURU KURU) TRAIL

“An important dreaming trail crosses the land, running from Salter Point to Clontarf. Salter Point is the place of Three Dolphins Dreaming, and also the training ground (river) for young dolphins. Historically, this area is where the women used to meet, although men and boys were welcome. This was a healing and storytelling place largely vegetated with zamia palms, which have now mostly disappeared. The zamia nuts were used as bush medicine. Ceremonies took place in Djugeron season (April/May) where the Aboriginal people feasted on zamia nuts and mullet from the river (loaves and fishes). A ceremony was held there as recently as 2010. There are three wetlands still existing, the fourth is now occupied by tennis courts.

Further south, and to the left of Salter Point, is a wetland that runs along the river which has been interrupted and modified in places with residential properties. This area is called by the Aboriginal people, Frog Dreaming. It is home to the Barking Owl, Nankeen Heron, Blue Faced Heron, frogs and freshwater turtles. The Bodkin Park Reserve is part of this area.

The Twin Dolphin Dreaming site is east of Clontarf, where environmental restoration work is almost finished. This site has two wetland areas, in the shape of dolphins facing each other. One is particularly healthy with spring fed running water and many species of birds and ducks. It has been suggested Gilgies would exist here, and these have been used as a measure of water purity with Gilgies only thriving in pure conditions. The next indicators are the frogs, also in abundance.




The other area containing pure sweet water is located in the bushland below Aquinas College, also marked by clean white sand which indicates a spring. This area is not to be touched but if there is disturbance ‘it will take care of itself with consequences that project planners would not expect.

This ends the ridge to the north of Curtin Uni. A Dental Clinic has been built on this ridge towards Como. This ridge has special significance and forms part of the dream trail that encircles Greater Curtin. The Dreaming Trail passes through the middle of Curtin University, through the buildings on the northern side along the ridge and through the sports fields (former wetlands) to the west.”

The above dialogue regarding the dreaming trail was shared by Noel Nannup and Violet Newman with the project team on 9th August 2012.





-  Key buildings that define the academic core
-  Academic Core
-  Planning Module

ACADEMIC CORE

Various sites were considered for the Western Australian Institute of Technology (WAIT), with locations in the city deemed unsuitable due to the limited space. The institute finally found a home in 1962 following a fire, which cleared a large section of the Collier Pine Plantation in Bentley, 6km south of Perth.

The core infrastructure was built over the next four years and WAIT officially opened on 17 August 1966: The first students enrolling the following year.

The core campus and sports fields were carved out of the regular grid of the pine plantation, leaving remnant stands and buffer landscapes defining the campus perimeter. Vin Davies, a Public Works Department architect, was chosen to design the initial buildings. Davies signature style, using bricks and off-form concrete set the tone for future building designs and is a core architectural language of the contemporary campus.




The distinctive visual and physical qualities of these key landscape and built form elements are important cultural references for the University.

CONSIDERATIONS AND OPPORTUNITIES

- Define a new textural and distinctive architectural palette for future development that draws on the architectural language of the core university buildings
- Utilise and extend the early organisational grid of the university's historic core as part of a rational structuring framework for future development
- Utilise the distinctive visual character and ecological and amenity value, of the pines as a key ingredient in the future landscape strategy.





-  Key buildings that define the academic core
-  Recreational
-  Sporting fields

SPORT AND RECREATION

Existing sport and recreational facilities at the University primarily cater for student activity during semester, resulting in a winter sport dominated programme. While a select number of sporting and community groups, as well as the successful Australian Institute of Sport (AIS) and Australian Hockey programme are based at Curtin, the University currently prioritises the needs of its students above external elite athletic groups and the general public.

The sporting fields are well used, however few are of a high quality standard, and all existing social/clubroom facilities are in need of upgrade. Barblett Oval is without facilities or lighting and consequently is not used as frequently as other fields. Despite this the field regularly attracts and accommodates seasonal sporting competitions. With its direct road access and adjoining parking the oval is a much desired amenity with the increased flexibility of any other field due to its considerable size.

With direct access to stadium facilities, suitable lighting amenities and good management, Edinburgh Oval is the primary playing and training field on campus. With the highest utilisation figures, it illustrates the importance of north-south field orientation, good event management and how amenities increases demand.

Edinburgh Oval South is dedicated to informal recreation. It is freely available and as a result increasingly used by the surrounding community. It is also occasionally used for activities such as graduations and Open Days. Edinburgh Oval South has become an iconic image of Curtin University.

South Oval, at the southern end of the campus, is the largest open space area and the only dedicated oval field on campus. Surrounded by student housing the space is informally well-utilised during semester by the neighbouring students and through the summer months by an external Australian rules football team. Although the fields themselves aren't dual purpose, the overall annual use endorses the beneficial nature of close proximity to residential dwellings, especially student accommodation.

The master plan will need to consolidate and rationalise fields in order to develop the right balance and diversity between the recreational needs of the university and the future needs of the city.

CONSIDERATIONS AND OPPORTUNITIES

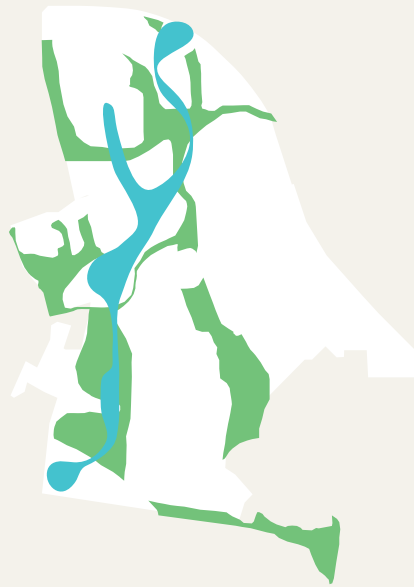
- Enhance the quality of sports fields, pitches and associated facilities:
 - Improved pitch quality
 - Improved ancillary facilities, e.g. lighting, club house and change room facilities
- Explore opportunities to rationalise and maximise the efficiency and flexibility of facilities:
 - Support diversification of sporting provision
 - Flexible field/pitch sizes to accommodate multiple sporting codes throughout both summer and winter seasons
 - Appropriate ancillary facilities to support broader use of facilities, e.g. lighting to enable night use
- Enable connectivity between university practice and research
- Enhance partnerships with a broader range of elite and community sporting organisations.



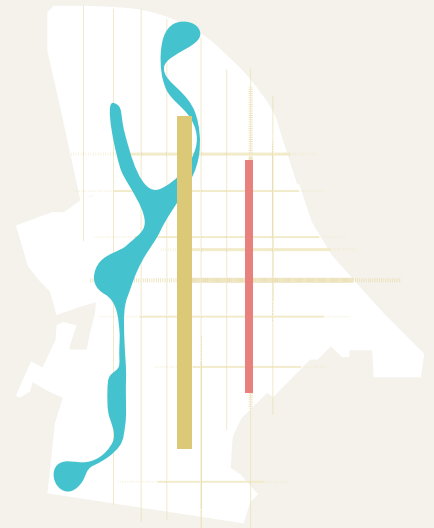


2.4 STRUCTURING ELEMENTS

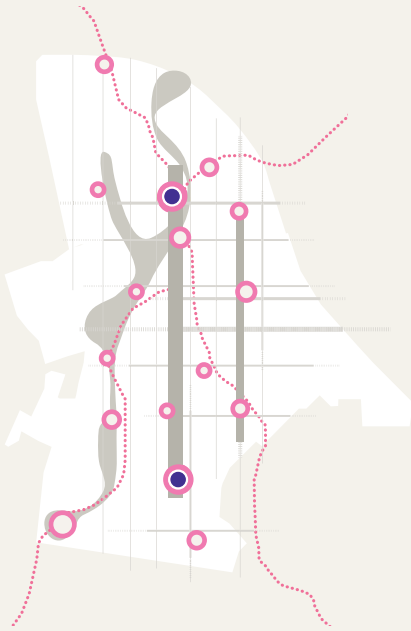
The structuring elements provide the key building blocks for the master plan at a comprehensive and site-wide scale. They set in place the fundamental structures and systems within which finer grain detail of design and development opportunity will be shaped:



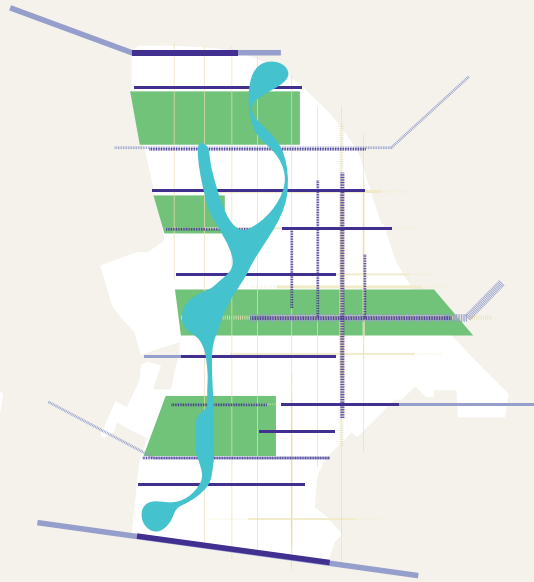
SYSTEMS



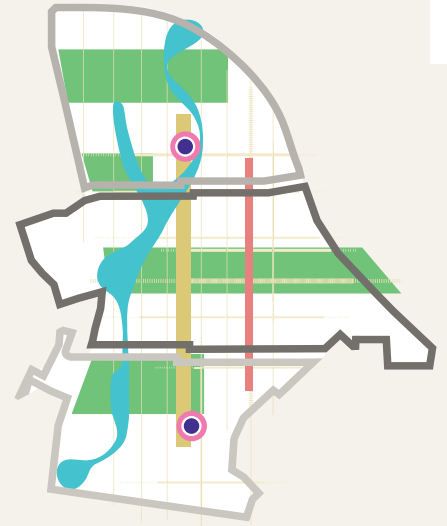
STRUCTURES









NODES



NETWORKS



NEIGHBOURHOODS

-  Key buildings that define the academic core
-  Existing buildings
-  Greater Curtin
-  Canning River
-  Biodiversity corridors
-  Living Stream

SYSTEMS

Two key elements for the master plan are drawn from the legacy and characteristics of the area's natural landscape. The plan develops strategies that respond to, protect and augment both the hydrological and ecological systems of the land, embedding natural processes and a focus for ecological innovation as structuring corridors.

INITIATIVES








- Platforms for sustainable infrastructure
- Living Stream – The focus of the Living Stream is on aquatic and ecological initiatives, including water management, water play and 'biophilic design'. Within this corridor the emphasis is on encountering buildings and places that connect people and nature, an environment that reflects a love of life or living systems and the creation of healthy and productive habitats for a contemporary community
- Biodiversity Corridors – Promoting and supporting improved ecological conditions and ecological networks. Greater Curtin will enable the creation of diverse habitats

that support a wide range of plants and animals. The strategy will strengthen regional linkages between Bush Forever sites and improve the overall biodiversity of the area locally and regionally, extending a network of corridors across and beyond Greater Curtin. Green roofs will play an important role in contributing to the connectivity of the biodiversity corridors

- These corridors provide a focus for education and interpretation of both natural systems and technological innovations in infrastructure delivery
- The connectivity and continuity of the public realm created within the corridors will provide highly accessible and quality amenity for the enjoyment of all
- The design of these continuous spaces will deliver greater climate comfort for residents and workers and will help manage heat island issues associated with urbanised environments.





-  Key buildings that define the academic core
-  Existing buildings
-  Greater Curtin
-  Canning River
-  Main Street
-  East-west links
-  Corso

STRUCTURES

The Master Plan delivers a development framework that extends a rational grid from the university's historic core, providing an efficient structure that both defines development parcels to accommodate growth, and extends corridors of connectivity through Greater Curtin and into the adjacent neighbourhoods.

Within this structure are three key north-south aligned corridors. These lines provide focuses that connect the community and focus the key areas of community activity and investment intensity.

INITIATIVES

- The definition of well-defined 'Superlots' that enable effective and efficient development delivery parcels to be determined and infrastructure planning to be integrated
- Living Stream – The 'Living Stream' defines the western most aligned corridor and is a focus for innovation and design responses that connect people and nature, it is an environment that supports the creation of healthy and productive habitats for a contemporary community to be part of and enjoy and supports innovation in the delivery of sustainable infrastructure
- Main Street – Is the central structuring spine of Greater Curtin and the primary urban street. It is the focus for arrival and interchange within Greater Curtin and supports a variety of activities to achieve the desired urban vibrancy. It is characterised by four distinct experiences:
 - Defines the two key thresholds or the points of arrival to Greater Curtin
 - Is a focus for the two vibrant centres focused around transit hubs
 - Is a focus for linear activation, with built form maintaining a positive visual and physical relationship with the street
 - Provides a point of interface with the Central Green
- The Corso – The Corso is the eastern most aligned corridor. The Corso extends a continuous pedestrian link through the heart of the University campus core and is a 'linear meeting place' linking key destinations.















KENT STREET

HAYMAN ROAD



-  Key buildings that define the academic core
-  Existing buildings
-  Greater Curtin
-  Canning River
-  Main Street
-  East-west links
-  Corso
-  Dreaming trails
-  Nodes of arrival and activity
-  Nodes of cultural and ecological expression

NODES

The master plan sets up the opportunity to celebrate and physically express key locations where features of the natural landscape intersect and connect with important cultural and community references and experiences; where the memories and systems intersect.

A strategy is proposed that defines cultural nodes or points of ignition. These are places of intensity and focus for initiatives that express culture, the past, the present and the future, the natural systems and innovations in technology, and research and practice. They provide focal points within the plan where deliberate opportunities for the community to meet, to exchange ideas, have fun, learn and relax should be developed.

INITIATIVES

- The master plan determines a number of key locations where the opportunity to celebrate cultural diversity and technological innovation in the design of buildings and public realm should be optimised.













KENT STREET

HAYMAN ROAD



-  Key buildings that define the academic core
-  Existing buildings
-  Greater Curtin
-  Canning River
-  Primary movement corridors
-  Key active transport corridors
-  The Greens
-  Key east-west links

NETWORKS

Harnessing the opportunities presented through greater connectivity is a key objective of the master plan. The definition of a strategically considered network of public spaces and streets establishes the framework for the delivery of:










- A transit enabled movement network that reinforces the lines defined by the rational urban structure and delivers an efficient movement network
- A network that offers easy and accessible connections within Greater Curtin and to the community beyond
- A network that prioritises interchange and movement between people and public transport over cars, supporting a seamless multi-modal service with all forms of movement accommodated
- Vehicle speed management through design and encouragement of shared use of streets rather than segregation (except along some key transit enabled links)
- An integrated public realm that can be utilised to support safe and comfortable forms of active transport as well as providing general amenity and places of open collaboration for the Greater Curtin Community.

INITIATIVES

- The structure consolidates future development potential within concentrated east west bands to focus the critical mass of activity and energy and optimise the value, efficiency and return from expenditure on infrastructure such as streets
- The strong hierarchy of the physical network delivers the optimal outcomes for wayfinding and legibility
- A comprehensive approach to the use and location of corridors optimises opportunity to establish both physical and spatial networks.





-  Key buildings that define the academic core
-  Existing buildings
-  Greater Curtin
-  Canning River
-  Defined Neighbourhoods
-  Main Street
-  Corso
-  Living Stream
-  Nodes of arrival and activity

NEIGHBOURHOODS

Greater Curtin consists of three distinct neighbourhoods. Defining the neighbourhoods and using these geographically defined contexts helps provide greater legibility and definition of character for the Greater Curtin Community, helping to define the opportunity for distinctive approaches towards built form, public realm, streets and land use mix.

INITIATIVES

- The proposed structure provides a framework to accommodate the activity of existing planning and development direction, concentrating energy in key areas and accommodating a range of scales and development types
- Activity within the neighbourhoods seeks to achieve the following objectives:
 - The accommodation of land uses that deliver the University’s vision and mission, as well as responding to market drivers and site opportunities and constraints
 - Inform the development of building massing and an urban structure that promotes efficient use of land, responds to climate, and creates distinctive character
 - Deliver land uses, yield and GFA aligned with market needs and delivery of the University’s vision to diversify land use mix and the character of the Greater Curtin community.





3.0

**BRINGING
INNOVATION
TO LIFE**

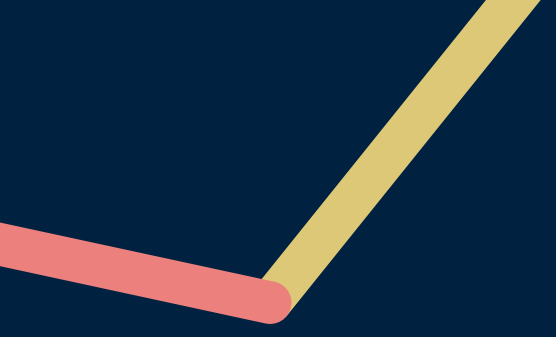


3.1 VISION

The Greater Curtin Master Plan represents the physical translation and application of a Vision and a set of six guiding Design and Planning principles. The Vision for Greater Curtin is established on the following page.

Greater Curtin will be a city supporting innovation, collaboration and creativity. It will be home to a diverse and integrated community.

Greater Curtin will provide a boundless and adaptable urban context that supports constant exchange between industries, businesses, governments and researchers, forging partnerships in a place where new thoughts can be conceived and where knowledge and innovation extend beyond buildings.



Its communities will be seamlessly connected with the ability to meet, share and learn together. Whether in a lab, a cafeteria or underneath a tree, it will be a place that encourages thinking, thriving on togetherness, a prosperous city of diverse cultures whose goals are one and the same.

To make tomorrow better.



3.2 PRINCIPLES

A set of six overarching design and planning principles have been defined. These principles provide a reference point, and foundations to ensure each new project opportunity and initiative builds towards delivering the Greater Curtin Master Plan vision. Consideration for each and all of these principles in design and development discussions, and in decisions that will shape or influence the character of the area is critical.



GREATER SYSTEMS

The master plan for Greater Curtin embeds a progressive strategy to achieve sustainable development outcomes. Feeding and supporting the future city is a network of integrated infrastructure systems designed to anticipate the growth of the future city, supported by strategies that enable adaptation to accommodate innovation in services provision.



LIVING LABORATORY

The evolution of the city, its design, construction and life will provide a focus for education and life-long learning, leveraging off academic and research opportunities, and providing platforms for collaboration, innovation and the exchange of knowledge. The evolution and delivery of the master plan will provide opportunities for and be inclusive and draw on the knowledge and experience of its resident communities.



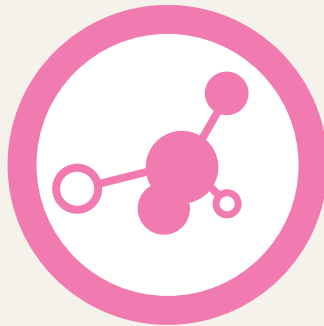
COLLECTION OF CULTURES

Greater Curtin will be home to a diverse and integrated community. It will be a vibrant place characterised by intimate, local, human scale neighbourhoods with easy access to everyday needs. It will be an environment that enables its residents to live, work and play in Greater Curtin.



PLATFORMS FOR PARTNERSHIPS

The approach to architecture and urban planning is embedded in this concept, promoting the delivery of spaces that facilitate knowledge networks, establishing an attitude to architecture of open plans and the provision of spaces for interaction and community, enabling the evolution of a city that thrives on collaboration, diversity and innovation.



NETWORKED COMMUNITIES

Embedded within the Greater Curtin structure is an integrated urban movement network that provides access to convenient and attractive public transport with transit enabled streets that are safe, walkable and cycleable. This network will extend strong links beyond the city, effectively connecting the Greater Curtin community to its neighbourhood, to Perth and into the region.



DISTINCTLY CURTIN

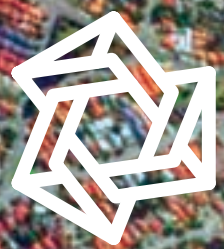
Greater Curtin will grow from established foundations. The distinctive characteristics of its land and cultures provide the building blocks for the future city, establishing the framework for the evolution of a place that is responsive and respectful of its heritage, looking forever forward from its past.



3.3 GREATER CURTIN: TRANSLATING THE VISION

- 1 Greater Curtin
- 2 Future light rail to Perth CBD
- 3 Perth CBD
- 4 Swan River
- 5 Future light rail to Canning Bridge
- 6 Future light rail to Cannington
- 7 Canning River





GREATER
CURTIN

THE ILLUSTRATIVE MASTER PLAN

An illustrative plan has been produced to visually explore and communicate the full potential of what can be delivered, through the application of the plans and strategies which define the physical translation of the Greater Curtin vision.

It provides an indicative view of the structure of the built form, infrastructure and landscape character that will result from the application of the master plan design direction and planning principles, and in particular it seeks to demonstrate the place making and experiential outcomes that are sought.

- 1 Gateway development
- 2 Urban student residential
- 3 The Greens
- 4 Perth Hockey Stadium – elite hockey hub
- 5 Light rail alignment
- 6 Hayman Road light rail stop
- 7 Northern light rail stop, bus interchange and retail hub
- 8 Health research and practice
- 9 Indoor Sport and recreation centre
- 10 Urban plaza and Curtin Dome
- 11 Living Stream providing stormwater management and urban amenity
- 12 Main Street urban boulevard
- 13 Corso
- 14 Jack Finney Lake
- 15 Central Park
- 16 Mixed Residential
- 17 Facilities management hub
- 18 Academic core
- 19 Dolphin dreaming trail
- 20 Southern light rail stop, urban plaza and retail hub
- 21 Existing trees
- 22 New arts hub – education and community
- 23 Improved connectivity to Canning College
- 24 Research Laboratories
- 25 Light rail stabling facility



BENTLEY
TECHNOLOGY
PARK

POLYTECHNIC
WEST TAFE

HAYMAN ROAD

KENT STREET

MANNING ROAD

WATERFORD
PLAZA

CANNING
COLLEGE

NEIGHBOURHOODS

Greater Curtin is defined by three distinct neighbourhoods. These are described below.



Greater Curtin North is the pulsing heart of the Greater Curtin community. It is a major point of arrival and fusion of diverse activities.

Activity

- A multi-modal transport interchange, supporting connectivity to and within Greater Curtin
- Greater Curtin's largest and most diverse neighbourhood offering the day-to-day needs of a thriving community
- A large 'green' provides a focus for formal recreation, supporting both elite and club sports
- With a strong focus on health and wellbeing, forging strong synergies between research and education
- A place of diverse residential opportunities, with homes for students, researchers and professionals.

Key Features

- The historic geodesic dome is given prominence at the heart of the neighbourhood, anchoring Main Street and delivering distinctiveness
- New health buildings provide an innovative prestigious home for tertiary medical education
- An upgraded Perth Hockey Stadium provides a focus for elite sport
- Club and community sport is enhanced through the expansion of Curtin Stadium and establishment of high quality, flexible pitches for soccer, rugby league, hockey and cricket, replacing the Barblett and Edinburgh Ovals.

Greater Curtin Central is the ceremonial and civic heart of Greater Curtin. It is a major focus for civic, cultural and leisure activities.

Activity

- A range of civic and community venues provide places for art, culture and ceremonial activities
- A strong focus for teaching and learning, it blurs the line between Greater Curtin and the traditional 'academic core'
- At its heart is a 'Central Park', providing event space and informal opportunities to enjoy the outdoors
- A key address for business along Main Street
- Providing a concentration of student accommodation at the heart of the university.

Key Features

- The revitalised Edinburgh Oval South provides green amenity for residents and visitors, including a restored Jack Finney Lake, an open expression of the Living Stream
- A new ceremonial drive provides a formal entrance into Greater Curtin for important events
- A high-quality hotel and conference centre provides a home for functions and events.

Greater Curtin South is an innovation powerhouse, supporting networks of research and business activity.

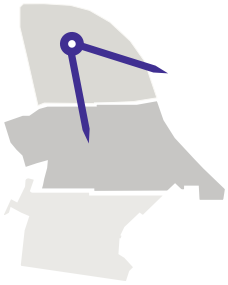
Activity

- A southern transport interchange, supporting connectivity to and within Greater Curtin
- A hub of thriving business activity and research and commercial partnerships
- A large 'green' provides a focus for formal recreation, supporting elite and other club sports
- A focus for the resources and chemistry industries
- A pleasant and convenient home for students, professionals and academics.

Key Features

- Australia's oldest mining school is supported in a hub of research facilities and commercial partners
- An urban plaza provides a focus for day-to-day life and provides access to public transport
- A new Humanities/Arts Faculty provides a cultural focus, and interactive platform for the participation of all
- A strong network of green, enhances biodiversity and increases opportunities for interactions between nature and the community
- Integrates a transit stabling facility with facilities to showcase and support cutting-edge infrastructure initiatives and research.





NORTHERN GATEWAY

The Greater Curtin northern gateway brings visitors and residents into the heart of the City via a tree lined avenue that runs beside one of three public 'Greens'.

The deliberate arrangement and relationship between built form and space strongly defines the edges of the 'Green', holding the space and establishing strong relationships between the community and the landscape.

The adjacent building forms and their massing establish a clear address and entry for Main Street from the north.

In the adjacent illustration the northern most section of Main Street is illustrated, book ended by development that holds and defines the corners of the street and delivers a strong sense of arrival into the heart of Greater Curtin.



GREATER
SYSTEMS
LIVING
LABORATORY
COLLECTION
OF CULTURES
PLATFORMS FOR
PARTNERSHIPS
NETWORKED
COMMUNITIES
DISTINCTLY
CURTIN



**BOUNDLESS AND
ADAPTABLE SPACES**



**GREEN
INFRASTRUCTURE**



**WI-FI
EVERYWHERE**



**COMFORTABLE PLACES
FOR EVERYONE**



**SPACES FOR
ENTREPRENEURS**



**DREAMING TRAILS
INTERPRETED**



**RESEARCHING
NATURAL SYSTEMS**



**INTEGRATED
BIODIVERSITY**



LIVING STREAM

The Living Stream is a focus for Biophilic design and a place of community interaction and learning. The Living Stream will be a key feature of the Greater Curtin landscape, providing a focus for the public realm and community, running through the heart of the development and connecting the neighbourhoods.

Adjacent buildings engage strongly with the space both in terms of materiality and also physical interface. The anticipated land use adjacent to the Living Stream includes a focus on community facilities.

A nursery or community hall could occupy a building, spilling out and activating the adjacent public realm. At the heart of the space 'The Living Stream' is a focus for both ecological and cultural education, bringing the stories of the land and Indigenous culture alive, through interpretation and art, and giving them relevance and presence in the contemporary city.



MAIN STREET, NORTHERN SQUARE AND TRANSPORT INTERCHANGE

The Northern Square will be the primary hub of the new City and the key point of arrival and interchange in the northern neighbourhood. The design of its facilities and amenities evolve around ideas promoting opportunities for exchange. In the foreground of the adjacent illustration is the Main Street and its Urban Square.

This section of Main Street is tightly defined by built edges of more significant scale, with activation at the ground floor level, where the inclusion of colonnades or awnings deliver climate comfort to promote a pedestrian focused environment.

The area will be a key commercial hub within Greater Curtin and a place where the community come to get day-to-day needs as well as meet and play into the evening.

The area is also the principal public transport hub within Greater Curtin, featuring a light rail stop and bus interchange.





GREATER SYSTEMS
LIVING LABORATORY
COLLECTION OF CULTURES
PLATFORMS FOR PARTNERSHIPS
NETWORKED COMMUNITIES
DISTINCTLY CURTIN

 EXCHANGING IDEAS

 PEOPLE AND BIKE FRIENDLY

 INTEGRATED TRANSPORT



**BUILDING
SUSTAINABILITY**



**ECOLOGICAL
PARKLANDS**

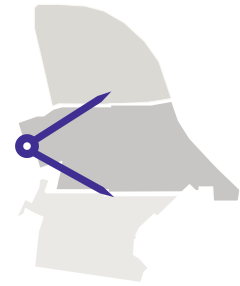


**CONNECTING PEOPLE
WITH NATURE**



 A CULTURAL HUB

 CREATING A SMARTER COMMUNITY



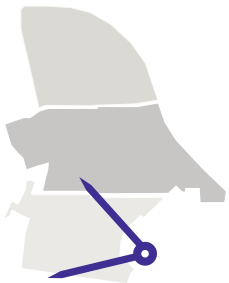
CENTRAL PARK AND JACK FINNEY LAKE

At the heart of Greater Curtin, Central Park is a key resource and focus for ceremonial activities and community leisure. It provides a platform for people to meet, relax and play.

A distinctive focus of the space is Jack Finney Lake, which represents the most significant expression of the Living Stream as a watercourse, and key asset within a natural landscape setting.

In the adjacent illustration the existing University core provides a backdrop to the park, rising up the hill, with Main Street passing through the park. The parkland is edged by development, which activates the park perimeter as well as key east-west pedestrian and cycling routes providing safety and climate comfort.

Central Park is a well-designed natural landscape, a focus of community activity, with both informal recreation and leisure supported, and focus for community celebrations on an urban green defined by culturally significant activities that activate its edges.



SOUTHERN SQUARE AND TRANSPORT INTERCHANGE

The Southern Square is a key gateway into Greater Curtin. The square celebrates the synergies created between research and industry through its formal and dynamic character. The space is defined by strong built form that accommodates offices and institutional activity with cafes, lunch bars and alfresco eating at street level.

A distinctive commercial tower provides a visual marker that announces the neighbourhood. The contemporary character of the arts faculty buildings provide a dynamic juxtaposition to the formal nature of these adjacent buildings.

The adjacent view illustrates the urban square, linking the southern extent of Main Street. The building and public realm design reflects a focus on transparency of learning within the buildings and on the street – the significant characteristic of this neighbourhood is the clear opportunity of partnerships between business and academia being formed inside and outside.



**LIGHT RAIL
CONNECTS**

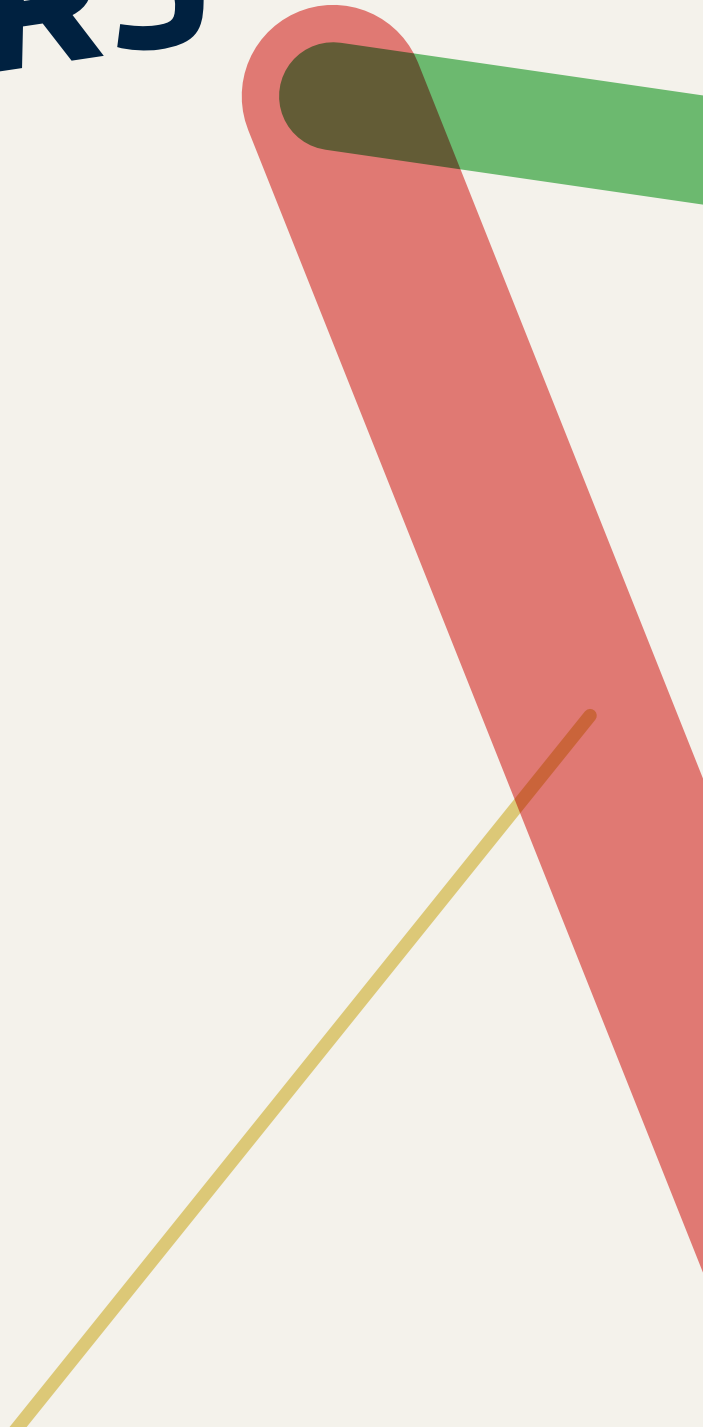


**A COLLABORATIVE
LAB**

GREATER
SYSTEMS
LIVING
LABORATORY
COLLECTION
OF CULTURES
PLATFORMS FOR
PARTNERSHIPS
NETWORKED
COMMUNITIES
DISTINCTLY
CURTIN



4.0 UNDERSTANDING THE LAYERS



4.1 INTRODUCTION

The following section describes the layers that together comprise the Master Plan. Each layer proposes a series of instructions, initiatives and strategies to realise the Vision for Greater Curtin. These layers include:

- **Activity and Delivery** – exploring land use activities and development staging
- **Movement** – exploring street structure and hierarchy, public transport networks and infrastructure, pedestrian and cycle networks, and parking strategies
- **Future Systems** – exploring sustainable energy infrastructure including electricity, gas and heating/cooling, and integrated and sustainable water management
- **Public Realm** – exploring guiding principles, structuring elements, key areas and key places
- **Built Form** – exploring development bands, super blocks, built form character and principles, and urban profile.

4.2 ACTIVITY AND DELIVERY

The Greater Curtin Master Plan presents a carefully considered land use strategy that:

- Creates hubs of concentrated activity around transport nodes
- Focuses on the activation of key streets
- Facilitates synergies between business and academia
- Provides a strong civic and community focus
- Frames key public open spaces
- Delivers a range of appropriate residential opportunities to support academic and commercial activities.

The following pages explore the land use mixes as distributed across the site and the proposed sequencing for the delivery of development.



**100% OF RESIDENTS
AND WORKERS
WITHIN 5 MINUTE
WALK TO RETAIL
SERVICES**



PERTH
3.5 MILLION
BY 2031



73,000
DAILY
VISITORS



**93% OF RESIDENTS
AND WORKERS**
WITHIN 5 MINUTE
WALK TO PUBLIC
TRANSPORT



20,000
MIXED
RESIDENTS



23,000
WORKERS

	Land Use Activity	GFA (m ²)
	AC. Academic	142,032
*GF	CO. Community Space	52,173
	RA. Residential Apartment	147,884
	RC. Residential Academic	143,687
	RE. Retail (ground floor only)	58,065
	RH. Residential Hotel	19,890
	RO. Residential Short Stay	4,131
	RS. Residential Students	29,201
	RT. Residential Townhouse	19,730
	OF. Office/Commercial	329,544
	TC. Transport Car Park	125,308
	TI. Transit Interchange	10,223
	TS. Transit Stabling	20,700
	TOTAL	1,102,568

* Denotes Ground Floor land use for certain community use buildings

ACTIVITY

The identification of land for different development markets and the careful consideration of land use mix and adjacencies in each development lot is a key strategy of the master plan to guide outcomes that will increase diversity and opportunities to forge partnerships and realise urbanisation economies. The proposed land uses and corresponding gross floor area are identified in the adjacent plan and table.

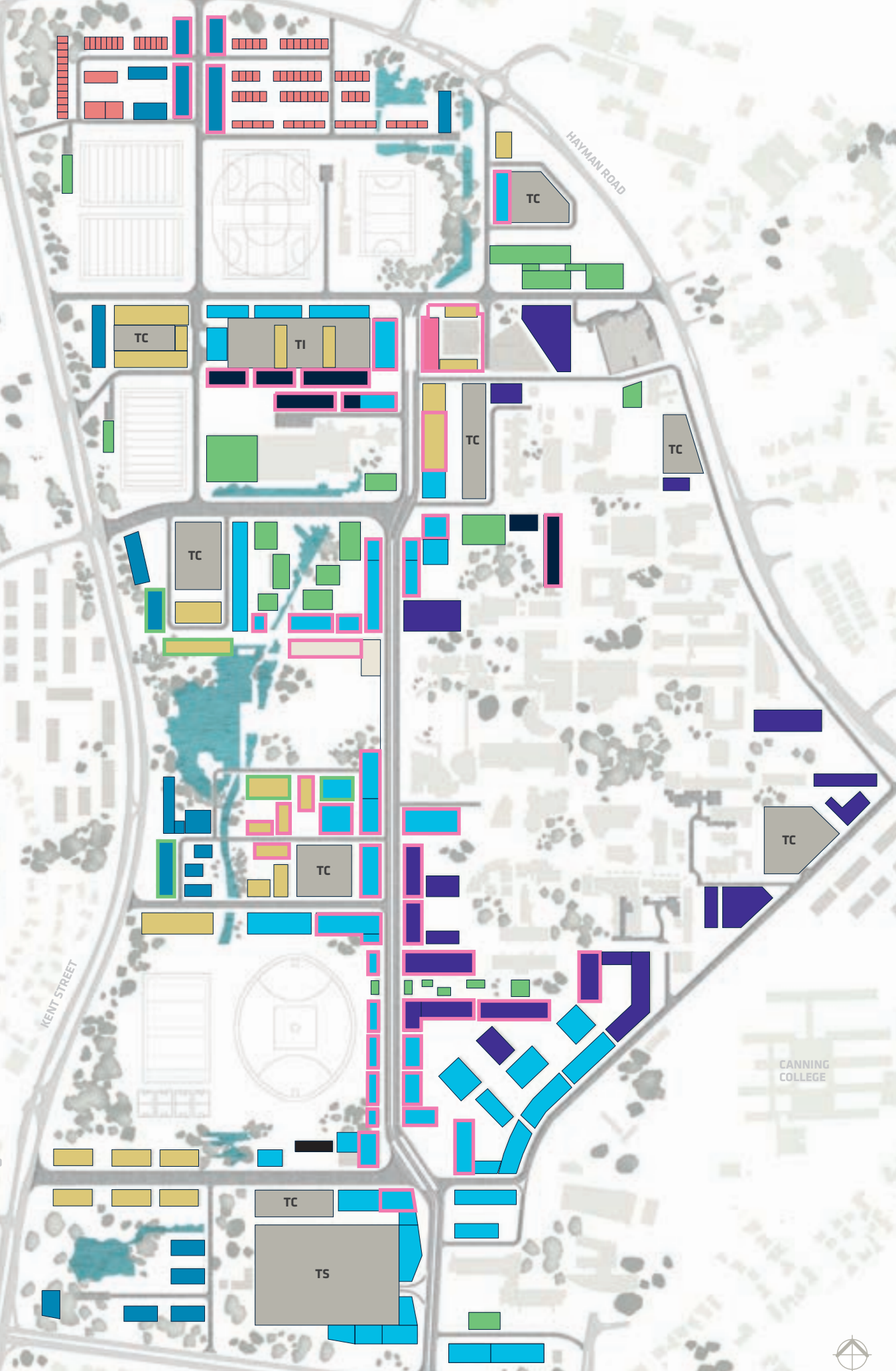
HAYMAN ROAD

KENT STREET

WATERFORD PLAZA

CANNING COLLEGE

MANNING ROAD



SOFT BUILDINGS

The Greater Curtin Master Plan identifies opportunities for discrete redevelopment within the traditional ‘academic core’. These opportunities are focused in locations where buildings have been identified to be nearing the end of their useful life, presenting early catalyst sites to ‘kick start’ the integration of the academic core within Greater Curtin. Further scrutiny of redevelopment opportunity within the academic core is to be undertaken by a separate study.

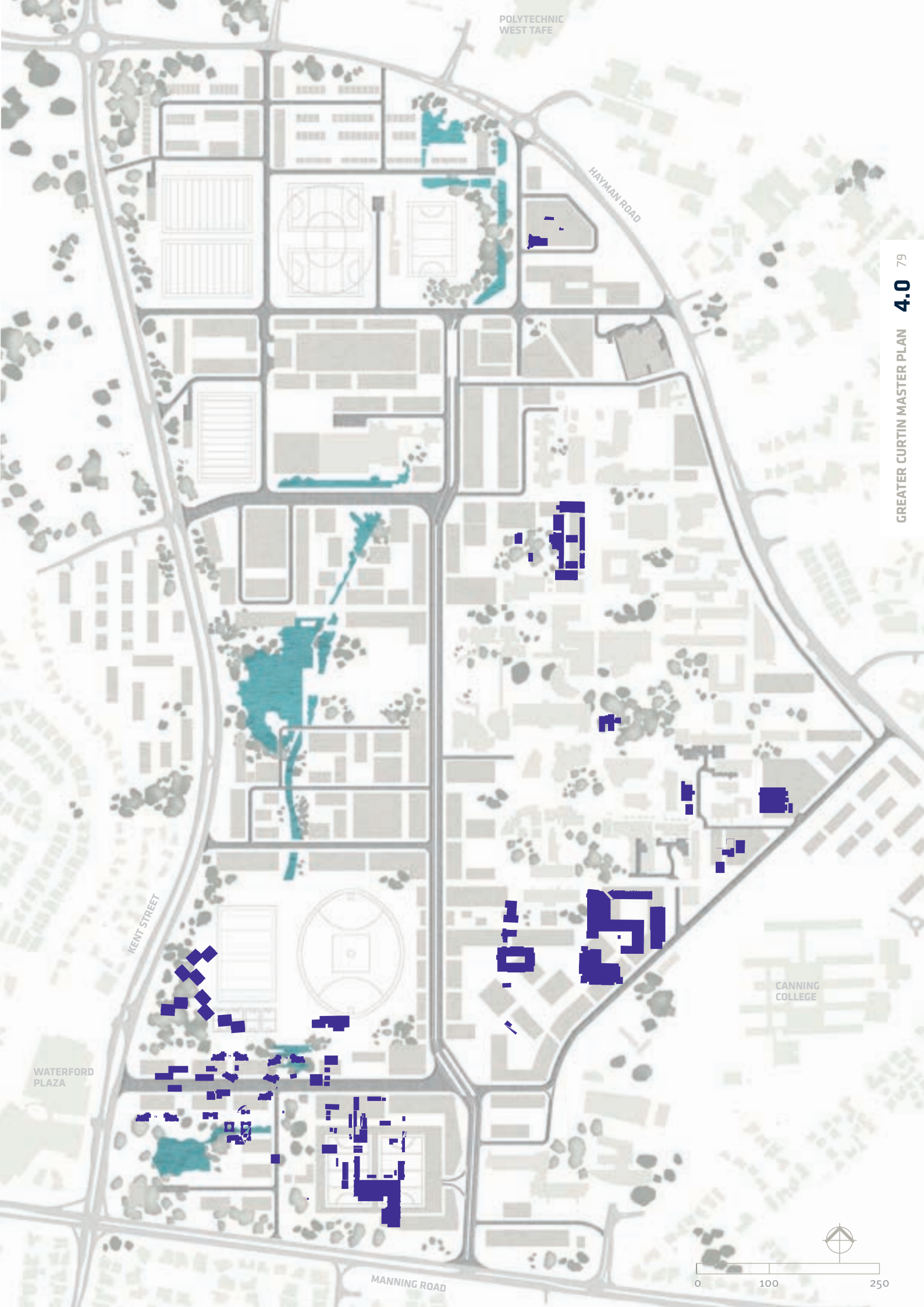
HAYMAN ROAD

KENT STREET

WATERFORD
PLAZA

CANNING
COLLEGE

MANNING ROAD



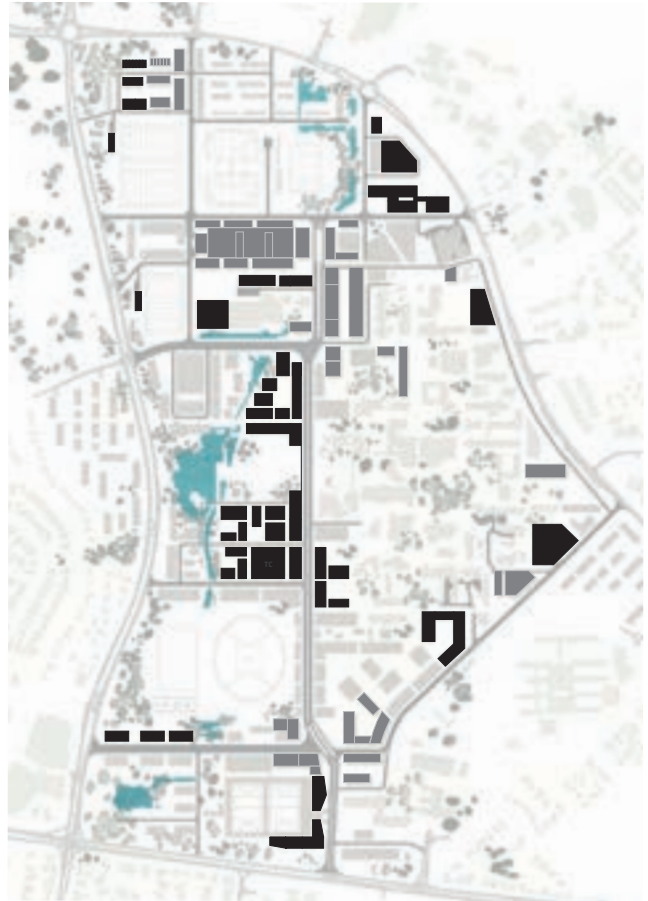
DELIVERY

The following staging plans identify the proposed sequencing for the delivery of development across the site in four stages: 0-5 years, 6-10 years, 11-15 years and 16-20 years.

The proposed delivery sequencing builds around a series of early catalyst opportunities that will 'kick start' development around the northern and southern transport nodes.



STAGE 1
0-5 YEARS



STAGE 2
6-10 YEARS

















STAGE 3
11-15 YEARS



STAGE 4
16-20 YEARS

Land Use

	AC. Academic
	CO. Community Space
	RA. Residential Apartment
	RC. Residential Academic
	RE. Retail (ground floor only)
	RH. Residential Hotel
	RO. Residential Short Stay
	RS. Residential Students
	RT. Residential Townhouse
	OF. Office/Commercial
	TC. Transport Car Park
	TI. Transit Interchange
	TS. Transit Stabling
	Parcel Boundary

* Denotes Ground Floor land use for certain community use buildings

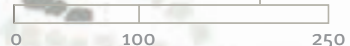
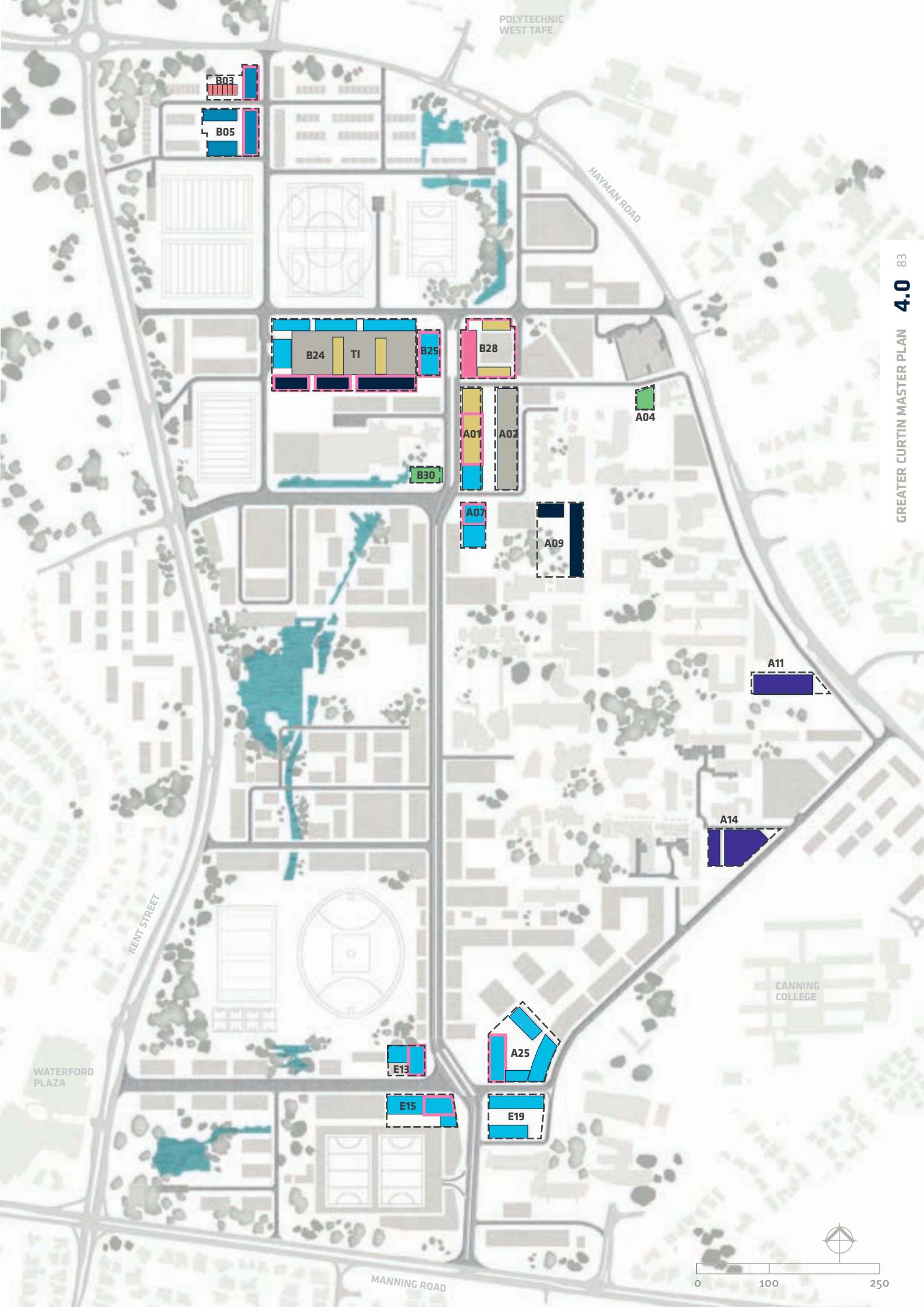
STAGE 1: 0-5 YEARS

Stage 1 delivers key public transport infrastructure that creates northern and southern transit hubs, establishing strong arrival points and encouraging development to grow.















In Greater Curtin North, a new bus interchange establishes a northern gateway, framing Main Street and catalysing large and small format retail and office space. Significant student residential is also established, consolidating activity in Greater Curtin North and further supporting retail development.

In Greater Curtin South, significant academic activities and commercial offices establish around a transit-enabled square, harnessing and enhancing synergies between research and industry.

Parcel Number	Parcel Area (m ²)
A01	3,822
A02	3,822
A04	618
A07	1,898
A09	6,061
A11	2,506
A14	3,390
A25	7,264
B03	2,455
B05	4,458
B24	18,682
B25	1,703
B28	5,348
B30	752
E13	2,042
E15	3,847
E19	4,181
TOTAL	72,849



Land Use

	AC. Academic
	CO. Community Space
	RA. Residential Apartment
	RC. Residential Academic
	RE. Retail (ground floor only)
	RH. Residential Hotel
	RO. Residential Short Stay
	RS. Residential Students
	RT. Residential Townhouse
	OF. Office/Commercial
	TC. Transport Car Park
	TI. Transit Interchange
	TS. Transit Stabling
	Parcel Boundary

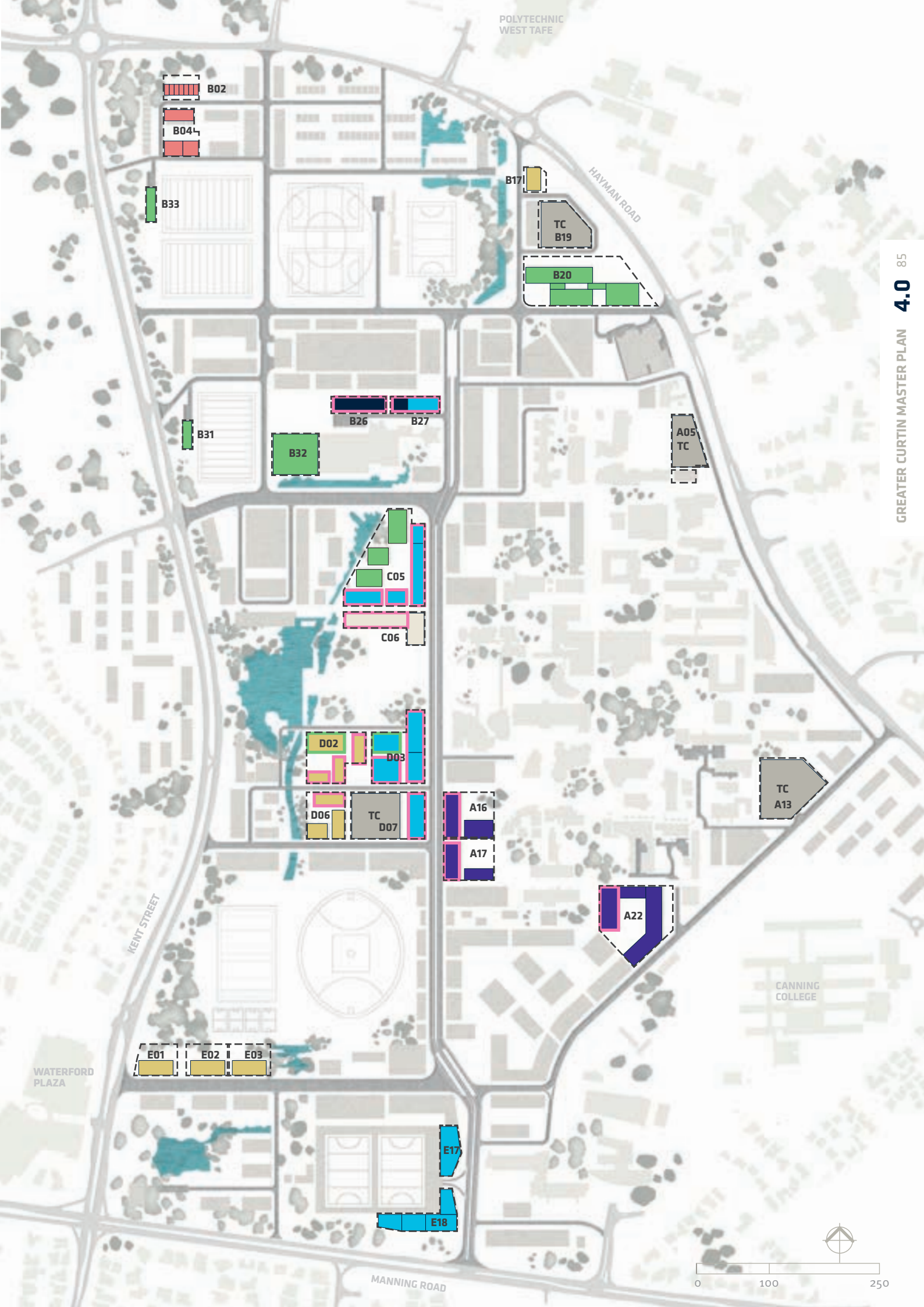
* Denotes Ground Floor land use for certain community use buildings

STAGE 2: 6-10 YEARS

Stage 2 strengthens and diversifies the core of Greater Curtin; further defining Main Street as a central spine framed by commercial and community development. Key east-west bands of development are established, extending the traditional academic core, blurring the boundary between city and university and framing key parkland and strengthening the ceremonial heart.

Increased residential development diversifies Greater Curtin's population and supports the expansion of the indoor sporting centre. Key parking structures are delivered; further unlocking redevelopment potential and supporting a movement hierarchy that prioritises people over cars.

Parcel Number	Parcel Area (m ²)
A05	2,608
A13	5,547
A16	4,072
A17	3,749
A22	8,211
B02	1,448
B04	2,690
B17	1,059
B19	5,679
B20	10,019
B26	1,830
B27	1,999
B31	439
B32	3,390
B33	530
Co5	10,501
Co6	2,698
Do2	4,550
Do3	5,458
Do6	3,098
Do7	6,041
E01	2,147
E02	2,309
E03	2,309
E17	1,550
E18	2,895
TOTAL	96,826



WATERFORD PLAZA

KENT STREET

HAYMAN ROAD















MANNING ROAD

CANNING COLLEGE

0 100 250



Land Use

	AC. Academic
	CO. Community Space
	RA. Residential Apartment
	RC. Residential Academic
	RE. Retail (ground floor only)
	RH. Residential Hotel
	RO. Residential Short Stay
	RS. Residential Students
	RT. Residential Townhouse
	OF. Office/Commercial
	TC. Transport Car Park
	TI. Transit Interchange
	TS. Transit Stabling
	Parcel Boundary

* Denotes Ground Floor land use for certain community use buildings

STAGE 3: 11-15 YEARS

Stage 3 further extends east-west bands of development, framing key streets and parkland. In Greater Curtin South, the southern transit node is augmented with the establishment of a strong arts and research presence.

The delivery of additional parking structures liberates further land for redevelopment and community enjoyment. In Greater Curtin South, a light rail stabling facility provides the opportunity to further establish partnerships in research and industry.

Parcel Number	Parcel Area (m ²)
A03	879
A08	1,807
A10	3,880
A12	3,372
A19	3,486
A20	9,607
A23	4,485
A24	4,944
B01	2,391
B22	4,010
B23	2,656
C02	6,619
C04	7,876
D01	3,379
D04	1,704
D05	1,965
D09	2,819
D10	2,819
D11	592
E04	2,449
E05	2,145
E06	2,145
E12	1,609
E14	3,936
E16	20,700
TOTAL	102,274

HAYMAN ROAD

B01

B22
B23

A03

TC
C02
C04

A10

A08

A12

D01
D04
D05

D09
D10
D11

A19

A20
A23
A24

CANNING
COLLEGE

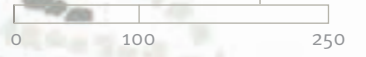
KENT STREET

WATERFORD
PLAZA















E04
E05
E06

TC E14
TS E16

MANNING ROAD



Land Use

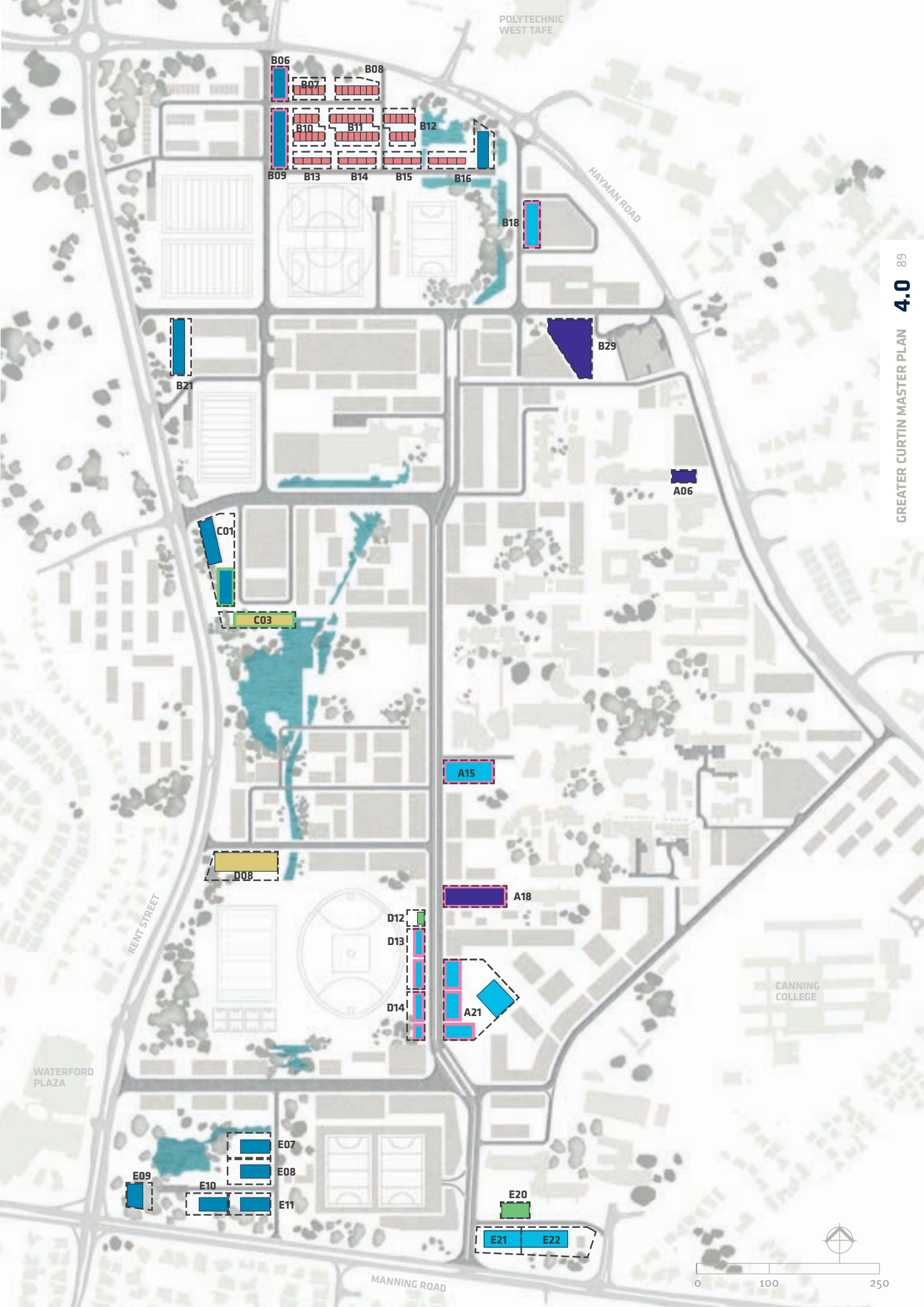
	AC. Academic
	CO. Community Space
	RA. Residential Apartment
	RC. Residential Academic
	RE. Retail (ground floor only)
	RH. Residential Hotel
	RO. Residential Short Stay
	RS. Residential Students
	RT. Residential Townhouse
	OF. Office/Commercial
	TC. Transport Car Park
	TI. Transit Interchange
	TS. Transit Stabling
	Parcel Boundary

* Denotes Ground Floor land use for certain community use buildings

STAGE 4: 16-20 YEARS

Stage 4 augments the diversification of Greater Curtin's residential population, with the establishment of a variety of living options throughout the city. Additional office commercial and retail development strengthens Main Street and a community hub is created around the resources and chemistry research hub.

Parcel Number	Parcel Area (m ²)
A06	469
A15	1,961
A18	2,258
A21	7,813
B06	907
B07	1,149
B08	1,535
B09	1,596
B10	1,793
B11	2,789
B12	1,793
B13	1,043
B14	1,043
B15	1,043
B16	2,201
B18	1,293
B21	1,957
B29	3,268
C01	4,237
C03	1,992
D08	3,338
D12	440
D13	1,753
D14	1,395
E07	1,931
E08	1,931
E09	1,089
E10	1,559
E11	1,559
E20	752
E21	2,028
E22	3,532
TOTAL	63,447



WATERFORD PLAZA

KENT STREET

HAYMAN ROAD

CANNING COLLEGE

MANNING ROAD

0 100 250



4.3 MOVEMENT

Greater Curtin will prioritise people and public transport over cars. The master plan establishes an integrated movement network that provides access to convenient, efficient and attractive public transport, and streets that are safe and walkable, effectively connecting the Greater Curtin community to its neighbourhood and the broader region.

The network is founded on three overarching principles:

- **Connect Greater Curtin with Perth**
 - Make sure transport connections maximise convenient access to Greater Curtin from key locations, including Perth's CBD, the Fremantle/southwest region and the Cannington/southeast region
 - Anticipate and enable the establishment of future mass transit, in particular the 'Knowledge Arc', connecting Greater Curtin with Perth's CBD and the University of Western Australia in Crawley
 - Make sure the design of the local network is integrated with, and supports the needs of, the broader public transport network, being both convenient and efficient and contributing to the minimisation of travel times. This will be delivered through transit enablement and prioritisation within Greater Curtin
 - Embed Greater Curtin within the state's Moving People Network
 - Facilitate local and district cycling trips by enhancing connections with the Perth Bicycle Network.

- **Create streets and movement networks for people**
 - Prioritise pedestrians, cyclists and public transport within the street structure of Greater Curtin
 - Make sure there is a positive interface between land use activities and the movement network to maximise safety, accessibility and convenience for users
 - Deliver a clear hierarchy and legible network through appropriate street design and make sure cars complement rather than dominate activity in the street
 - Provide centralised car parking provision integrated within precincts, enhancing walkability and ensuring priority is maintained for public transport, cyclists and pedestrians
 - Designate kerb-side parking for short-term use
 - Discourage car parking access from Main Street and encourage traffic to assign to east-west streets.
- **Embed the provision of convenient public transport within the structure of Greater Curtin**
 - Future proof key streets to accommodate mass transit opportunities
 - Locate transport stops and interchanges strategically to optimise public transport catchments, create north and south nodes of activity and maximise spatial coverage
 - Make sure early catalyst projects anticipate future opportunities for the delivery of effective public transport e.g. LRT.







The network includes a clear and interconnected set of movement networks:

- A multi-modal public transport network that connects Greater Curtin to its region
- A strong urban street structure with a legible hierarchy
- A connected pedestrian and cycle network
- A parking strategy that supports the prioritisation of public transport within the heart of Greater Curtin.



SOURCE: CHRISTOPHER FREDRICK JONES



-  Existing External Network
-  Primary Street
-  Main Street
-  Secondary Street
-  Tertiary Street
-  Possible Bus/Transit Only

STREET NETWORK

The master plan delivers an urban street network that is designed for people rather than the optimisation of traffic capacity, vehicle speeds and the through movement of traffic.

The network:

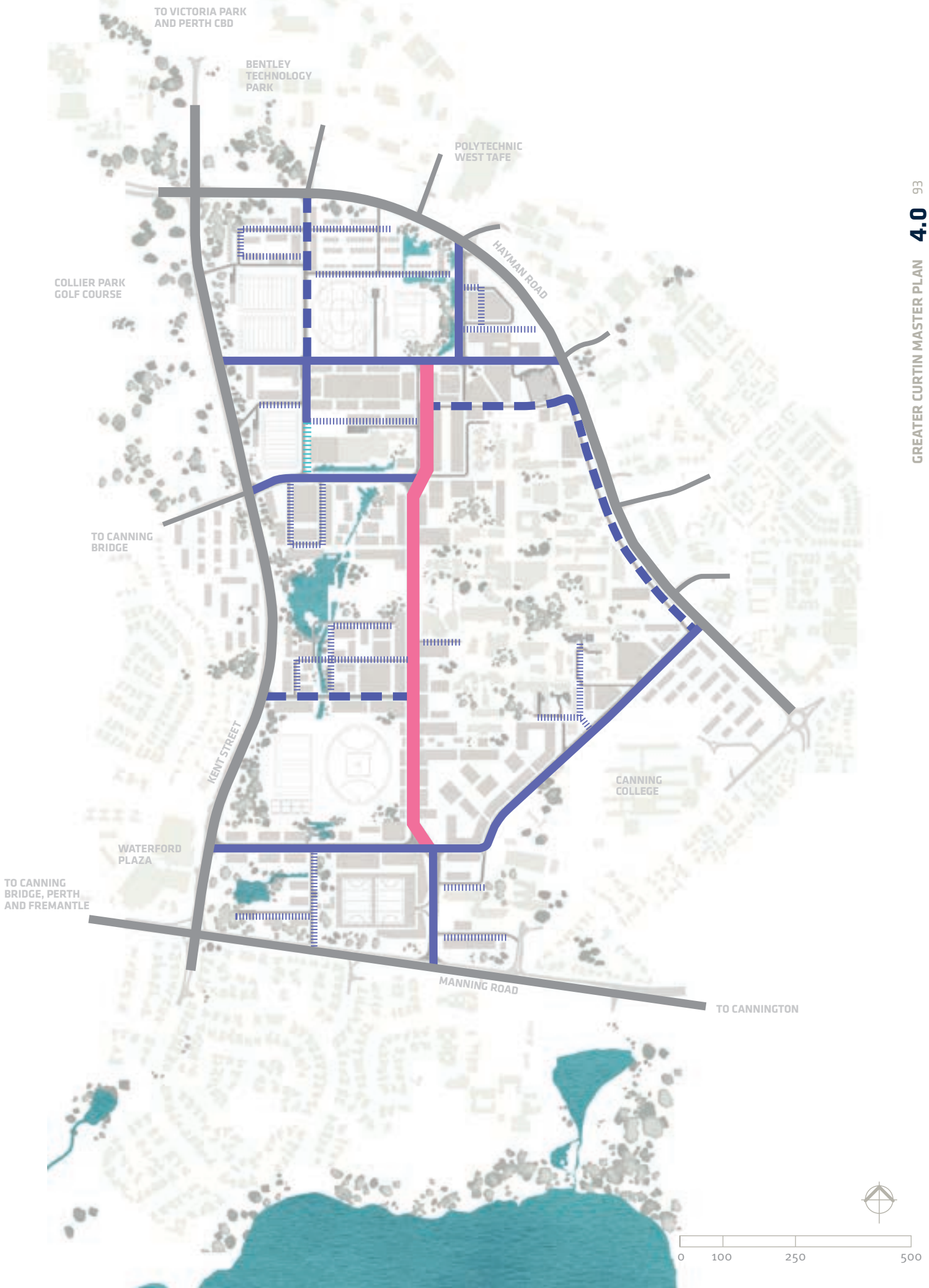
- Prioritises public transport
- Supports opportunities for pedestrian access, use and movement along streets
- Promotes shared environments in key locations and where appropriate, minimising street widths and segregating transport modes
- Delivers tight ‘urban’ solutions to the alignment and design of intersection arrangements to optimise safe and convenient use by pedestrians and cyclists
- Presents solutions that minimise segregation, physical constraints, signage and level changes in strategic locations
- Accepts capacity constraints within reasonable limits that will serve as tools for vehicle trip demand management.

STREET HIERARCHY

The establishment of a legible street hierarchy ensures the role and function of streets within the network is clear. There are five typical street typologies in the hierarchy:

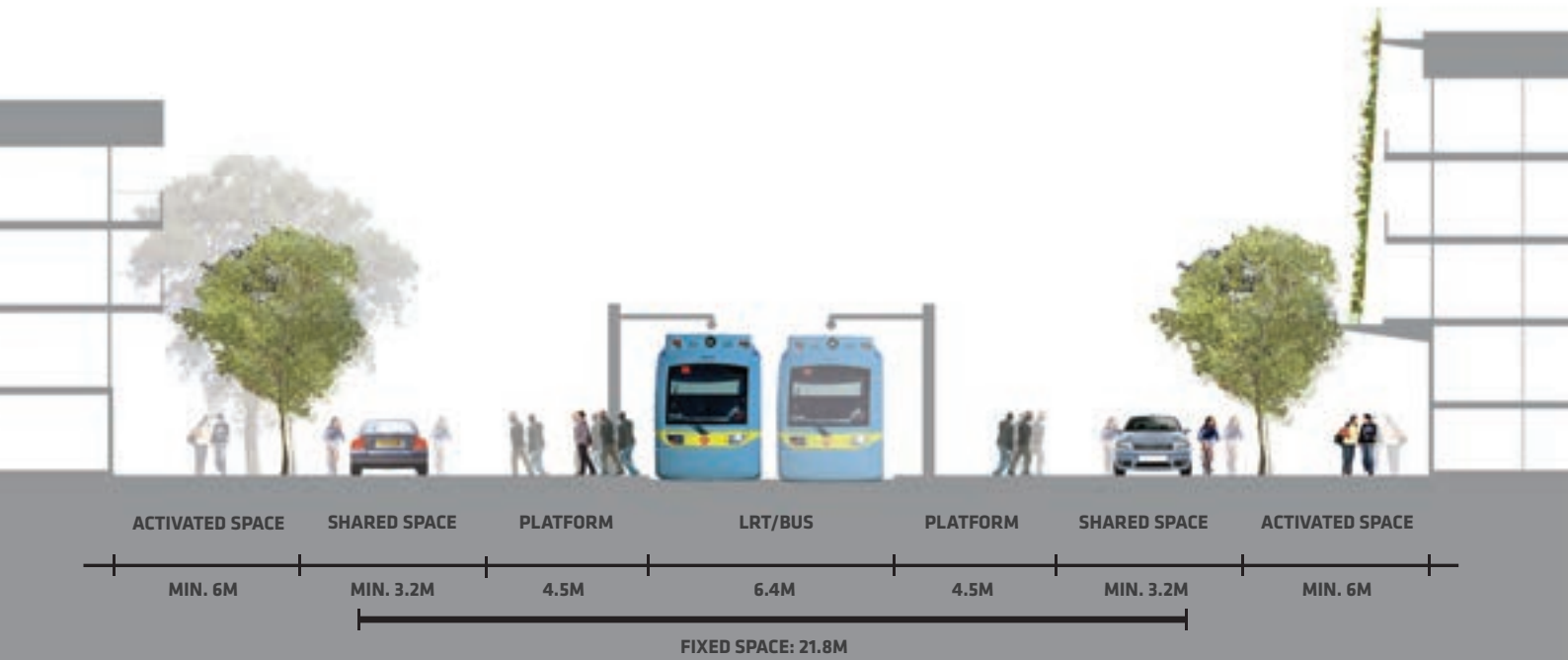
Hierarchy	Role and Function
Main Street	<ul style="list-style-type: none"> • Primary urban spine • Shared street • Key mass transit route and location of principal stops
Primary Street	<ul style="list-style-type: none"> • Neighbourhood access • Key connecting street to the external network
Secondary Street	<ul style="list-style-type: none"> • Neighbourhood access
Tertiary Street	<ul style="list-style-type: none"> • Local access
Bus Only Street	<ul style="list-style-type: none"> • Exclusive bus access to interchange

Typical cross sections illustrating these typical street typologies are illustrated in the following pages. These identify key transport elements that must be included. They do not show infrastructure/ servicing, water management or public realm details. Refer to Sections 4.4 and 4.5 for more information on these details.



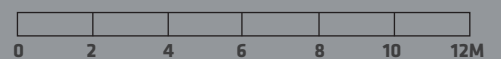
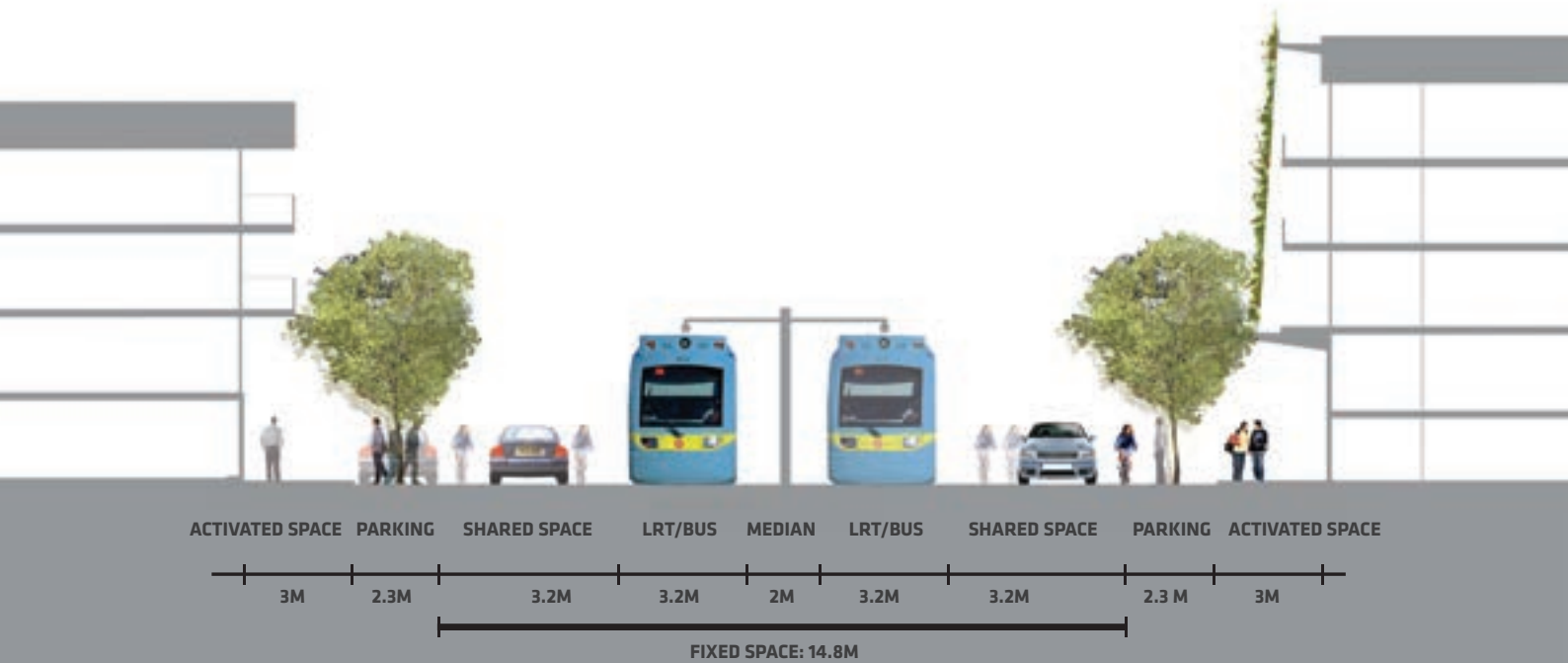


**TYPICAL SECTION: MAIN STREET
INCLUDING LRT STOP
21.8M FIXED SPACE**



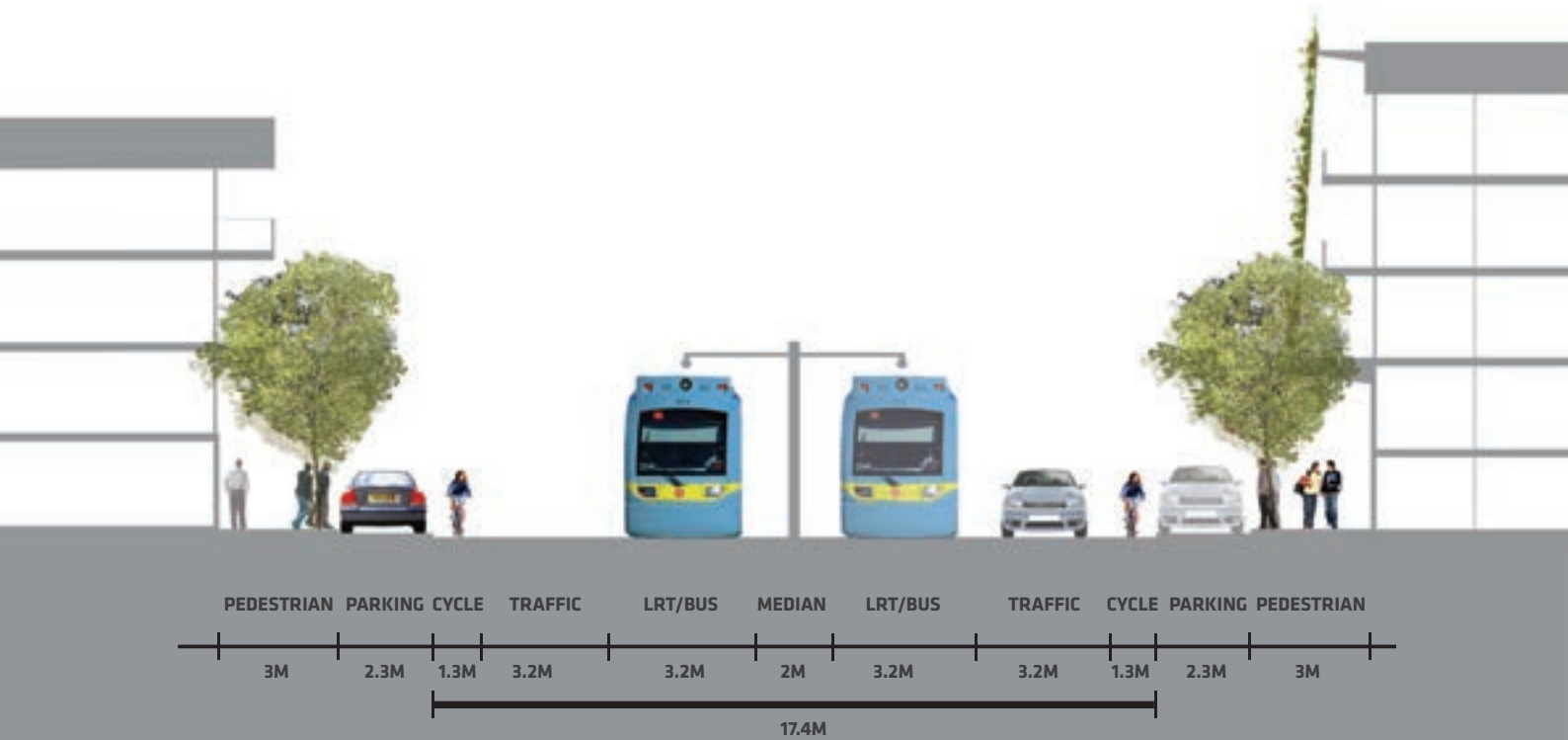


TYPICAL SECTION: MAIN STREET
14.8M FIXED SPACE



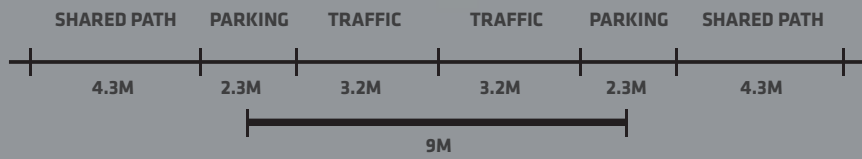


**TYPICAL SECTION: PRIMARY STREET
LRT AND BUS ENABLED
17.4M FIXED SPACE**



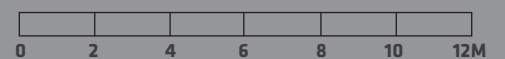
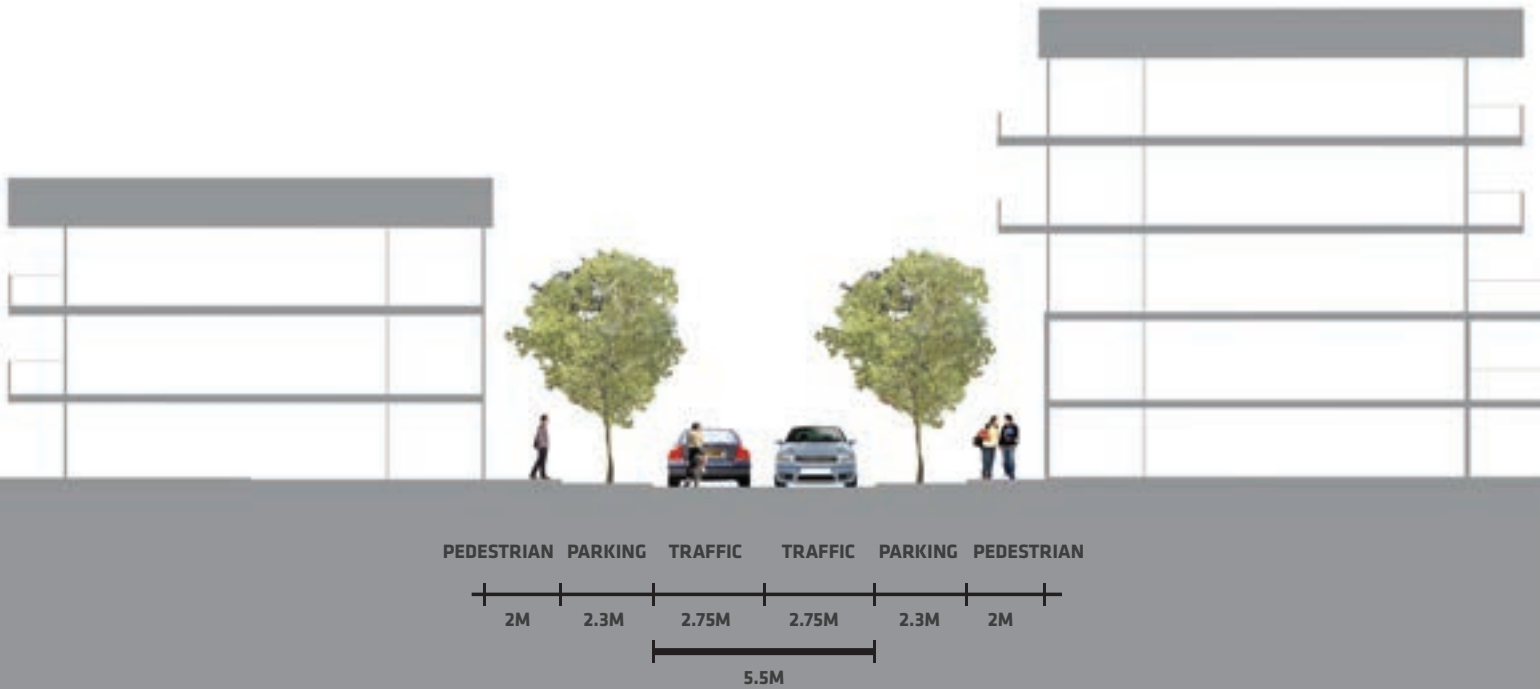


TYPICAL SECTION: PRIMARY
STREET BUS ENABLED
9M FIXED SPACE





**TYPICAL SECTION: SECONDARY STREET
5.5M FIXED SPACE**

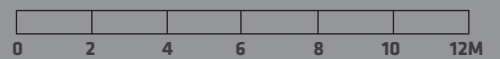
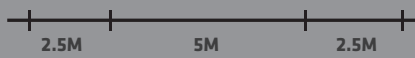










TYPICAL SECTION: TERTIARY STREET
5.0M FIXED SPACE



SHARED SPACE PEDS/EMERGENCY SHARED SPACE



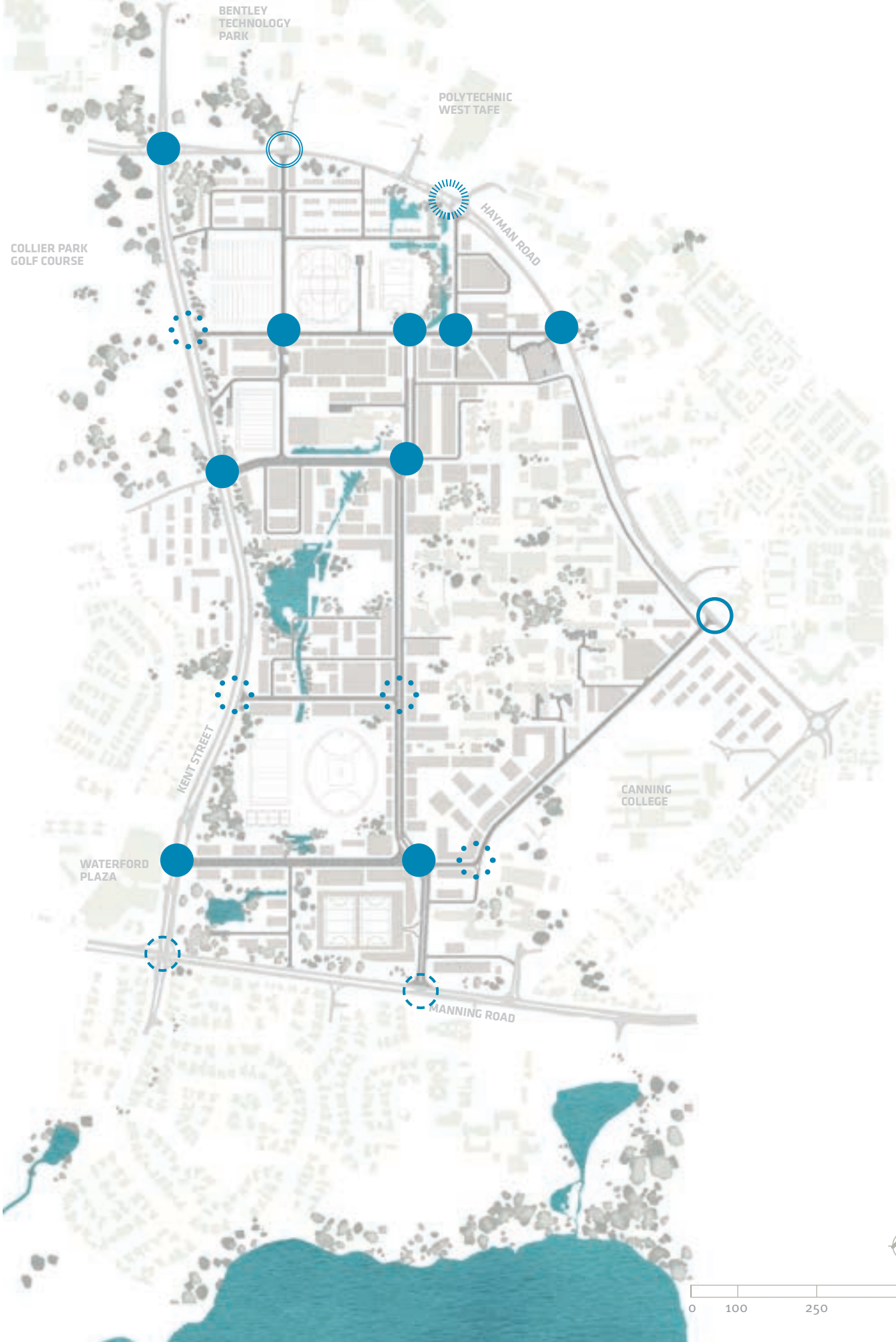
-  Traffic Signals likely to be required
-  Higher order traffic control likely to be required
-  Priority Control
-  Existing Signals
-  Left in, left out
-  Traffic signals required to enable priority for LRT

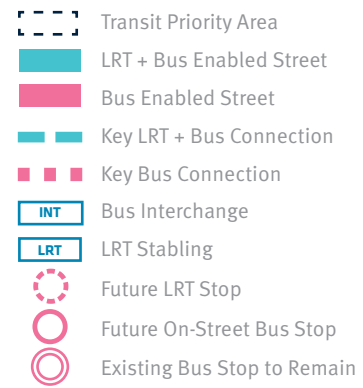
INTERSECTIONS

Supporting the overarching objectives of the movement network within the master plan, the design and approach to street intersections must contribute to the creation of a people orientated environment.

The following design characteristics assist in delivering this outcome:

- Intersection configurations that facilitate convenient and safe pedestrian movement by minimising their physical width, favouring simple perpendicular arrangements and avoiding roundabouts within Greater Curtin. This is because the geometric footprint of roundabouts are relatively large and they do not provide any priority to pedestrians
- Appropriate traffic control that prioritises public transport and minimises waiting time for pedestrians crossing
- Accepts capacity constraints within reasonable limits, that will serve as tools for vehicle trip demand management.





PUBLIC TRANSPORT NETWORK

The master plan delivers an efficient and convenient public transport network to the heart of Greater Curtin that:

- Maximises the public transport catchment and accessibility across Greater Curtin
- Delivers a high quality user experience
- Provides seamless and legible interchange between modes of transport
- Prioritises the need of an effective public transport network over private vehicles
- Interfaces with and supports appropriate land use activities
- Contributes to the creation of a high quality and strong urban character
- Sets an outstanding local context to tie into future external transit priority facilities.

Key features of the network include the provision of:

- A mass transit spine and series of light rail enabled streets that future proof Greater Curtin to take advantage of potential extension and expansion of light rail
- A strategically located and well-designed new bus interchange and series of bus enabled streets to support a comprehensive and flexible future transit network.

FUTURE LIGHT RAIL

A series of light rail enabled streets anticipate a future mass transit system through the heart of Greater Curtin. A primary north-south aligned route, along the proposed Main Street, provides an efficient alignment that optimises light rail efficiency and catchment. In addition, a number of external connections maximise connectivity from Greater Curtin to the anticipated future MAX light rail network, extending links outside the Greater Curtin boundary:

- To the north extending from Main Street North, along Hayman Road and Kent Street, connecting Polytechnic West TAFE, Bentley Technology Park, Victoria Park and Perth CBD
- Extending from Main Street South along Manning Road, allowing a future connection east to Cannington
- To the west/southwest via two light rail enabled streets that provide opportunities for links via Jackson Road, and immediately north of Waterford Plaza or Manning Road.

Within Greater Curtin the network anticipates the delivery of two light rail stops, strategically located to maximise access within a 400m radius walking catchment. These include:

- North Greater Curtin – A northern stop, co-located with a new bus interchange and providing access to key retail, commercial, civic, academic, formal recreation, leisure and residential activities
- South Greater Curtin – A southern stop, providing access to key retail, commercial, cultural, academic, formal recreation, leisure and residential activities.

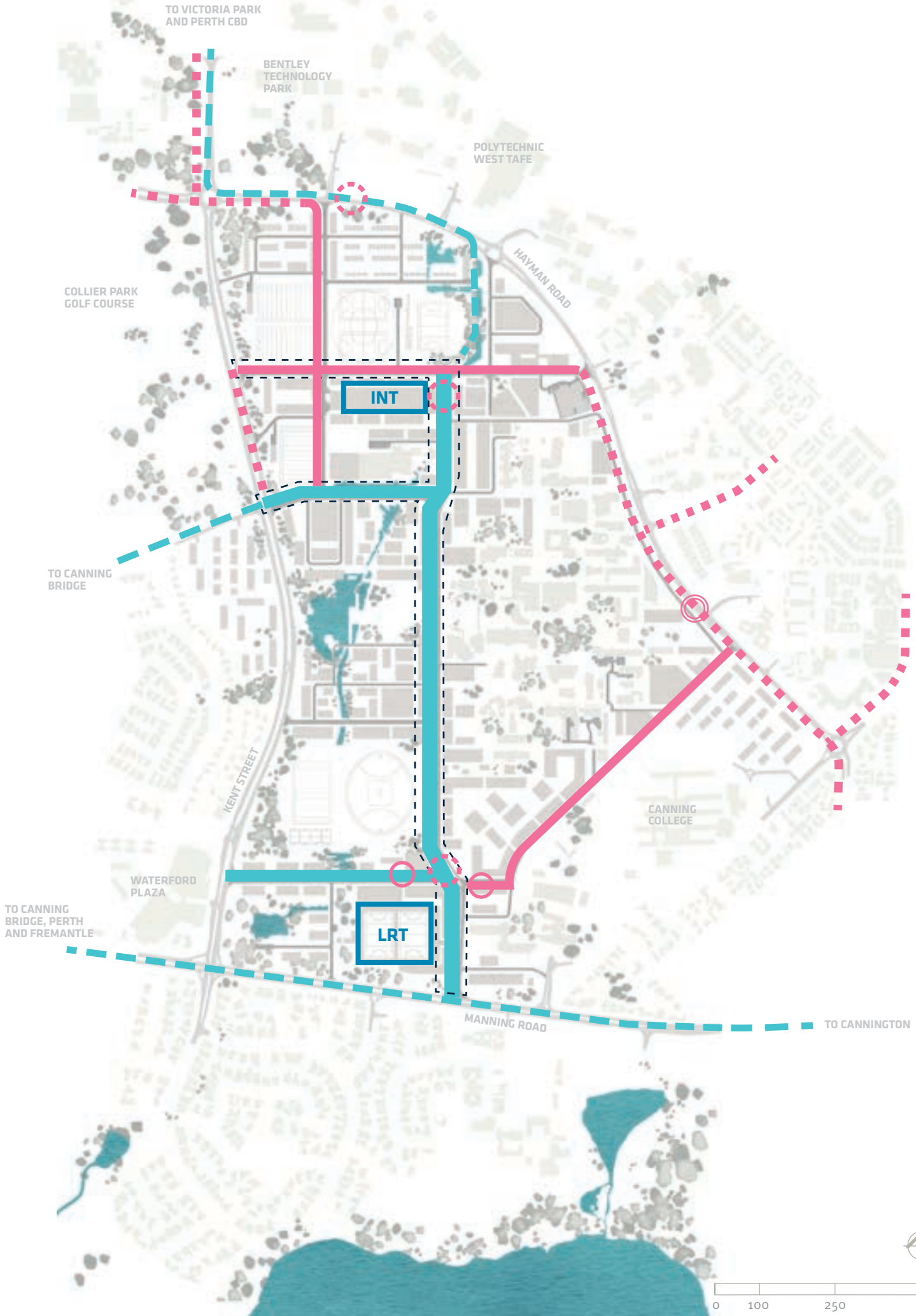
Potential also exists for an additional stop along Hayman Road (in the vicinity of Brodie-Hall Drive), providing increased connectivity between Greater Curtin and Bentley Technology Park.

BUSES

A series of bus enabled streets provide the framework for the delivery of a comprehensive, flexible and reliable prioritised bus network.

At the heart of this network a new centralised bus interchange is integrated into the Greater Curtin North neighbourhood, adjacent to the northern light rail stop. The concept for its design will deliver:

- Legible and seamless interchange between bus and light rail services
- Integration with, and convenient access to, Main Street and key retail, civic, commercial, health, recreational, leisure and residential activities
- A tested, functional layout that minimises land take and delivers a practical operational environment for the Public Transport Authority
- Flexible access arrangements that minimise circuitous bus movements into and out of the interchange
- A series of on-street bus stops support the interchange, providing convenient access to key destinations and seamless interface with the future light rail stops.



TO VICTORIA PARK AND PERTH CBD

BENTLEY TECHNOLOGY PARK

POLYTECHNIC WEST TAFE

HAYMAN ROAD

COLLIER PARK GOLF COURSE

INT

TO CANNING BRIDGE

KENT STREET

CANNING COLLEGE

WATERFORD PLAZA






LRT

TO CANNING BRIDGE, PERTH AND FREMANTLE

MANNING ROAD

TO CANNINGTON



-  Existing External Pedestrian Paths
– Enhance + Complete Network
-  Main Street Shared Environment
– Pedestrian Movement
Shared with Other Modes
-  Key Pedestrian Paths
in Street Reserve
-  Key Pedestrian Path –
Shared With Cycle Paths
-  Key External Connection

PEDESTRIAN NETWORK

The master plan delivers a comprehensive and connected pedestrian network that:

- Provides clear and legible connections along key desire lines
- Provides convenient access to and links important destinations such as retail, commercial, academic, cultural and recreational activities
- Integrates the traditional academic core with new neighbourhoods
- Makes walking a safe, comfortable and enjoyable option
- Promotes a healthy and active lifestyle for people living, working and playing in Greater Curtin.

Consisting of dedicated and on-street pathways, the proposed pedestrian network strengthens both north-south and east-west connectivity.

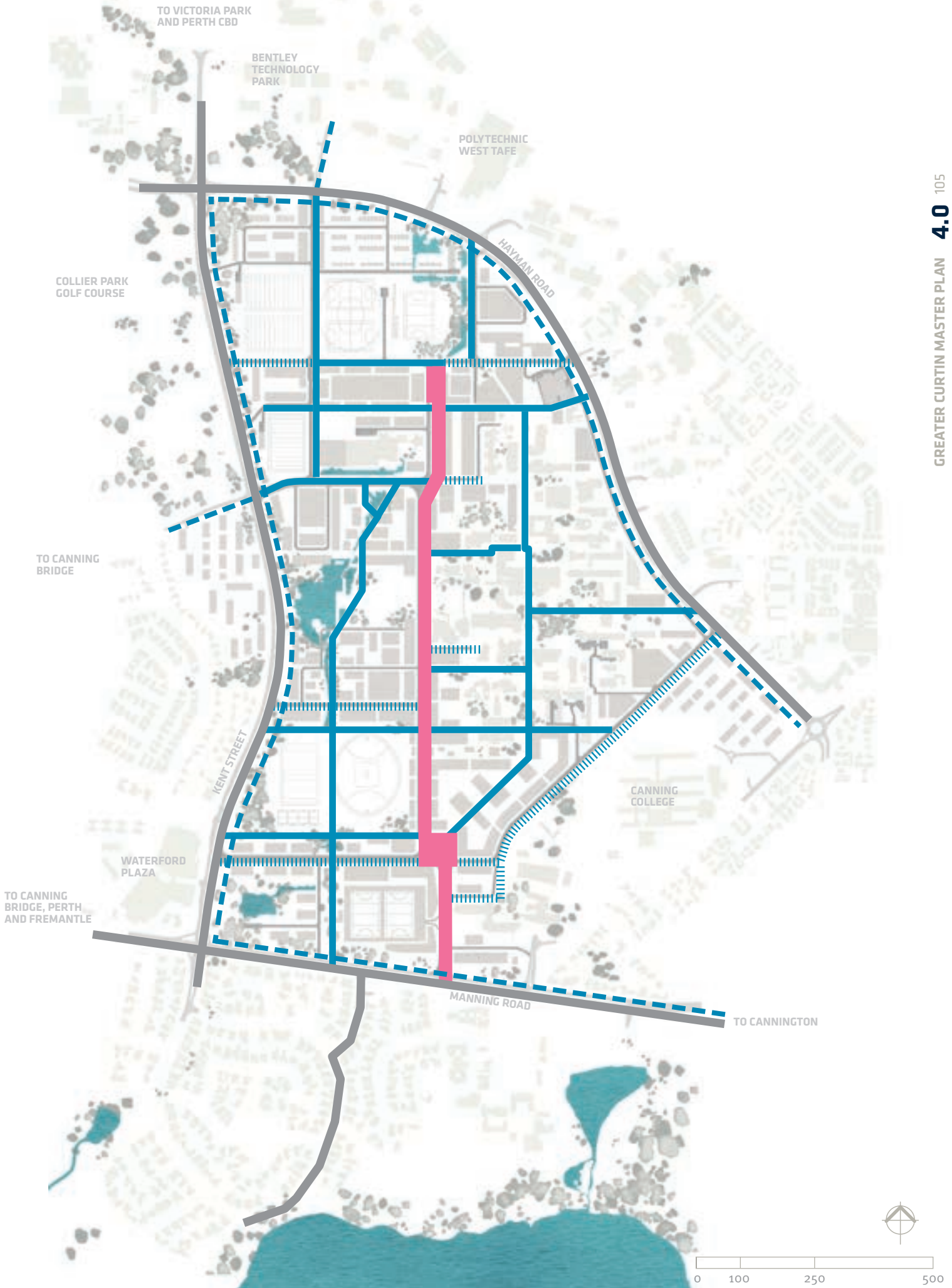
The three main north-south axes are defined by:



- The Corso, a pedestrian and cyclist only street, providing a spine through the traditional academic core
- Main Street, a key structuring element of the master plan, which links retail, commercial, civic and cultural activities
- The Living/Knowledge Stream, a pedestrian priority corridor which meanders through formal and informal recreational and parkland spaces.

A series of complementary east-west links maximise connectivity and route choice between The Corso, Main Street and Living/Knowledge Stream, and extend strong connections to key destinations beyond the edges of Greater Curtin.

All pedestrian connections will contain the following typical ingredients to maximise safety, legibility and comfort:

- Provision of appropriate lighting
- Provision of shelter for weather protection and climate comfort
- Establishment of pathways edged by active land uses to promote passive surveillance
- Designed to deliver strong visual and physical legibility and wayfinding
- Deliver equitable access for all users.



-  Existing External Path – Upgrade to Copenhagen Style when demand warrants
-  Dedicated Cycle Lane On-Street
-  New Main Street Shared Environment – Cycle Movement Shared with Other Modes
-  Cycle Path – Shared with Pedestrians
-  Cycle Friendly Tertiary Streets
-  Cycle Hub (end-of-trip facilities)
-  Key External Connection

CYCLE NETWORK

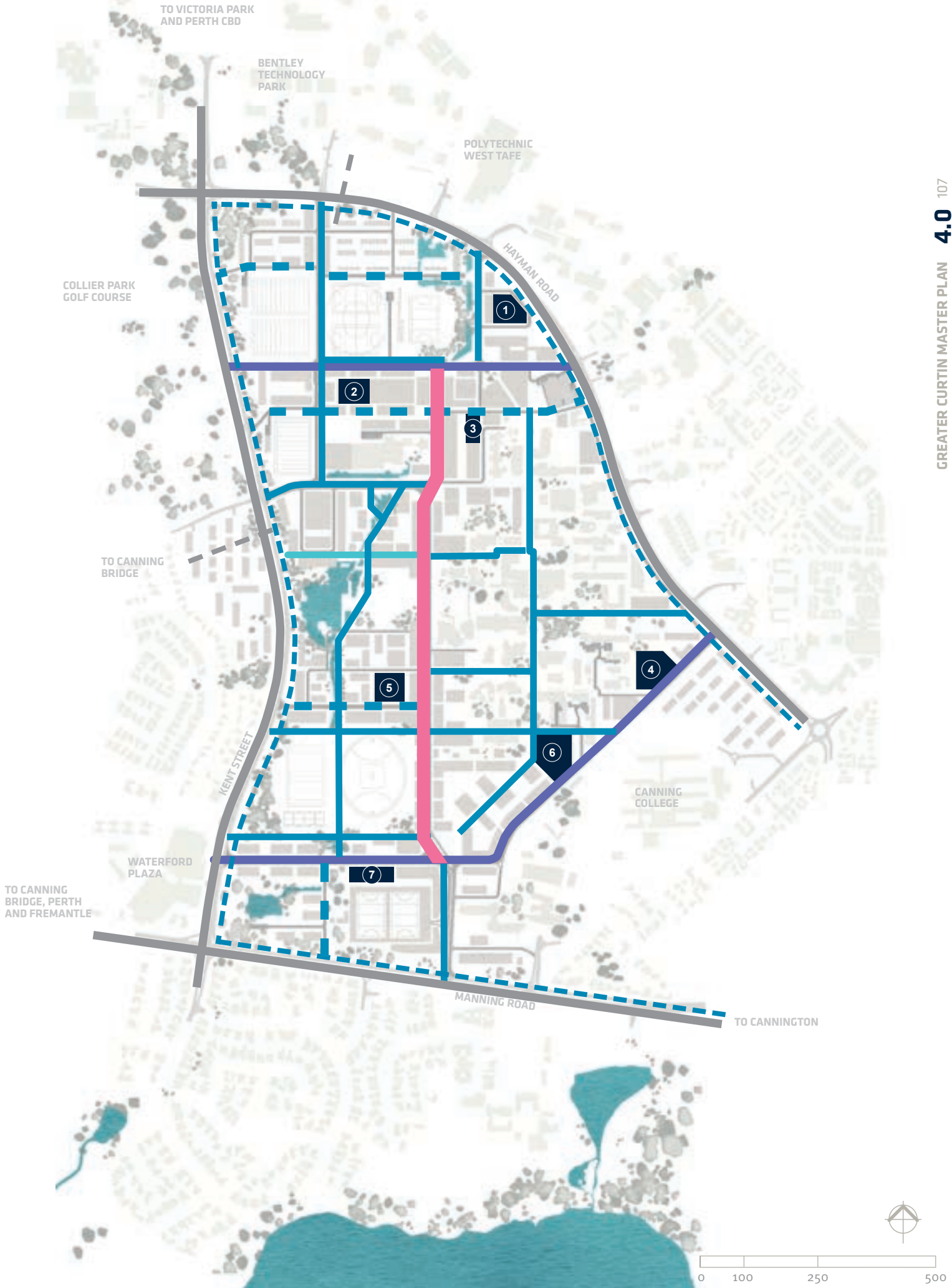
Complementing Greater Curtin’s pedestrian pathways, the master plan embeds a well-connected cycle network that:




- Accommodates cycle routes in dual-use paths (shared with pedestrians) to make efficient use of infrastructure and generate concentrated active movement areas for safety and security
- Ensures equitable access for all cycling ability levels
- Provides strong connections between key origins and destinations in and around Greater Curtin, and effectively links into the external/regional cycle networks
- Integrates the traditional academic core with new development areas
- Promotes a healthy and active lifestyle for people living, working and playing in Greater Curtin
- Provides high quality end-of-trip facilities.

At a detailed level the inclusion of cycle friendly design elements, such as kerbless streets, appropriately graded ramps and cycle ‘runnels’ on stairs is expected to maximise safety and accessibility.

Secure, sheltered, short and long-term cycle parking that is suitably distributed throughout Greater Curtin will be provided, making convenient access to core cycle routes and key destinations/activities. Standard cycle racks should be located within ten metres of building entrances to discourage use of trees or street furniture for cycle parking.

Ample cycling hubs are to be located within the master plan. These hubs will contain end-of-trip facilities such as showers and lockers, and are located within a five minute walk from a given building entry.



	Basement Parking
	Structured Parking
	Parking Area

Area	1	50 – 100
Area	2	700 – 900
Area	3	400 – 600
Area	4	400 – 600
Area	5	4,500 – 4,800
Area	6	150 – 250
Area	7	900 – 1,100

TOTAL 7,065 bays*

* Total parking bays based on recommendations for Curtin University's share of a reasonable parking cap for the Bentley-Curtin Specialised Activity Centre, provided on 8 March 2013. The total number and allocation of bays are subject to review by Curtin University and the WAPC.

PARKING STRATEGY

The master plan delivers a parking strategy that recognises the valuable role of private vehicles in contributing to urban places. The strategy incorporates a range of initiatives to accommodate vehicles in a way that complements, and contributes to lifestyles in Greater Curtin rather than dominating them. These include:

- The inclusion of a series of consolidated parking stations, strategically located at the edges of user 'catchments', reducing the extent of internal traffic movements and encouraging walking and use of the local public transport network
- Widely distributed on-street parking to assist in maintaining a slow moving traffic environment and contributing to effective levels of passive surveillance on the streets
- Basement parking in selected commercial and/or community use buildings, in support of the parking stations
- Basement parking for residential buildings
- Implementation of a parking dwell time and fee regime across all non-residential and visitor parking
- Making the majority of parking publicly available under the management of Curtin University, rather than being allocated to one user group, e.g. commercial tenants.

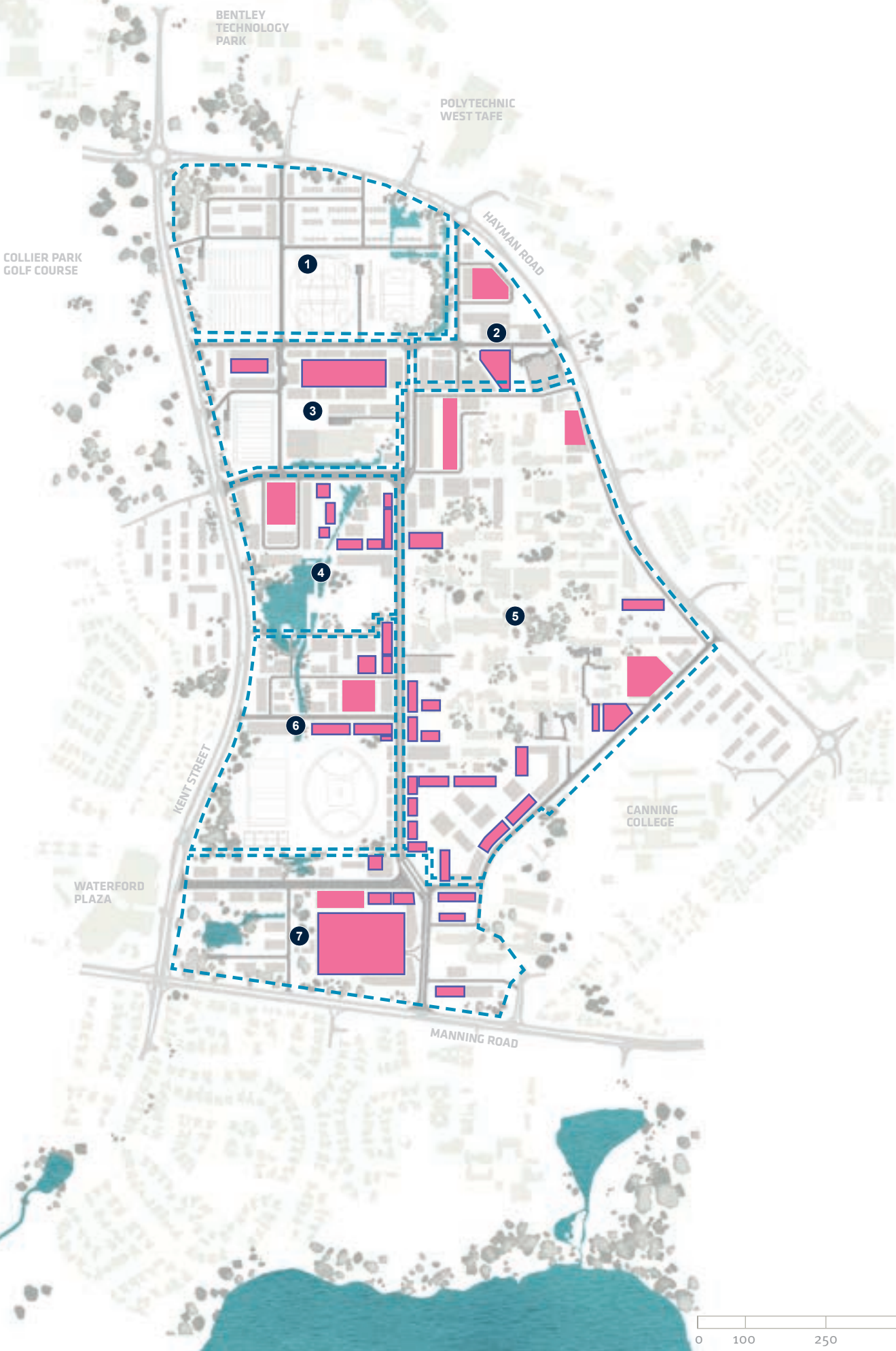
Reduced parking rates compared to industry standards for suburban centres have been applied to all development, due to the accessibility of high quality public transport and opportunities to walk and cycle.

For more information, refer to the Curtin Parking Strategy.

Assumptions for parking rates are summarised as follows:

Land Use Activity	Period	Parking Rate*
Commercial	Stage 1 (2013-2017)	1 bay per 60m ² GFA
	Stage 2-4 (2018-2032)	1 bay per 100m ² GFA
Retail 'target'	Stage 1 (2013-2017)	1 bay per 30m ² GFA
	Stage 2-4 (2018-2032)	1 bay per 50m ² GFA
Residential – private apartments	Stage 1-4 (2013-2032)	1 bay per dwelling
Residential – townhouses	Stage 1-4 (2013-2032)	1.2 bays per dwelling
Residential – student housing	Stage 1-4 (2013-2032)	1 bay per 7 students

*Gross rate assumption per bay = 28m²



4.4 FUTURE SYSTEMS

‘Future Systems’ is the term adopted to describe an approach to infrastructure that sets in place coherent, adaptive and integrated strategies for the development of a sustainable infrastructure network to which new development will be connected.

The foundations for this strategy establish the notion that infrastructure should be holistically planned, in anticipation of the future city, setting in place systems and networks with the ability to adapt to innovation and grow in response to the communities it supports.

Overarching principles inform the development of these systems, the core objective being the delivery of more sustainable outcomes. The ‘Future Systems’ strategy encompasses and sets out principles for the following services:

- Energy, including electricity, gas, heating and cooling, and renewable energy
- Water, including wastewater, rainwater, stormwater and irrigation.

Energy Objectives:

- Maximise efficiency and minimise consumption
- Aim for self-sufficiency
- Promote and integrate energy education throughout Greater Curtin.

Water Objectives:

- Increase efficiency and effectiveness of water use across Greater Curtin
- Implement a holistic approach to managing the water cycle in the context of future infrastructure systems and regional connectivity
- Adopt a self-sufficient approach to managing water in Greater Curtin
- Promote and integrate water education throughout Greater Curtin.

ENERGY

Greater Curtin will value energy as a key resource. The master plan establishes an integrated strategy that seeks to minimise overall energy demand and identify opportunities to diversify and centralise energy provision in favour of renewables over time and in response to need.

The strategy is grounded in three overarching objectives:

- Maximising efficiency
 - Achieve a significant reduction in greenhouse gas emissions as a result of design, construction and day-to-day operation
 - Optimise multiple use of energy through capture, recovery and reuse of energy outputs from different buildings/users
 - Locate service corridors appropriately to ensure easy access to present and future service networks, and minimise disruption to day-to-day activities of Greater Curtin.
- Aiming for self-sufficiency
 - Reduce the reliance on grid electricity through the use of a diverse portfolio of energy supply options, including on-site renewable energy generation.
- Promote and integrate energy education in all aspects of city life
 - Deliver solutions that showcase energy use throughout Greater Curtin
 - Provide opportunities to support the education and research focus of the university through the delivery of an adaptive platform.

The proposed strategy includes:

- An electricity distribution strategy
- A gas distribution strategy
- A heating and cooling distribution strategy
- A renewable energy strategy.

For more information, refer to the Greater Curtin Integrated Energy Infrastructure Strategy technical report.

- Stage 1 indicative transformer/substation
- Stage 2 indicative transformer/substation
- Stage 3 indicative transformer/substation
- Stage 4 indicative transformer/substation
- 11kV Electrical Network
- 22kV Electrical Network

ELECTRICITY DISTRIBUTION STRATEGY

Future Proofing the Network

Understanding the future requirements for the electrical network required to support the proposed development does not mean the infrastructure should be provided immediately. Importantly, infrastructure requirements can be planned for future installation.

Building out the site will facilitate a staged approach to the provision of new electrical infrastructure, as well as the ability to plan upgrades to the existing network. Based on this approach the existing infrastructure will exceed maximum capacity in Stage 3 of the master plan's delivery (as illustrated in the staging plans). A new 22kV network is planned to meet the required capacity.

Demand Management

Reducing the total energy consumption for Greater Curtin and implementing a peak demand management program will minimise the need for potential unplanned augmentations to the network.

The adoption and incorporation of the following design principles will minimise energy consumption associated with the new buildings:

- Application of passive solar design principles for all new buildings
- Addressing building orientation to minimise thermal loss due to infiltration from prevailing winds while taking advantage of natural ventilation
- The appropriate use of landscape to provide shade in summer and protection from wind in winter
- An appropriate response to the existing topography to optimise thermal mass and/or insulation
- Specification of energy efficient fittings, equipment and lighting systems
- Efficient control and effective maintenance systems, including monitoring of energy consumption.

Metering

If Curtin decides to lease its land but retain the sole connection to Western Power there will be a requirement to install National Measurement Institute (NMI) approved meters. The need for accuracy and consistency is to bring the sale of electricity in line with existing consumer protection legislation covering weights and measures used for sale of goods, and to ensure consumers pay for energy used.

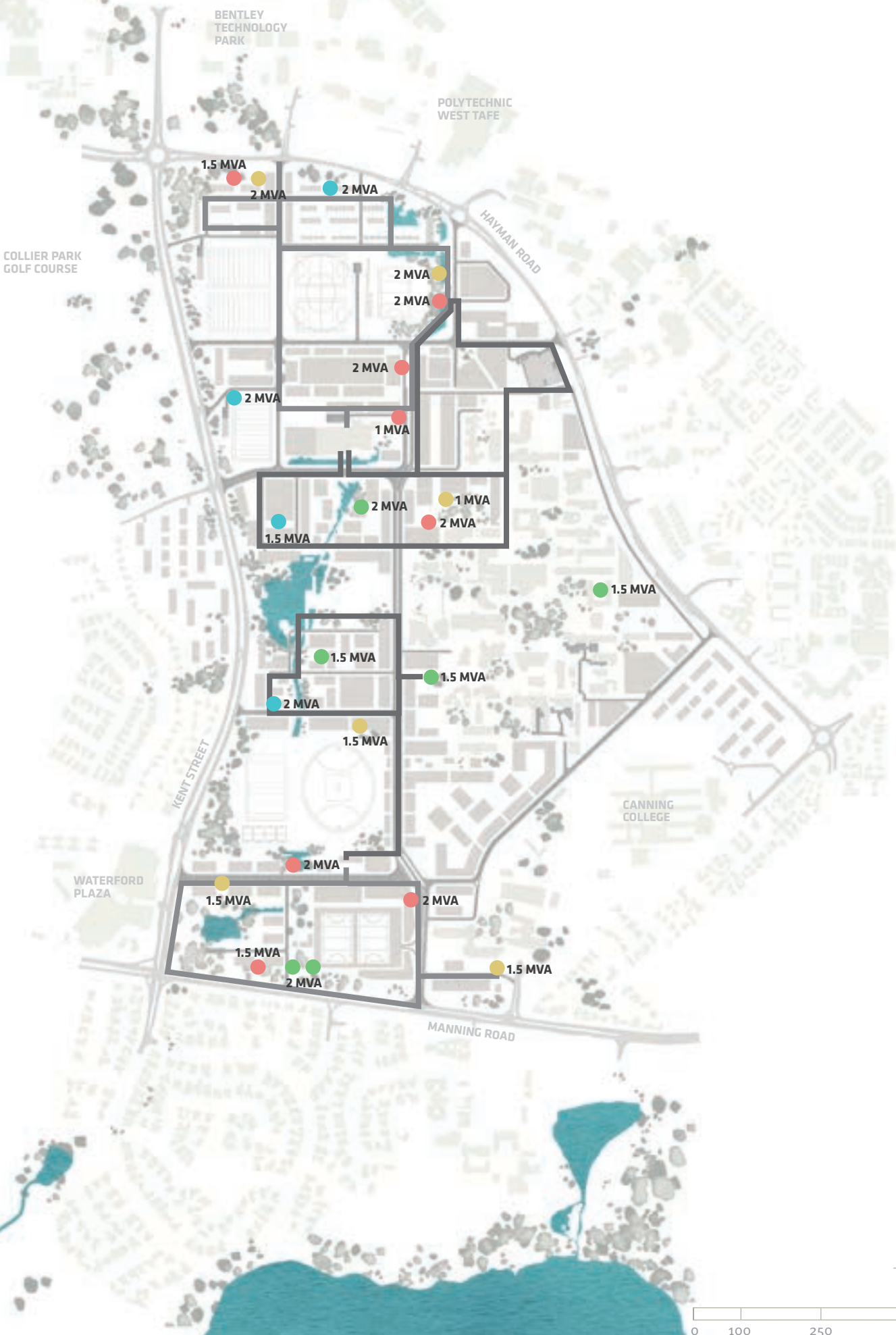
Future Works

In addition to electricity networks and cables there will be a need to provide additional electricity infrastructure including substations and transformers. It is preferred that these be accommodated either within new buildings. The space required for substations and transformers will be accommodated as follows:

- 80% of required space will be accommodated within buildings, with the following conditions:
 - Incorporate in commercial, community use, academic or car parking buildings
 - Locate on ground level and at the rear of building
 - Ensure direct access
- 20% of required space will be accommodated in freestanding, separate buildings, with the following conditions:
 - Provide a high quality built form outcome that promotes education and becomes a physical and tangible representation of Curtin's commitment to infrastructure innovation and research in the energy and infrastructure disciplines
 - Include an allowance for 10% of the building cost being dedicated to creative interpretation to support education.

Indicative locations and the anticipated pattern of distribution for the main transformers to supply the proposed site demand as currently calculated are illustrated on the adjacent plan. These locations may change in response to the exact location, and number of buildings being delivered and the load requirements of the staged developments.

The projected number and size of this plant should be regularly investigated to ensure that sufficient space is allocated.



- Existing High/Medium Pressure Gas Main Pipelines
- Indicative ATCO gas pipe line extension
- Central Energy Plant (CEP)
- Meter Set – New to Stage 1
- Stage 1 Gas Pipeline (by Utility Provider)
- Stage 1 Gas Pipeline (by Curtin)
- Stage 2 Gas Pipeline (by Utility Provider)
- Stage 2 Gas Pipeline (by Curtin)
- Meter Set – New to Stage 2
- Stage 3 Gas Pipeline (by Curtin)
- Stage 4 Gas Pipeline (by Curtin)
- ① Existing high & medium pressure gas pipelines
- ② Existing medium pressure gas pipelines

GAS DISTRIBUTION STRATEGY

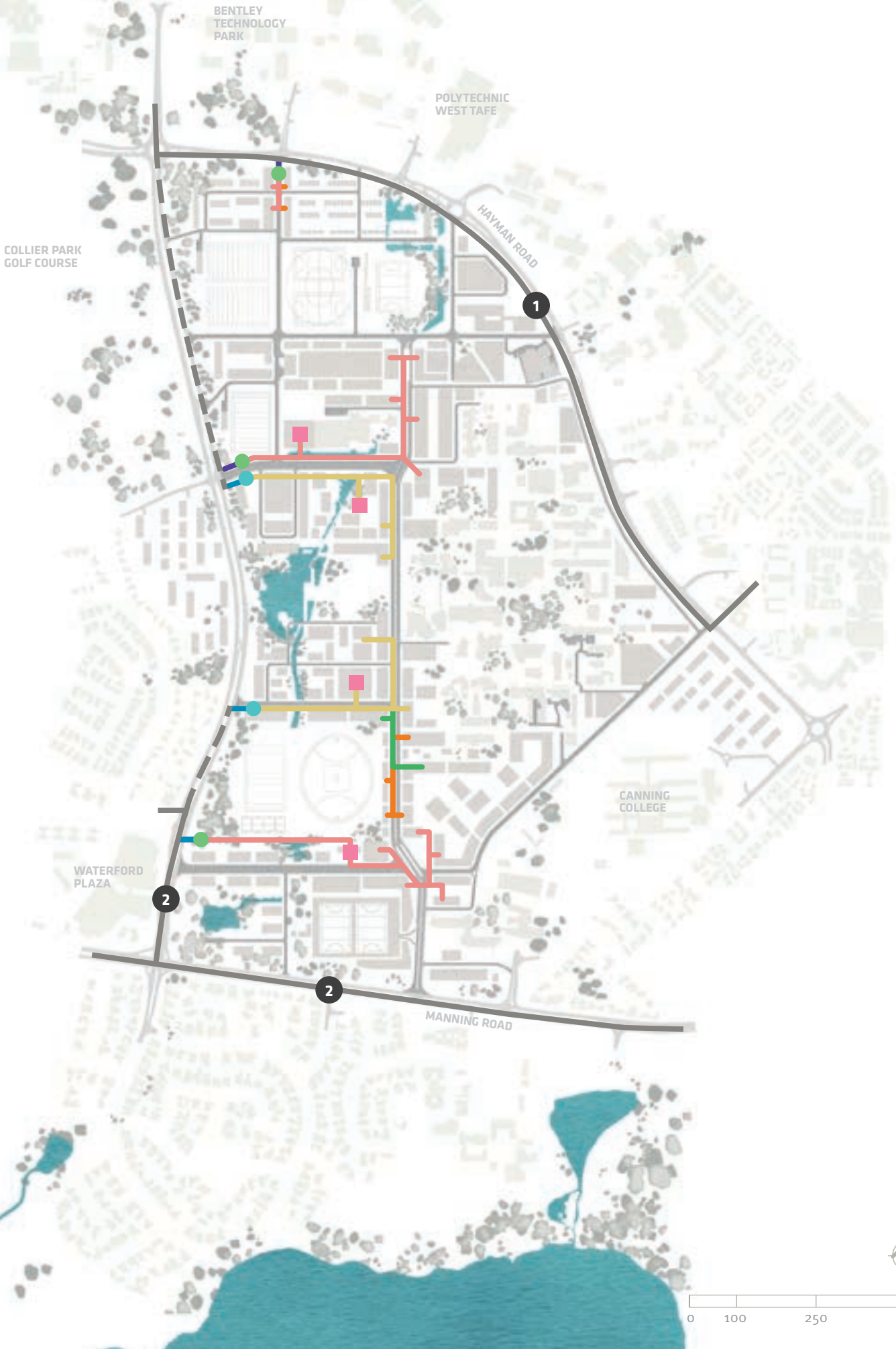
There is existing gas infrastructure on site with a high and medium pressure gas main along Hayman Road, and a medium pressure gas main along Manning Road. The capacity of the existing infrastructure is not expected to be sufficient to accommodate the proposed development and will require additional pipework to meet the projected demand.

It is proposed that gas will be used for the boilers to supply space heating and for commercial kitchens. As such, gas supply will be required for each of the four proposed central energy plants and buildings with commercial kitchens. This will require pipework to be installed during Stages 1 & 2 of the development.

Future Works

Gas infrastructure is split into two types, the pipes that supply gas to the site that are owned by the gas utility (ATCO) and the pipes used to reticulate gas throughout the site, owned by Curtin University.

Investigations are required to determine whether there is capacity in the supply of gas to the site to meet the projected demand at the completion of Stage 4. Should there be insufficient supply of gas to site then alternatives to gas boilers for space heating will need to be considered.



- Stage 1
- Stage 2
- Stage 3
- Stage 4
- Infill to be fed by existing Curtin Uni Network
- Interface to connect into existing Curtin Network
- Central Energy Plant (CEP)

HEATING AND COOLING DISTRIBUTION STRATEGY

‘Chilled water’ and ‘heating water’ networks currently exist on-site. However, there is limited capacity within this infrastructure to meet projected future demand. With the proposed development, the cooling load is projected to increase from 24.5MW to 98MW; similarly heating will increase for 10.2MW to 45MW. To meet this increase in demand the following network scenarios have been considered:

- Scenario 1 – building by building gas and electricity supply
- Scenario 2 – precinct level central energy plants.

The adoption of Scenario 2 is preferred, with four central energy plants proposed to complement the staged approach of development. Despite the capital costs and potential complexities in engaging tenants, this option will assist in meeting the outcomes of the strategy for future systems and provide the following benefits to the site:

- Security of supply
- Resource efficiency and opportunities to undertake longitudinal educative research
- Better opportunities for demand management including the use of chilled water storage
- Greater efficiency
- Potential for the use of renewables and the delivery of less carbon intensive supplies.

With regards to the locations of the central plant, the master plan is based on the following:

- Plant 1: locate within building 111 (Curtin Stadium) future extension; assume in basement and on roof of building
- Plant 2: new, freestanding building; very high quality architectural treatment, including educational/art component
- Plant 3: new, freestanding building; very high quality architectural treatment, including educational/art component
- Plant 4: extension of building 155; high quality façade treatment.

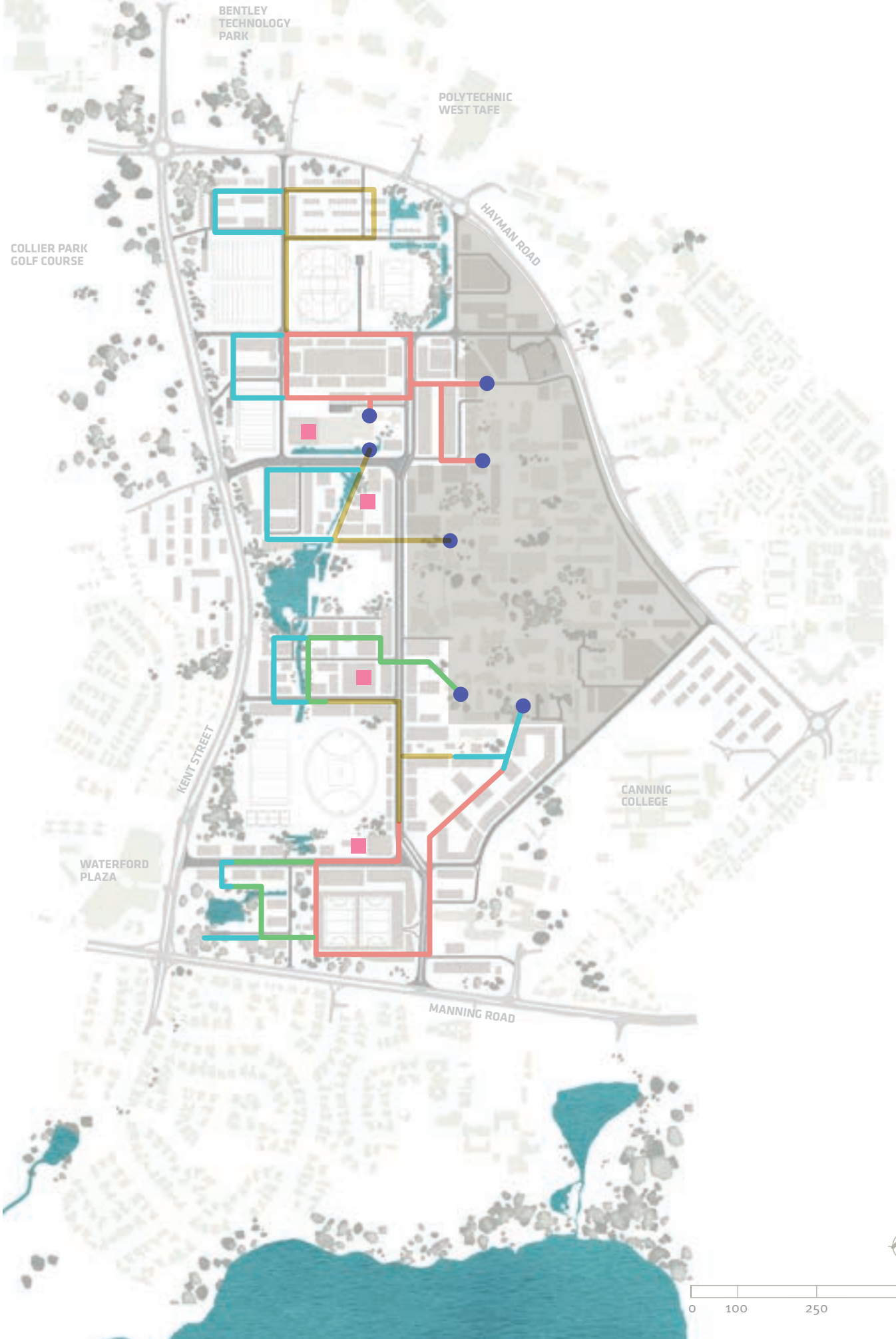
Indicative locations and distribution of main chilled and heating water pipework to supply the proposed site demand have been determined however actual locations will vary due to final detailed staging of the works.

Future Works

A pre-feasibility study is recommended to understand both the technical and economic opportunities and constraints offered by the deployment of centralised chilled water generation. The centralised generation solution can consist of either electric driven chillers or a combination of electric chillers together with trigeneration and associated absorption chillers.



- | | |
|--|--|
| 1 CENTRAL ENERGY PLANT | — HOT WATER |
| 2 COOLING TOWERS | — COLD WATER |
| 3 BOILERS | - - - ELECTRICAL LINE |
| 4 CHILLERS | - - - WATER LINE |
| 5 PLANT ROOM IN BUILDING | - - - GAS LINE |



- Domestic Solar Hot Water Systems on Townhouses
- Other Residential Style Accommodation Suitable for Solar Hot water Systems
- Opportunities for Large PV Systems

RENEWABLE ENERGY STRATEGY

In an urban setting there are limited opportunities for the integration of renewable energy. The following technologies have been identified as those most appropriate for further consideration within this context:

- Solar thermal (including solar hot water)
- Photovoltaics
- Wind
- Geothermal.

Solar thermal

Solar thermal, in the form of solar hot water, could be easily applied to residential accommodation where there is a significant domestic hot water load. With hot water often accounting for 25% of the energy use in a typical household, the townhouse development within the plan would be ideally suited to the installation of domestic size solar hot water systems.

There are also opportunities for larger scale solar hot water systems in apartments and other residential accommodation, where there are large domestic hot water loads (showers, laundries and kitchens). Additionally, solar thermal systems can be utilised as well as part of the central energy plants.

Photovoltaics

Assuming that the large car parks and proposed transport stabling yard are intended to have roof structures installed, this provides a good opportunity for the installation of large-scale photovoltaic (PV) systems due to the typically large unshaded roof spans.

Assuming that conventional PV modules could be installed on at least 50% of the available roof area, and an estimated area of 19,350m² is available across six buildings, there is the potential for systems to be installed that could generate approximately 3,846MWh or 7% of the predicted annual electricity demand for the site. With a total installed capacity of 2.3MWp this would be one of the largest installations in Australia.

There is the potential to install PV on many of the other buildings but this depends on consideration of the following:

- Overshading by adjacent and in particular taller buildings
- The available roof space, particularly in large office/university buildings where roof space is often occupied by mechanical plant
- The capacity of the electrical infrastructure to which the system is being connected
- Other use of space for landscaping as green roofs.

Wind

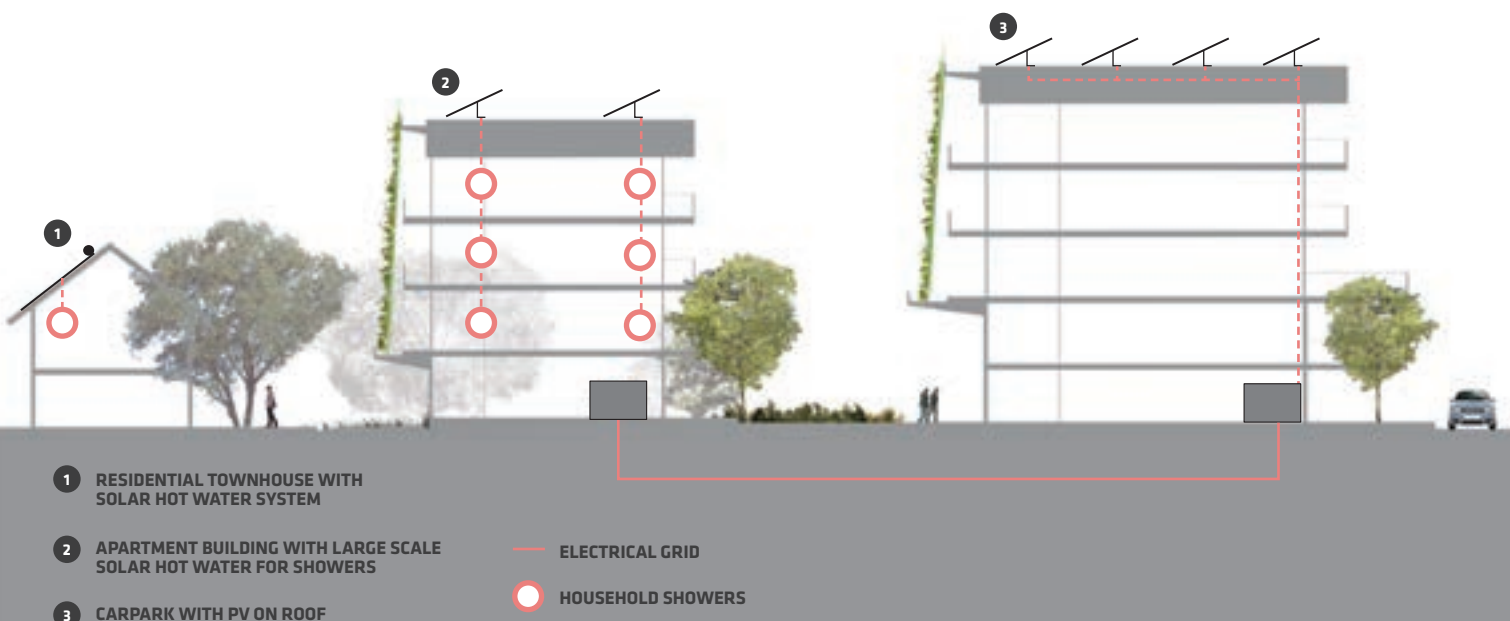
The utilisation of wind energy in the urban context is any area where there has been significant investigation undertaken. The issues faced by this technology in this context relates to the need for constant wind speed and direction to maximise the energy output of turbines. Buildings, trees and other solid elements cause turbulence which can significantly impact wind speed and direction and result in interruptions to the output of energy from the turbines. It is understood that the Green Electric Energy Park (GEEP) includes wind turbines and as such the GEEP provides an opportunity for the university to test the effectiveness of wind turbines in the urban environment.

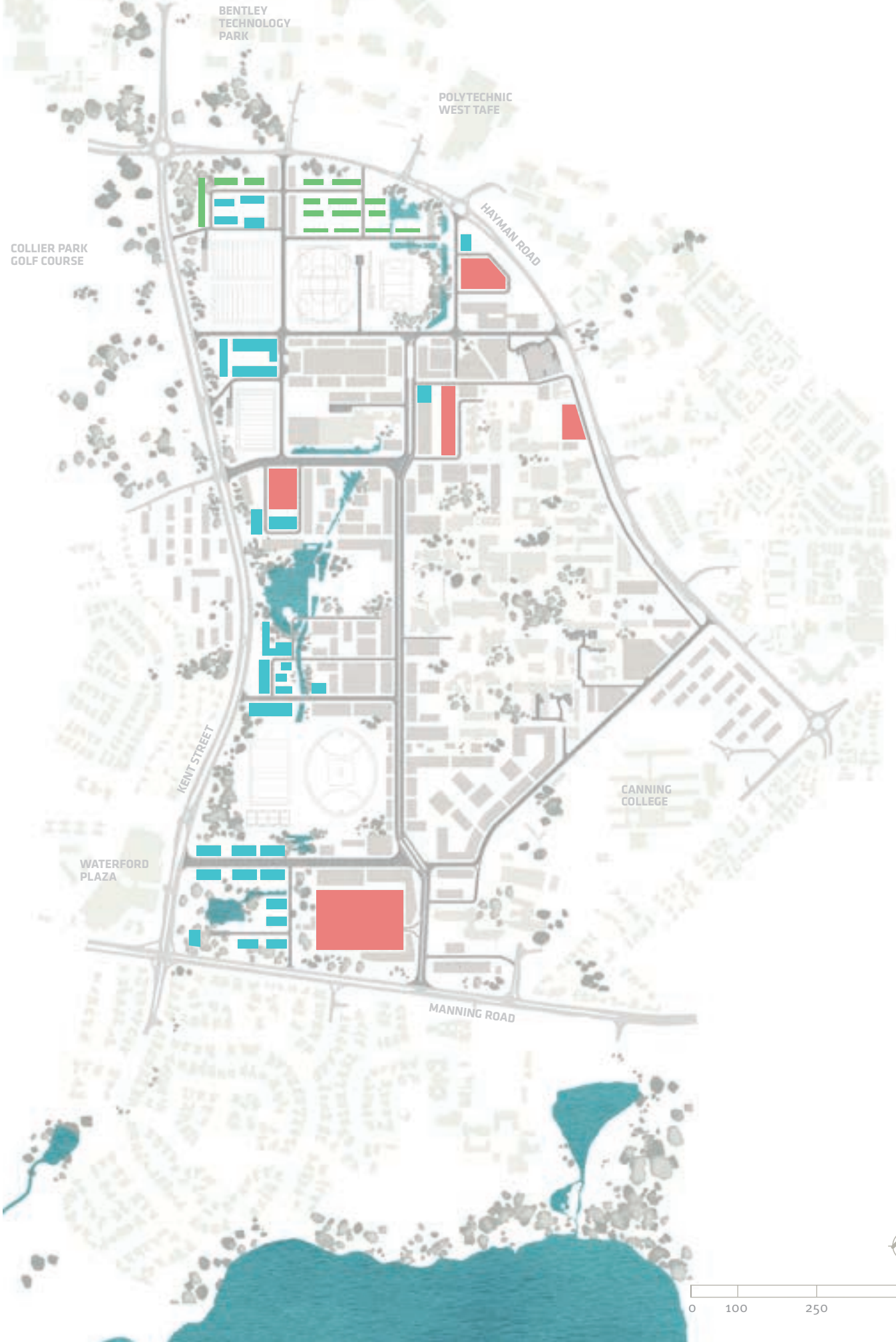
Geothermal

A geothermal system coupled with absorption chillers is a potential option to reduce the energy use associated with the cooling load of buildings. A 2MW system based on two boreholes located approximately 3km below ground has been investigated. In addition to providing chilled water it also has the potential to reduce greenhouse gas emissions by about 2% per year and may be eligible for government funding.

Future Works

The above recommendations are made independent to the central energy plant technology and therefore a feasibility study based on the design of the central energy plant would inform the actual available capacities for integration and use.





WATER

Greater Curtin values water as a key resource, as a focal point and a spatial connector across the site.

The master plan includes an Integrated Urban Water Management (IUWM) strategy that seeks to minimise overall water demand, minimise pressure on groundwater and scheme water supply, harvest rainwater and maximise opportunities for water recycling.

The strategy is grounded in four overarching objectives:

- Increase the efficiency and effectiveness of water use across all aspects of Greater Curtin's development and operation
 - Minimise water consumption through demand management, reducing total water use through the use of appropriate water efficient technologies, appliances and processes
 - Adopt a 'fit for purpose' approach, utilising the appropriate quality of water for intended use
 - Monitor and track water use to assist in optimising efficiency and effectiveness
 - Invest in new and existing infrastructure, providing opportunities for integration of new technologies as and when they become available.
- Implement a holistic approach to managing the water cycle in the context of future infrastructure systems and regional connectivity
 - Celebrate and work with the historic water bodies and flows present on site
 - Recognise the limitations and sensitivities of groundwater supply and the water that is available within it
 - Connect and integrate with Greater Curtin's broader context, including the Canning River and nearby Wetlands located at Clontarf and Collier Golf Course
 - Consider the water cycle as part of a natural ecosystem cycle including energy, waste, nutrients and biodiversity.
- Adopt a self-sufficient approach to managing water in Greater Curtin
 - Minimise the importing/exporting of water into Greater Curtin
 - Maximise opportunities for water recycling and reuse, consider wastewater as a valuable resource
 - Capture and treat rainwater for appropriate uses.
- Promote and integrate water education in all aspects of city life
 - Deliver solutions that translate the water cycle in terms of water capture, treatment, public realm design and use throughout Greater Curtin
 - Exploit opportunities to educate students, residents and visitors about Integrated Water Management in an active and participatory way.

The proposed strategy includes:

- A demand management strategy
- A rainwater reuse and recycling strategy
- A wastewater reuse and recycling strategy
- A stormwater management strategy
- An irrigation strategy.

For more information, refer to the Greater Curtin Integrated Urban Water Management Strategy technical report.



- Rainwater Collection Buildings
- Indicative collection pipework to centralised rainwater tanks
- Indicative location of underground centralised rainwater tanks

RAINWATER REUSE AND RECYCLING STRATEGY

The master plan delivers a rainwater reuse and recycling strategy that harvests and stores rainwater to supplement the scheme supply and offset potable indoor demand.

The strategy proposes the collection of clean rainwater run-off from the roofs of all new buildings without roof gardens (approximately 75% of buildings proposed) for distribution to neighbourhood-based underground centralised rainwater storage tanks. Water leaving the tanks will be appropriately treated and then integrated with the main scheme water supply for potable use in buildings. Flows over and above the capacity of the tanks at any point will bypass directly into the Living Stream via the swale network.

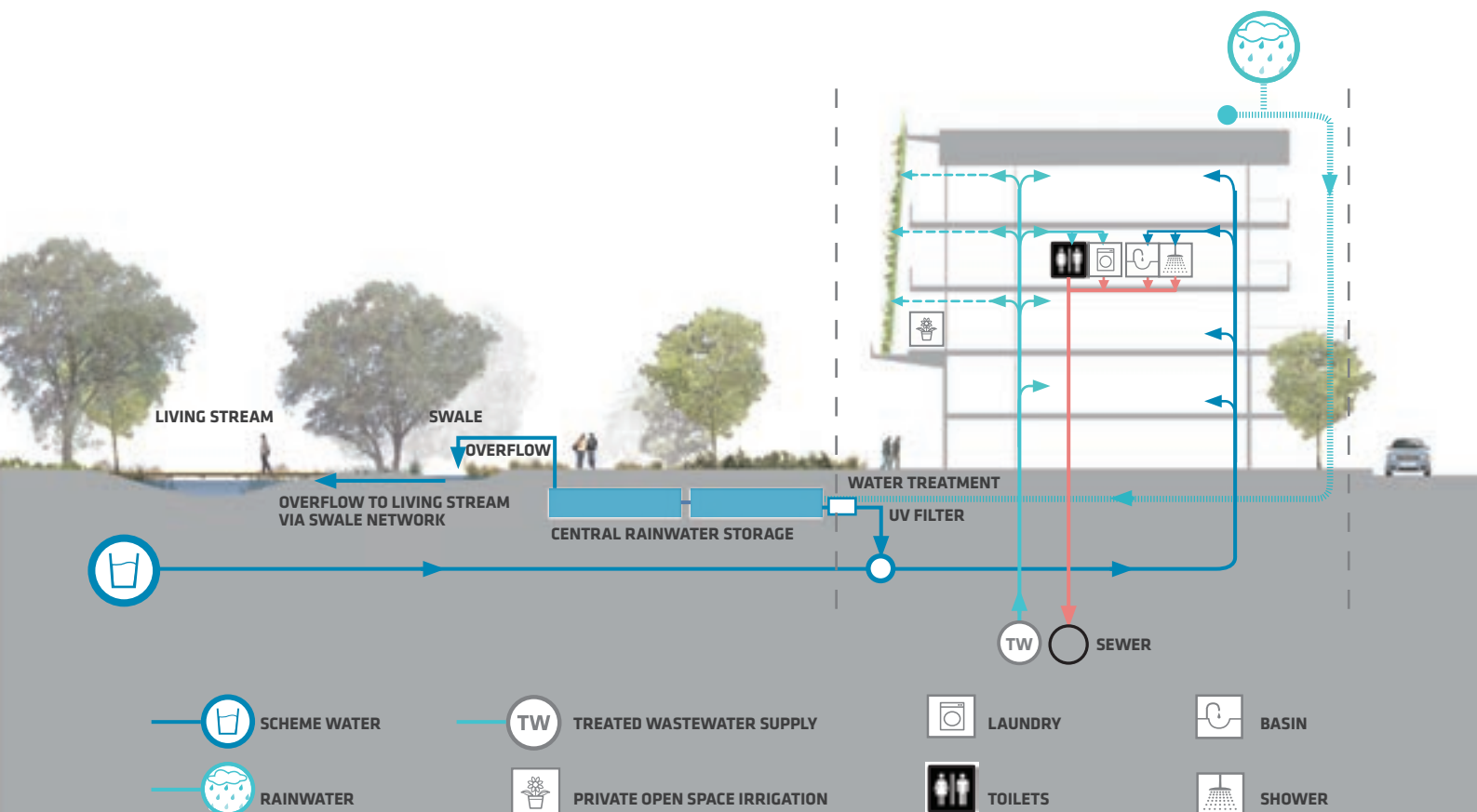
The underground rainwater storage systems will not require additional space on ground level; they will be positioned under the streets and pedestrian networks within each neighbourhood.

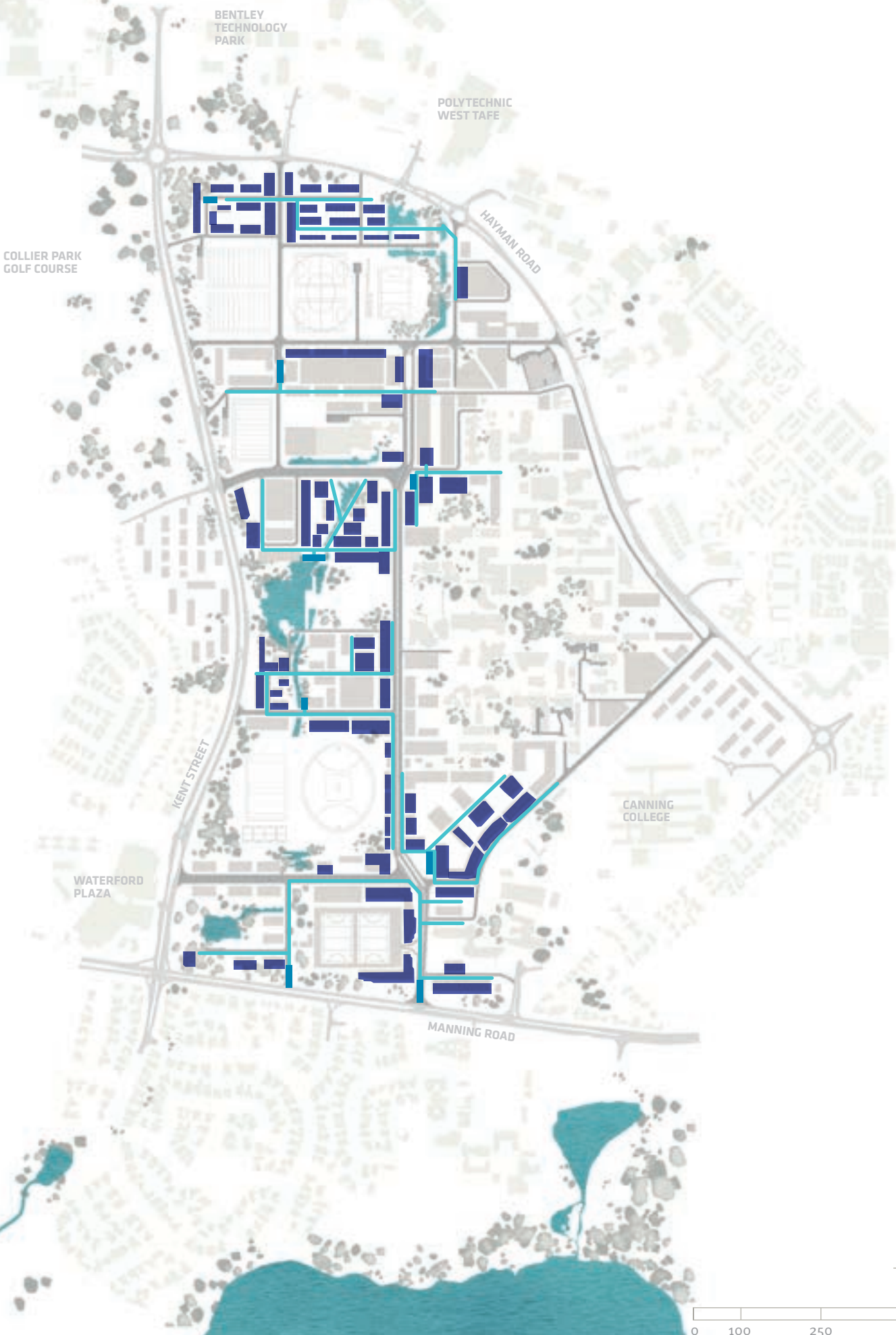
Benefits

The harvested rainwater will make a substantial contribution to the overall scheme water dependency, potentially supplying approximately 27% of the potable water demand, which equates to 91 megalitres of water annually. The actual offset will depend on optimising storages in terms of overall capital cost.

Additional benefits include:

- Fit for purpose water use
- Reduction in volumes and frequency of stormwater discharge
- Reduction in groundwater abstraction volumes
- Diversification of Greater Curtin water ‘portfolio’ and contribution to the security of the water supply.





BENTLEY
TECHNOLOGY
PARK

POLYTECHNIC
WEST TAFE

COLLIER PARK
GOLF COURSE

HAYMAN ROAD

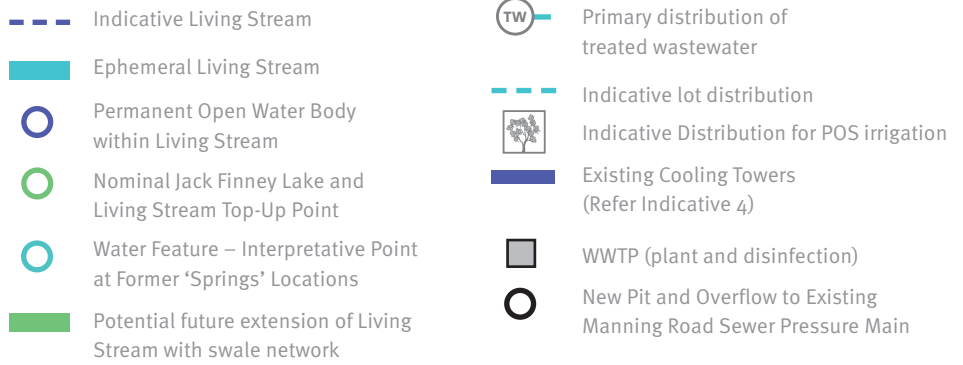
KENT STREET

CANNING
COLLEGE

WATERFORD
PLAZA

MANNING ROAD





WASTEWATER REUSE AND RECYCLING STRATEGY

The master plan includes a wastewater reuse strategy that is based on the treatment of wastewater from Greater Curtin and off-site catchment to the highest quality standard, and reuse of treated effluent for irrigation and non-potable indoor uses.

The strategy proposes the decentralised wastewater treatment in an advanced membrane bioreactor plant (MBR), to be located in the southern part of the development. Treated effluent will be recycled throughout the development via a third pipe reuse network and will be the main supplementary water source used for the following purposes:

- Internal non-potable demand including toilet flushing, cold water laundry and cooling towers water demand
- Irrigation of public open spaces and sporting fields
- Irrigation of on-lot landscape
- Living Stream top-up
- Jack Finney Lake top-up.

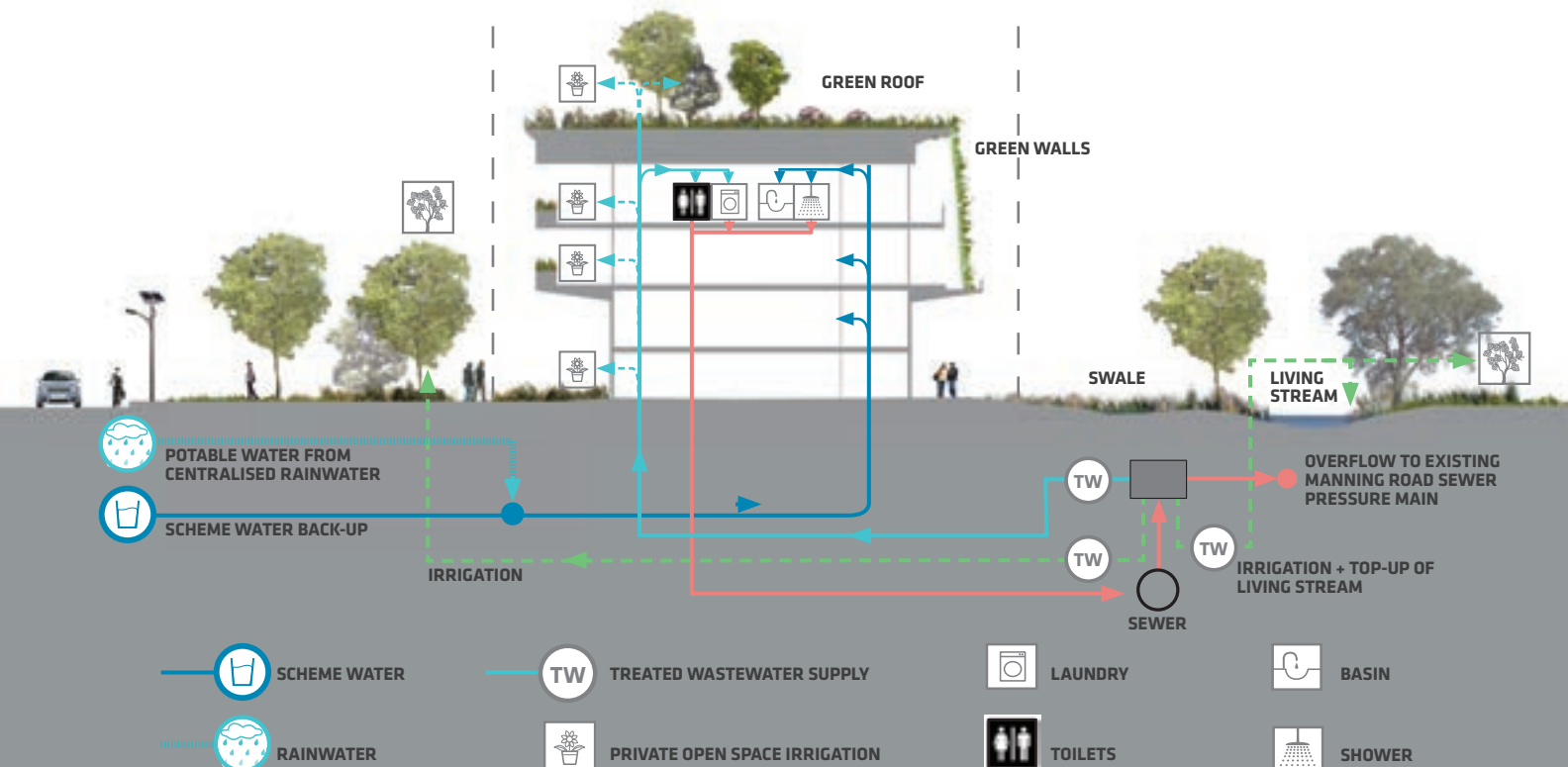
Benefits

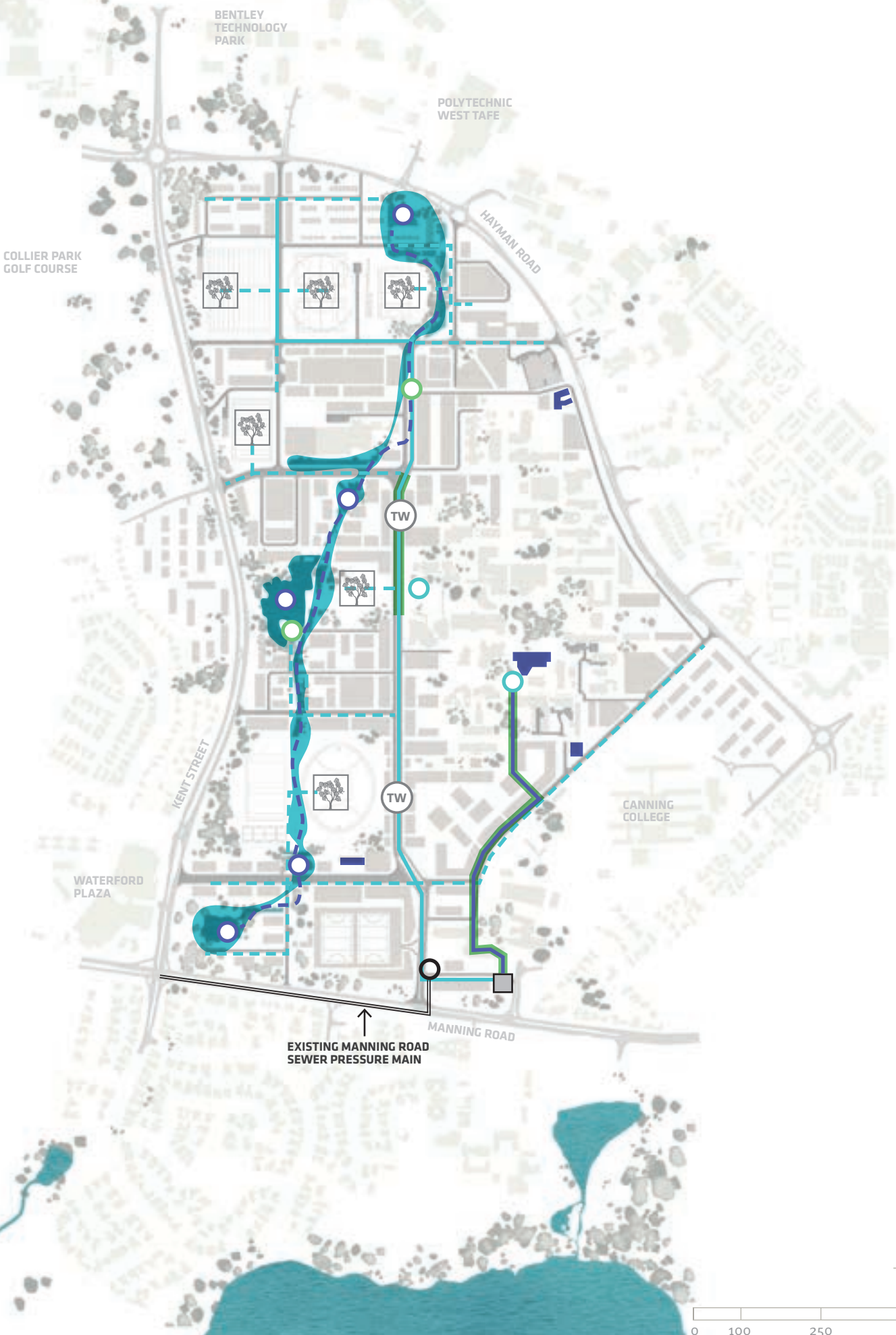
The Water Corporation has confirmed that the existing capacity of the Kent Street sewer is insufficient to handle the ultimate demand of Greater Curtin, assuming a business as usual approach to conveying sewage. They have advised that additional sewage generated by Greater Curtin will require upgrades to the existing sewer network, a new pump station and a new connection to the Manning Road main sewer.

The wastewater treatment plant and recycling initiatives will reduce the volumes of sewage requiring off-site conveyance, enabling the offset of some of the required upgrades. The reuse of treated wastewater will offset total scheme water demand by 50% (or 535 ML per annum) and indoor non-potable water demand by 71%.

Some of the key additional benefits of wastewater recycling are:

- Reduction in scheme water use for irrigation by 68% (187 ML/year)
- Reductions in pressure on groundwater resources
- Zero wastewater discharge
- Self-sufficient approach to water management, fit for purpose water use and diversification of water supply.





- Indicative Living Stream
- ||||| Swale Network
- Overflow from Green Roofs to Swale Network
- Overflow from Rainwater Tank to Swale Network
- Proposed Connection Point to Existing Stormwater Network
- Creation of Spring Interpretation Point Overflow to Swale Network

STORMWATER MANAGEMENT STRATEGY

The master plan delivers a stormwater management strategy that includes the treatment and conveyance of stormwater via a swale and Living Stream network to offset on-lot storage and treatment supplying the core landscape features throughout Greater Curtin.

The strategy proposes replacing conventional stormwater drainage infrastructure (and compensating basins within the development) with an open green network consisting of a vegetated Living Stream and swale network that provides storage, conveyance, water treatment and reuse functions. The Water Corporation have advised that Greater Curtin must not discharge any additional stormwater into the off-site stormwater network, but rather manage stormwater on-site. The neighbourhood-based swale and Living Stream network will remove the need for lot-based stormwater storage since all run-off will connect to swales within the street and public open space network. This network is intended to manage the 10-year ARI event as required by the Water Corporation.

Within the highly urbanised Main Street section, the character of the Living Stream will be more urban, like an ‘aquaduct’ type feature, facilitating public interaction with the water providing opportunities for wading, sitting etc.

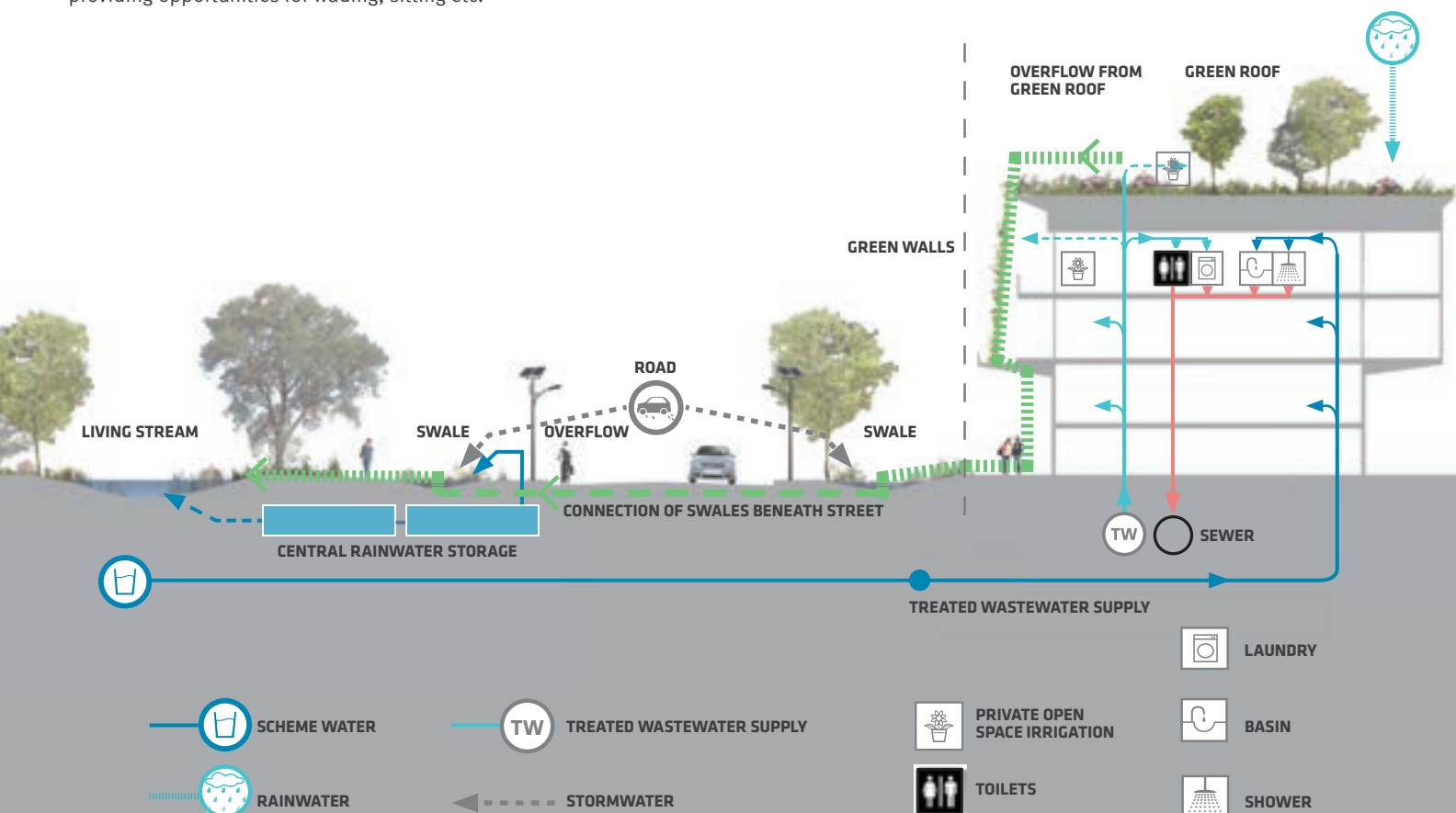
Benefits

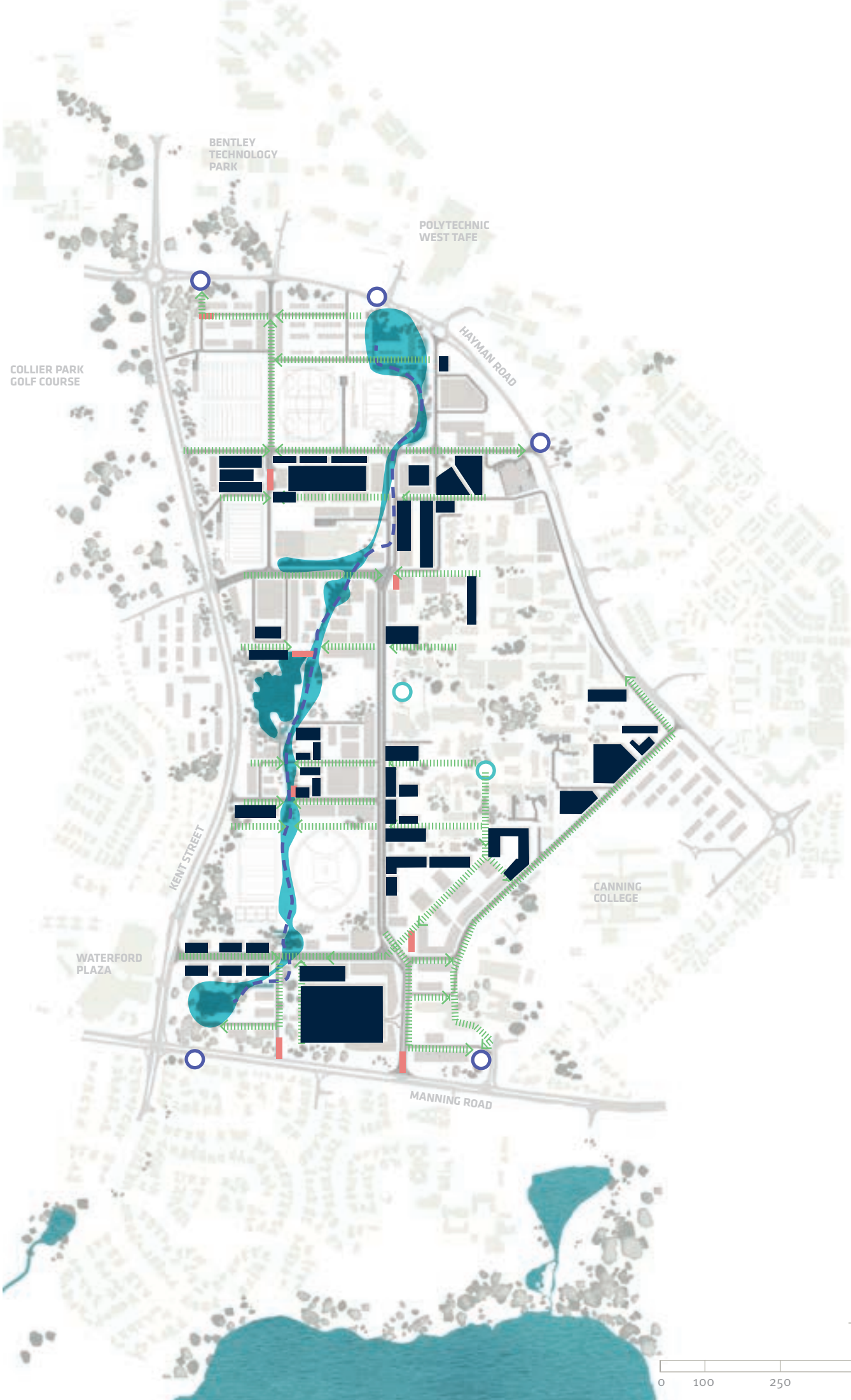
The proposed Living Stream provides the additional storage required to manage a 1:10 year event within Greater Curtin, without the need for additional compensating basins, making more land available for development or public open space. It offsets the need for basin infrastructure upgrades and lot-based stormwater management infrastructure under a conventional development scenario.

Additionally, the physical interpretation of the Living Stream, as a key feature of Greater Curtin’s natural landscape provides opportunities to influence the creation of varied landscape characters within a network, and offer educational and Indigenous cultural interpretation.

It also provides a biodiversity corridor and enables creation of diverse habitats and ecosystems that can support a wide range of plants and animals.

As a Green Infrastructure spine, the Living Stream enables connection and interaction of water bodies and landscapes within Greater Curtin and with the broader area.





BENTLEY
TECHNOLOGY
PARK

POLYTECHNIC
WEST TAFE

COLLIER PARK
GOLF COURSE

HAYMAN ROAD







KENT STREET

CANNING
COLLEGE

WATERFORD
PLAZA

MANNING ROAD



-  Existing Pinus pinasta to be retained and replanted
-  Existing Pinus pinasta not to be replanted
-  Proposed new stands of Pinus pinasta
-  Existing trees to remain including vegetation outside site boundary linking to regionally significant biodiversity areas
-  Roof Gardens
-  Biodiversity Links

ROOF GARDEN STRATEGY

The master plan proposes vegetated roof top gardens along the biodiversity/POS corridors.

The strategy proposes installation of roof gardens on ~25% of the total building area within each precinct. As a priority roof gardens will be installed on new academic, transport and civic buildings that are located within the biodiversity/POS corridors in each precinct. Gardens will be vegetated with locally native plants.

Roof top gardens are part of a comprehensive bio-network as shown on the opposite page.

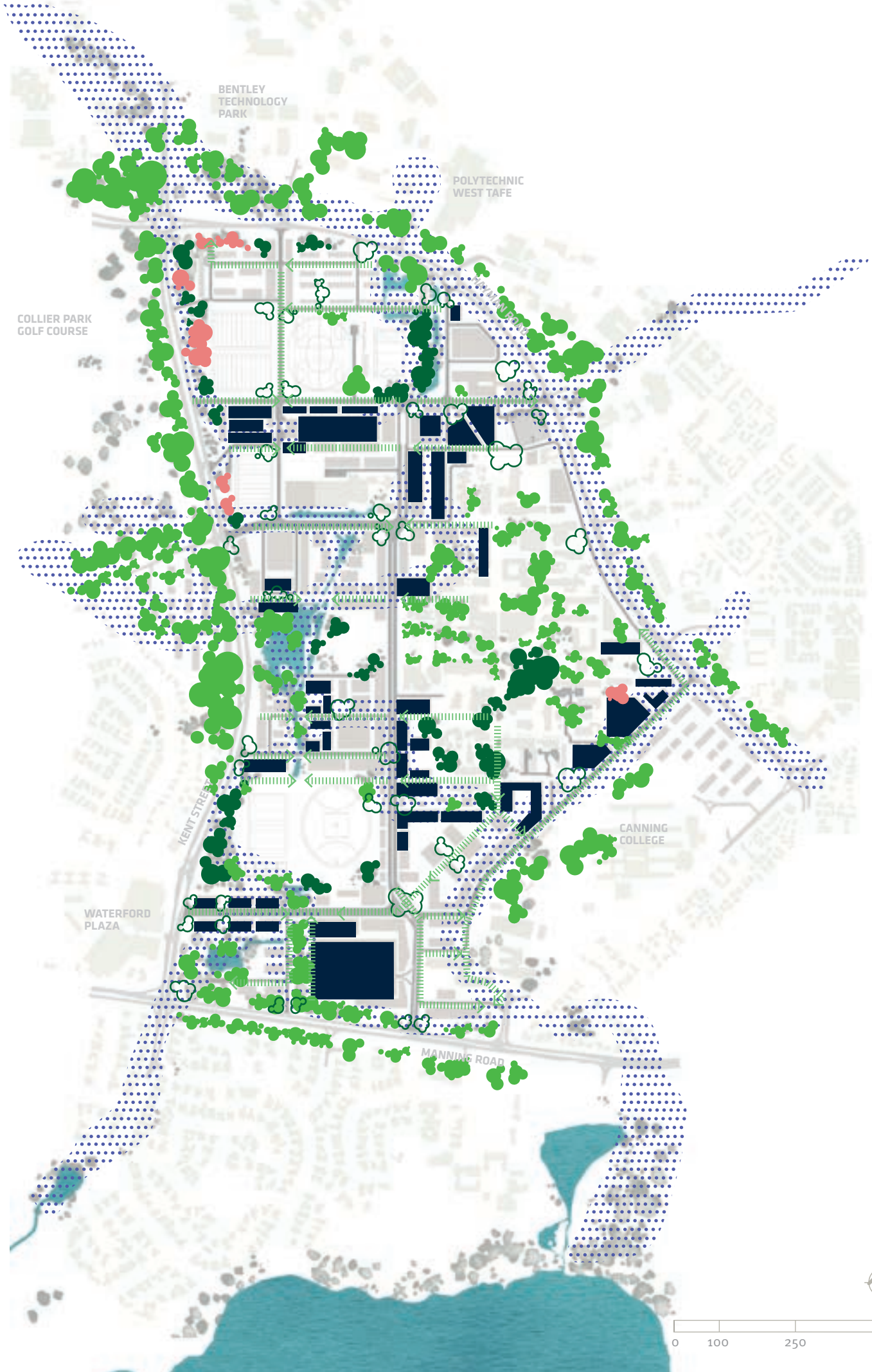
Benefits

The proposed roof garden strategy:

- Dampen peak velocity and runoff volumes during storm events
- Improvement of the building's thermal property
- Reduction in energy demand on space conditioning (heating/cooling)
- Extension of the life span of roofing membranes through reduction in the exposure of surfaces to UV radiation, temperature fluctuations and physical damage that cause the breakdown of material
- Improvement of air quality
- Reduction of the urban island heat effect
- Potentially provides habitat for Carnaby's Black Cockatoos and other avian fauna
- Contribution to biodiversity connectivity and private open space provision in development
- Provision of the 'third dimension' to a biodiversity link
- Demonstration and measurement of roof garden performance in water management, thermal performance and biodiversity within university teaching and research programs.

Roof top gardens and biodiversity linkages:

- Revegetate and enhance areas to achieve a continuous biodiversity corridor
- Restore indigenous understorey and overstorey to support Carnaby's Black Cockatoo and other fauna
- Existing indigenous and native trees or remnant bushland to be retained and enhanced with biodiversity corridors
- Enhance existing waterbodies and recover/restore historic wetlands as water features or habitat
- Where built form intersects, respond either with roof garden/ green façade or setback building and cantilever into corridor.



BENTLEY
TECHNOLOGY
PARK

POLYTECHNIC
WEST TAFE

COLLIER PARK
GOLF COURSE

WATERFORD
PLAZA

CANNING
COLLEGE

KENT STREET

MANNINGS ROAD



4.5 LAND USE SPATIAL PLANNING ASSESSMENT

INTRODUCTION

The Greater Curtin sustainability assessment has been prepared to document and inform the development of the final master plan. The framework ensured that the universities priorities, site context, stakeholder inputs and sustainability priorities were considered and adopted to inform the critical analysis.

PROCESS

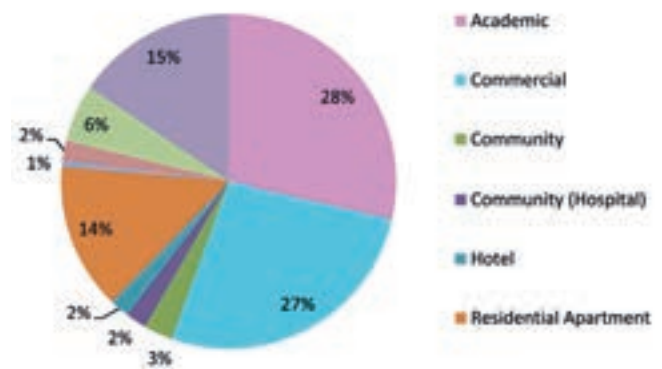
The team, including the university and stakeholder group, established a set of design principles to guide the development and assessment of the master plan process. A range of master plan options were developed as a result of design workshops, constraints analysis, stakeholder and consultant inputs. Two options were then refined to test a range of different design, land use, density, transport and infrastructure outcomes. As part of the design development process the team sought to generate an evidence-based critique to assist in determining final design direction, to ensure the design principles were addressed.

The approach taken has utilised a range of quantitative and qualitative indicators that respond to holistic considerations. The quantitative analysis tool applied the AECOM Sustainable Systems Integration Model (SSIM), a unique, integrated Geographic Information Systems (GIS)-based land use spatial planning tool.

The tool assists in optimising the sustainability outcomes of the final master plan by quantifying environmental, social and cost performance indicators to demonstrate their validity.

GREATER CURTIN SUSTAINABILITY ASSESSMENT

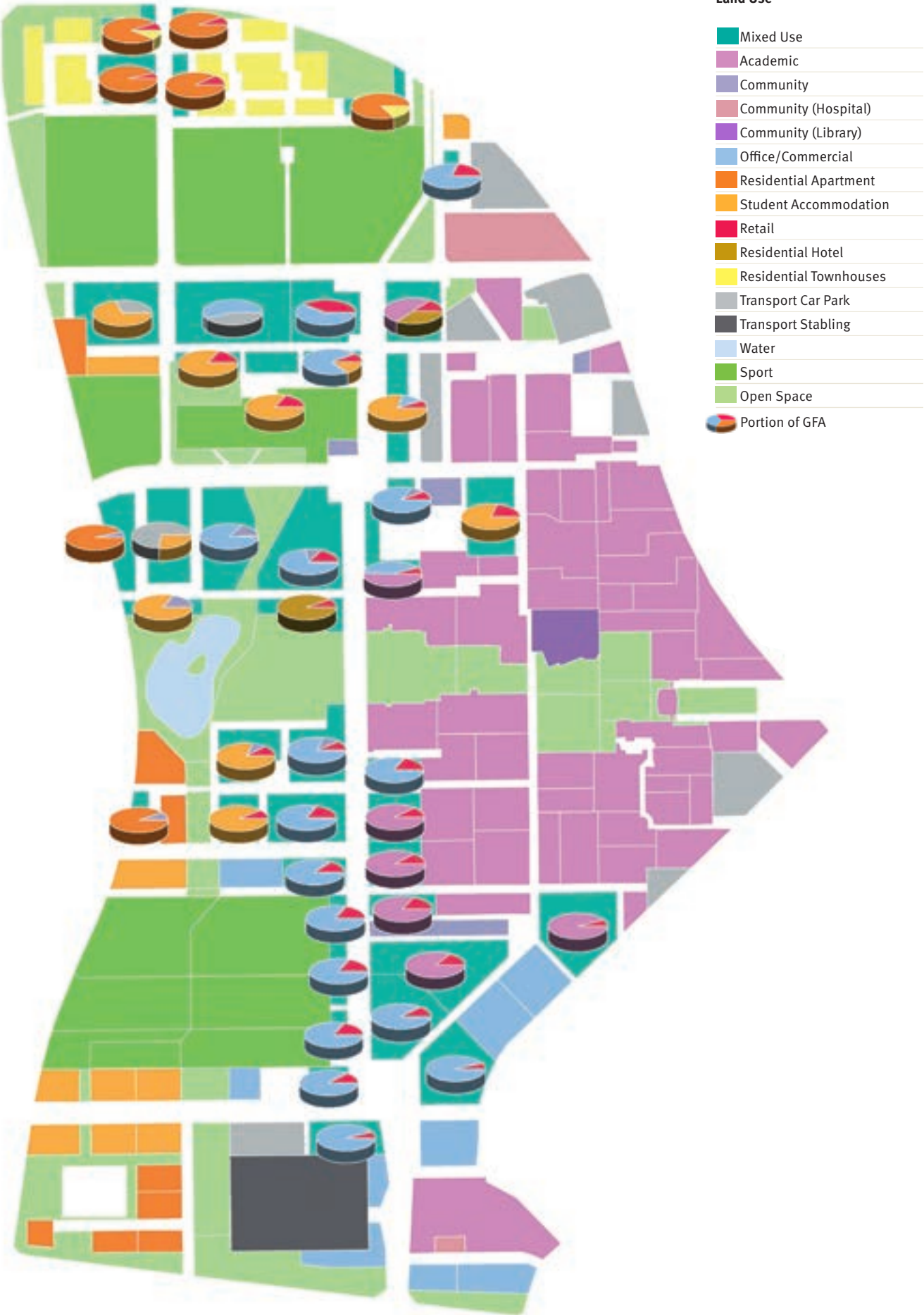
The sustainability assessment ran the final plan through a number of indicators to demonstrate the progress of the master plan. It identified benchmarks for future planning and provides a basis for future land use design considerations. The pie chart opposite shows the proportional breakdown of the floor areas within the master plan and the adjacent plan identifies the land use mix with the dominant land use, and the alternative uses identified in proportional pie charts.



Portion of Total Floor Area

Land Uses	GFA	m ²
Academic	296,262	257,619
Student Residential	57,714	131,184
Tech park (Commercial)	123,900	206,500
Civic or Cultural	8,975	22,439
Health	28,314	28,314
Hotel	11,393	7,595
Office	171,855	42,964
Residential	67,809	113,015
Retail	54,600	68,250

The anticipated land use distribution and GFA was used to assist in generating access, consumption and emission rates for the master plan. The indicators tested through the final run considered energy, water, greenhouse gas, student resident accessibility, and employee accessibility performance. The total forecasted results from this assessment are provided in the following table and spatial mapping plans.



Residential and Employment Population

- Higher Residential Intensity
- Lower Residential Intensity
- Higher Employment Intensity
- Lower Employment Intensity



Residential and Employment Population

The maps above show the distribution of residential and employment populations. The height represents the total populations and the colour range shows intensity per m² of GFA.

ACCESSIBILITY

Accessibility maps consider the linear walking distance along roads or shared paths. The maps colour scales consider a range of factors including population density, land use and the number of facilities within the specified distance of the facility. The population is only counted once in the maps to identify areas of over concentration or design inefficiencies.

The population for the purposes of the analysis were generated based on existing campus benchmarks for number of students and employees per m² of GFA. Other benchmarks drew from the work by CBRE and Praxis in forecasting demand and supply as well as other residential standards.

Retail Accessibility

Each option was modelled in terms of the proportion of the student and commercial population within a 5 minute walk (500m) of a retail land use.

Public Transport Accessibility

This indicator is focussed on the level of accessibility of the community to the transport network and determines the proportion of employment population within a 5-6 minute walk (500m distance) of a public transport stop.

Student Facility Accessibility

This indicator is focussed on the level of accessibility of the student residential accommodation to the academic land uses within a 5-6 minute walk (500m distance).

The outcomes from the assessment identified active transport infrastructure and public amenity, wayfinding, signage and lighting considerations to further improve accessibility.

POPULATION

The height of the graphs shown in the maps adjacent represent the total populations. The colour range shows intensity per m² of GFA.



Student Population

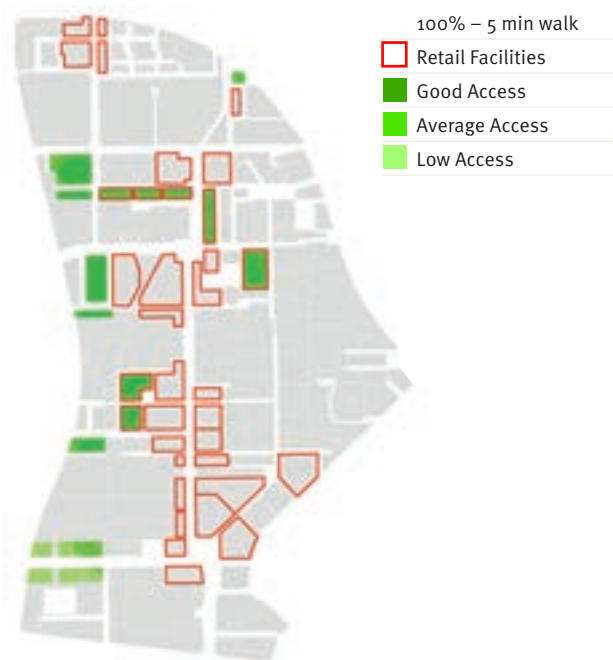
- Higher Intensity
- Lower Intensity



Student Population

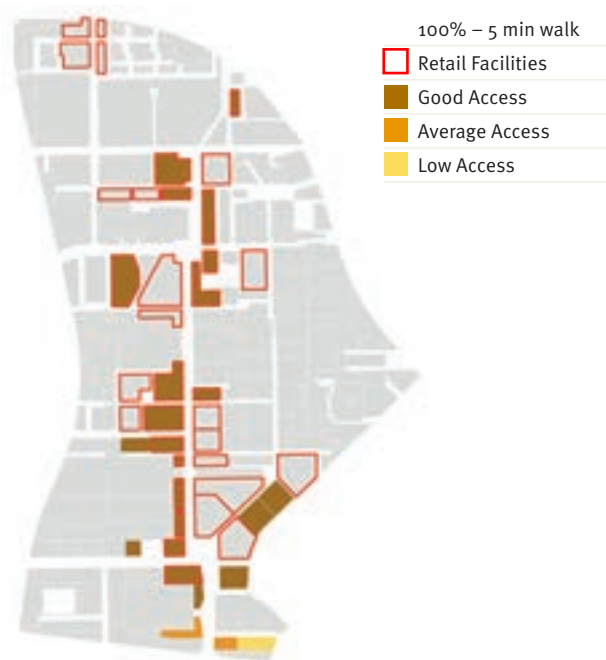
The maps above show the distribution of the total student population. The height represents total population within the parcel and the colour range shows the intensity per m² of GFA.

Student Accommodation to Retail Facilities



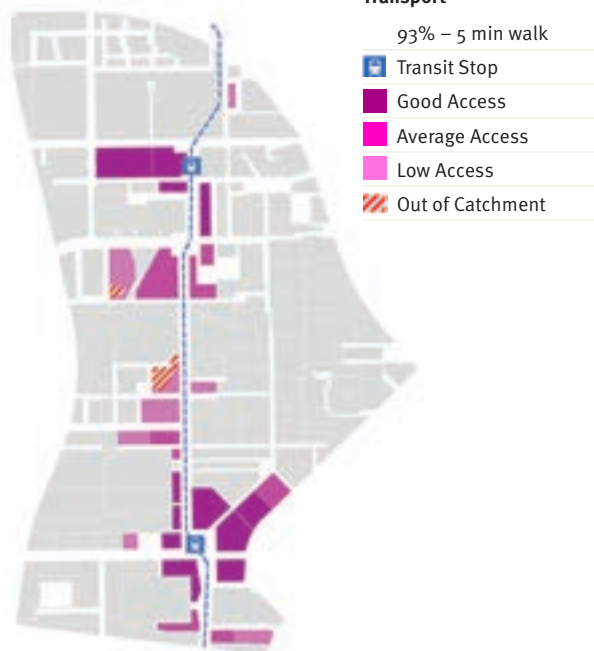
Student Accommodation Access to Retail
The map above indicates that 100% of student accommodation residents are located within a 5 minute walk of retail facilities.

Commercial Office to Retail Facilities



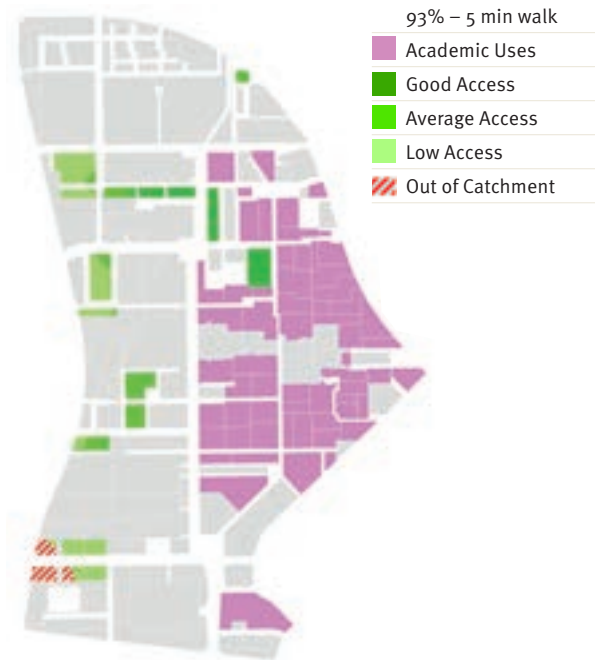
Commercial office Access to Retail
The map above indicates that 100% of the commercial office workers are located within a 5 minute walk of retail facilities.

Commercial Office Workers to Public Transport



Public Transport Accessibility
The above map indicates that 93% of commercial office workers are located within a 5 minute walk of public transport.

Student Accommodation to Academic Uses

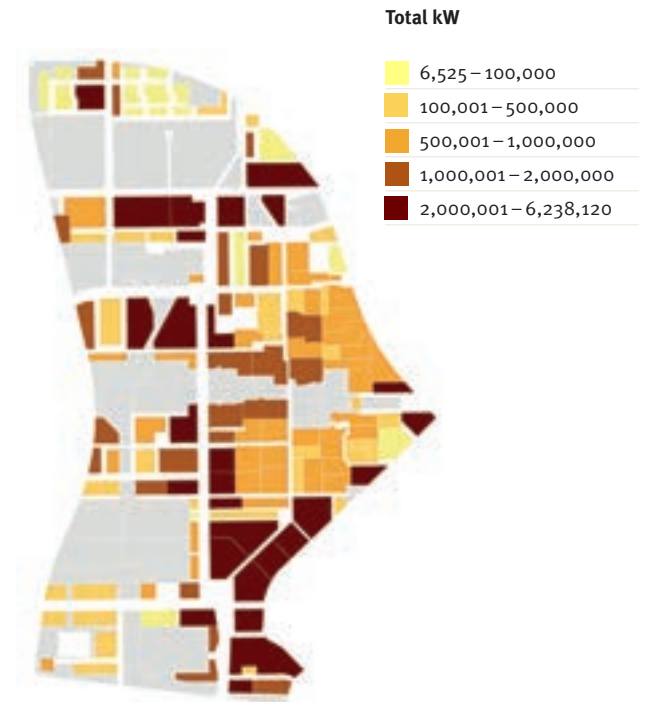


Student Facility Accessibility
The above map indicates that 93% of student accommodation residents are located within a 5 minute walk of academic uses.

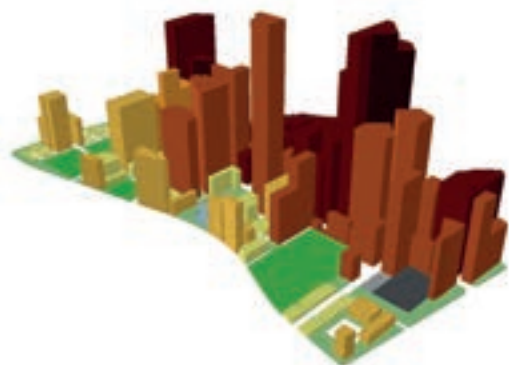
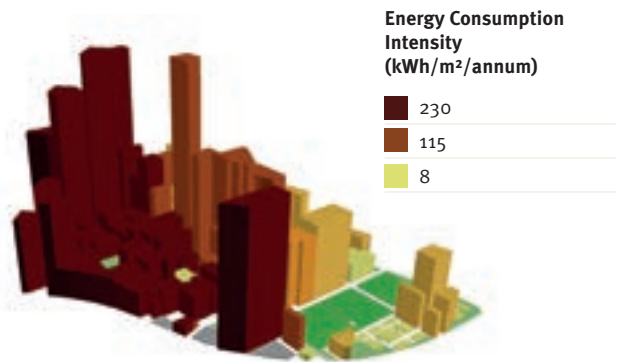
ENERGY

The energy model completed for the study area has considered total energy demand. This includes the forecast amount of gas and electricity used within the study area over the year. Energy demand is represented in energy use per hour or kilowatt hours (kWh). It is based on benchmarked rates of annual consumption of electricity and gas over a one-year period. These rates of consumption have been measured in megawatt hours (mWh), or 1,000 x 1 kWh.

These are based on a range of inputs used including the existing consumption rates, NABERS energy rating tool, previous studies and data provided for the existing university. The outcomes from the assessment identified a range of options including building orientation, floor space efficiency, flexible working arrangements and infrastructure considerations to improve efficiencies in energy use and reduce peak demand.



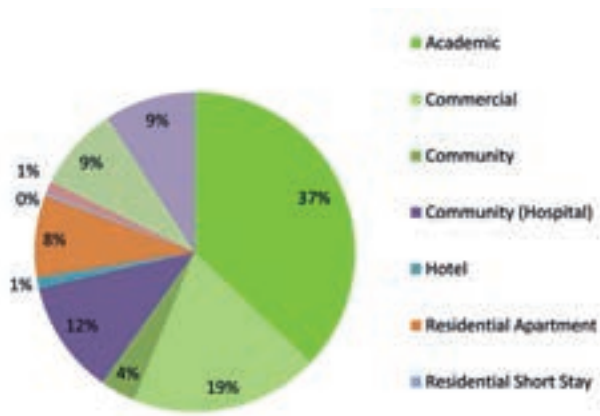
Energy Consumption



Energy Consumption Maps

The maps above show the distribution of energy consumption. The height represents the total consumption and the colour range shows intensity per m² of GFA.

Land Uses	Energy (mWh/y) (1mWh = 1,000 x 1kWh)		
	Gas	Electricity	Energy Total
Academic	20,154	48,311	68,465
Community	1,957	3,223	5,179
Community (Hospital)	1,495	3,138	4,633
Library	323	773	1,096
Commercial	16,232	31,345	47,577
Residential Apartment	802	10,932	11,734
Residential Townhouse	109	420	529
Retail	811	5,446	6,257
Hotel	109	424	533
Residential Short Stay	35	136	171
Student Accommodation	887	3,436	4,323
Car Park	0	170	170
TOTALS:	42,914	107,753	150,666

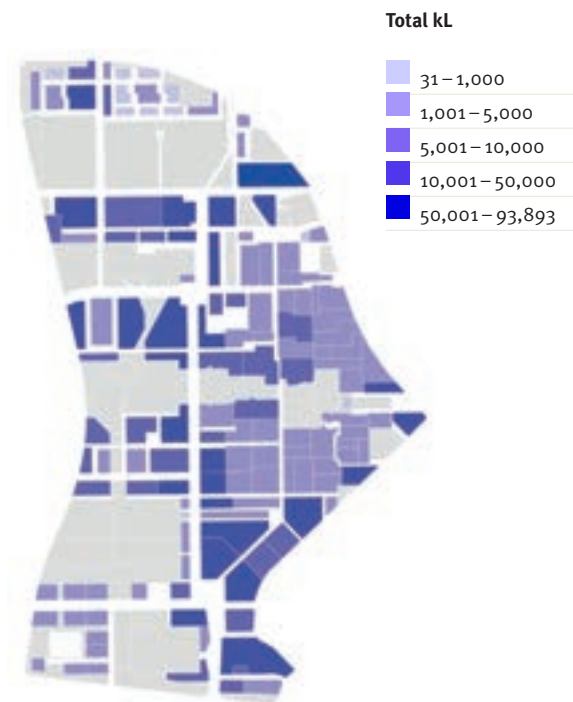


WATER

The focus of this assessment is on the operational water consumption from the master plan options and land uses proposed. The assessment references WA average water consumption data as well as NABERS water consumption rates, and considers different water consumption rates for different building types, lot sizes and occupancy ratios for different uses proposed. The water consumption rates are calculated from typical annual consumption rates per square metre of floor area.

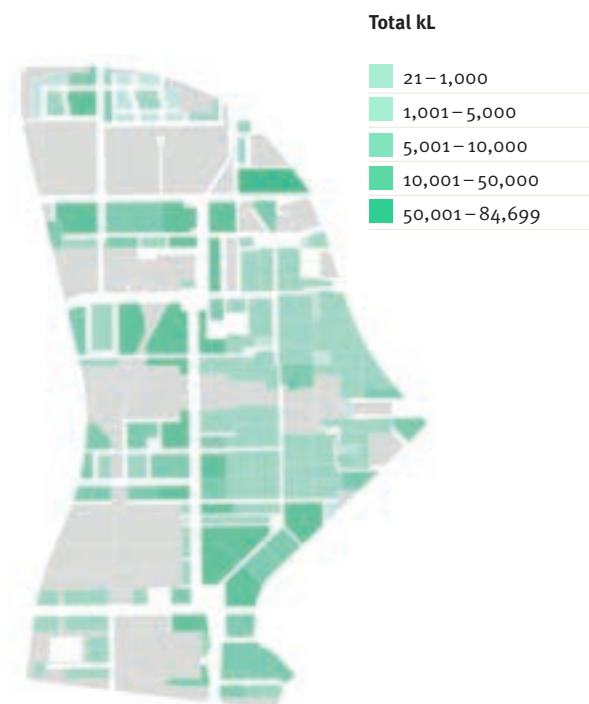
The following maps illustrate the total water consumption for the parcels in the study area measured in kilolitres (kL) per metre square of site area. The outcomes from the assessment identified demand management measures together with rainwater harvesting and storage, whole wastewater (blackwater and greywater) treatment and recycling to improve efficiencies, as well as reduce water demand and wastewater generated.

This does not include the estimated 445ML per year of external demand for irrigation noted in the Integrated Urban Water Management Strategy. For further information on the final water design resolution refer to the Greater Curtin Integrated Water Management Strategy technical report.



Scheme Water Consumption

Land Uses	Water (ML/y)	
	Scheme Water	Waste Water
Academic	326	219
Community	32	21
Community (Hospital)	101	91
Library	5	5
Commercial	168	162
Residential Apartment	73	66
Residential Townhouse	10	8
Retail	75	72
Hotel	10	9
Residential Short Stay	3	3
Student Accommodation	81	73
Car Park	0	0
TOTALS:	884	729

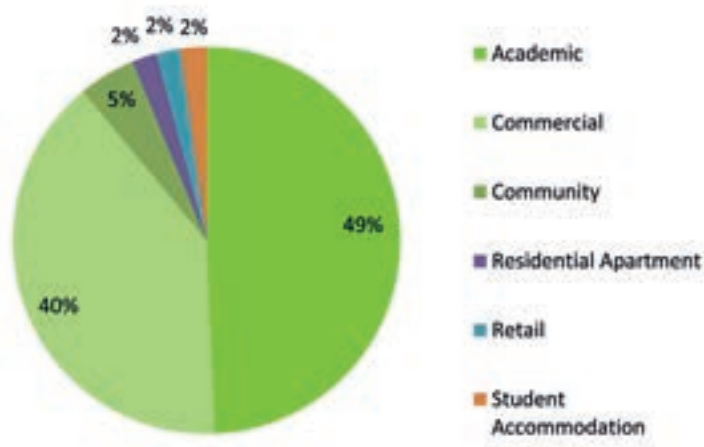


Waste Water Generation

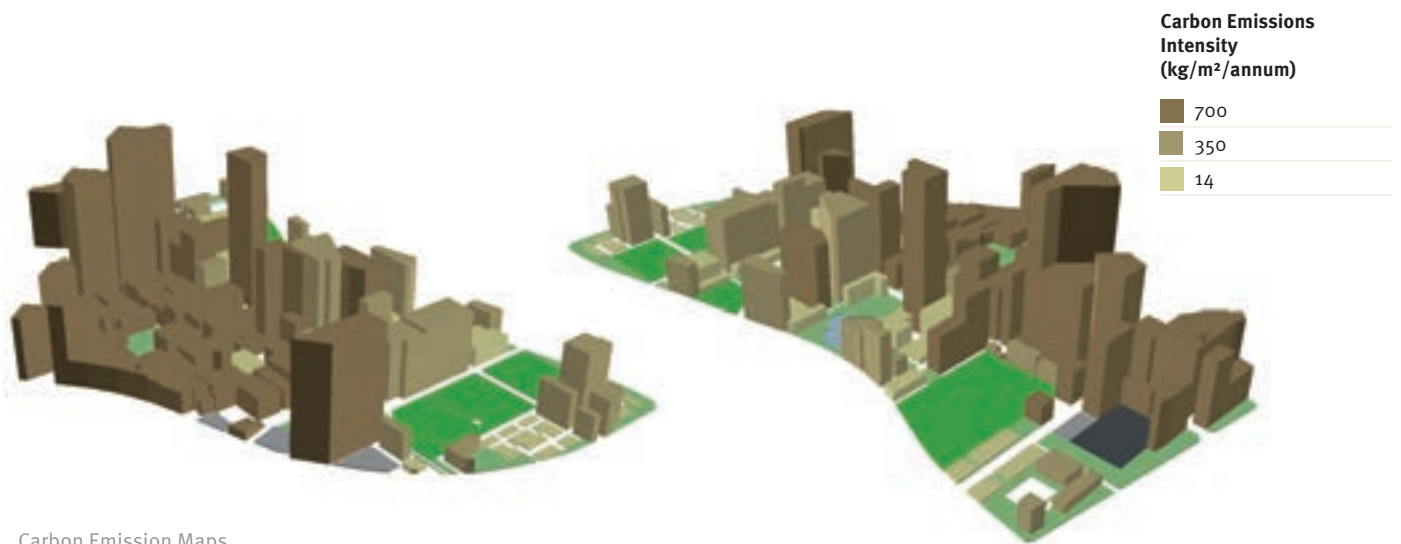
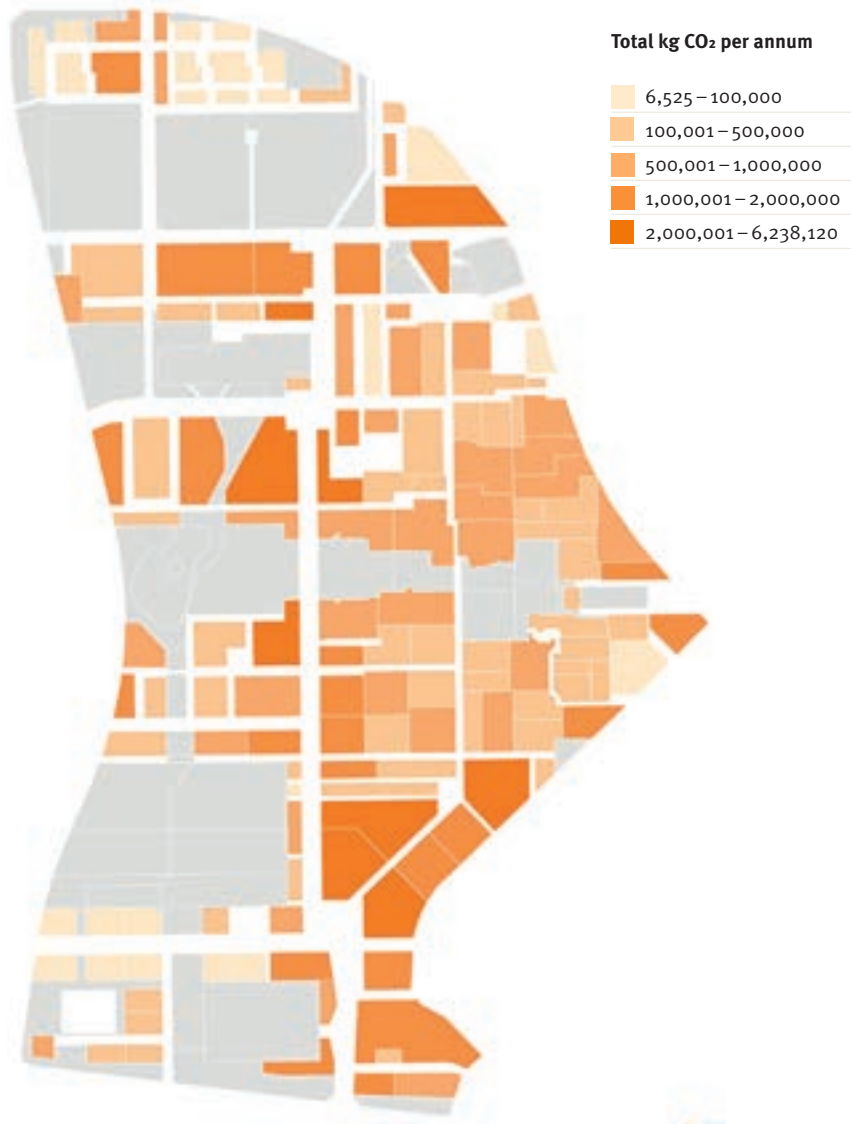
GREENHOUSE GAS

This assessment considers operational greenhouse gas emissions associated with energy supplied to the community. The assessment takes into account land use, residential density, average GFA, energy consumption, and the greenhouse gas intensities associated with energy production. Greenhouse gas emissions are expressed in carbon dioxide equivalents (CO₂-e).

The Australian National Greenhouse Accounts Factors July 2012 were used to determine CO₂-e factors for different energy types. These are modelled based on the electricity and gas consumed within the study area. The following table provides an estimate of the total greenhouse gas emissions from the operational electricity and gas consumption. The outcomes from the assessment identified the use of tri-generation systems, building design, transport and selection of appliances to reduce emissions.












Land Uses	GHG
Land Use	Tons CO ₂ -e/annum
Academic	4,054
Community	392
Community (Hospital)	300
Library	65
Commercial	3,259
Residential Apartment	169
Residential Townhouse	22
Retail	166
Hotel	22
Residential Short Stay	7
Student Accommodation	180
Car park	8,636
TOTALS:	150,666



Carbon Emission Maps

The maps above show carbon emissions. The height represents the total emissions and the colour range shows intensity per m² of GFA.

	Existing Built Form
	Proposed Built Form
	Sports Fields – Grass
	Sports Fields – Artificial
	Water Bodies/Living Stream
	Key Pedestrian Connections
	Pine Stands
	Endemic Australian Vegetation
	Green Roofs

4.6 PUBLIC REALM

INTRODUCING THE PUBLIC REALM

Greater Curtin’s public realm aims to be a highly innovative, memorable and diverse environment.

The proposed public realm will deliver a dynamic and stimulating ecological and educational landscape as well as a comfortable and attractive place where the Greater Curtin community will come together to exchange and express ideas, play and relax.

The term public realm within the master plan relates simply to all areas that are publicly accessible. This definition includes publicly accessible and community areas within development lots.

The public realm strategies are illustrated and defined through:

1. The Illustrative Public Realm Master Plan

This provides an overarching illustration of the ultimate composition and distribution of the public realm within the master plan. In the plan only the key structuring features are labelled. The illustrative plan is supported by an additional two diagrams. These diagrams identify and determine in greater detail the key ‘Areas’ and ‘Places’ within the plan.

2. Public Realm Guiding Principles

These set out the six key areas of focus, rules and requirements for the design of the public realm and have been determined to guide all design considerations, opportunities and outcomes.

3. Public Realm Structuring Elements

This illustrates the extent, role and character of the key features within the Greater Curtin Public Realm.

The public realm is supported by and reinforces the strategies embedded within the Integrated Urban Water Strategy and should be read in conjunction with this section (4.4).

For greater levels of detail and explanation of the public realm such as broad level approaches to species mix refer to Document C – Greater Curtin Delivering the Vision.

THE ILLUSTRATIVE PUBLIC REALM MASTER PLAN

The adjacent public realm master plan illustrates the overall structure and key elements of the public realm.



AREAS AND PLACES



THE AREAS

Across this plan are labelled the macro level initiatives that form the significant elements of the public realm strategy for Greater Curtin:

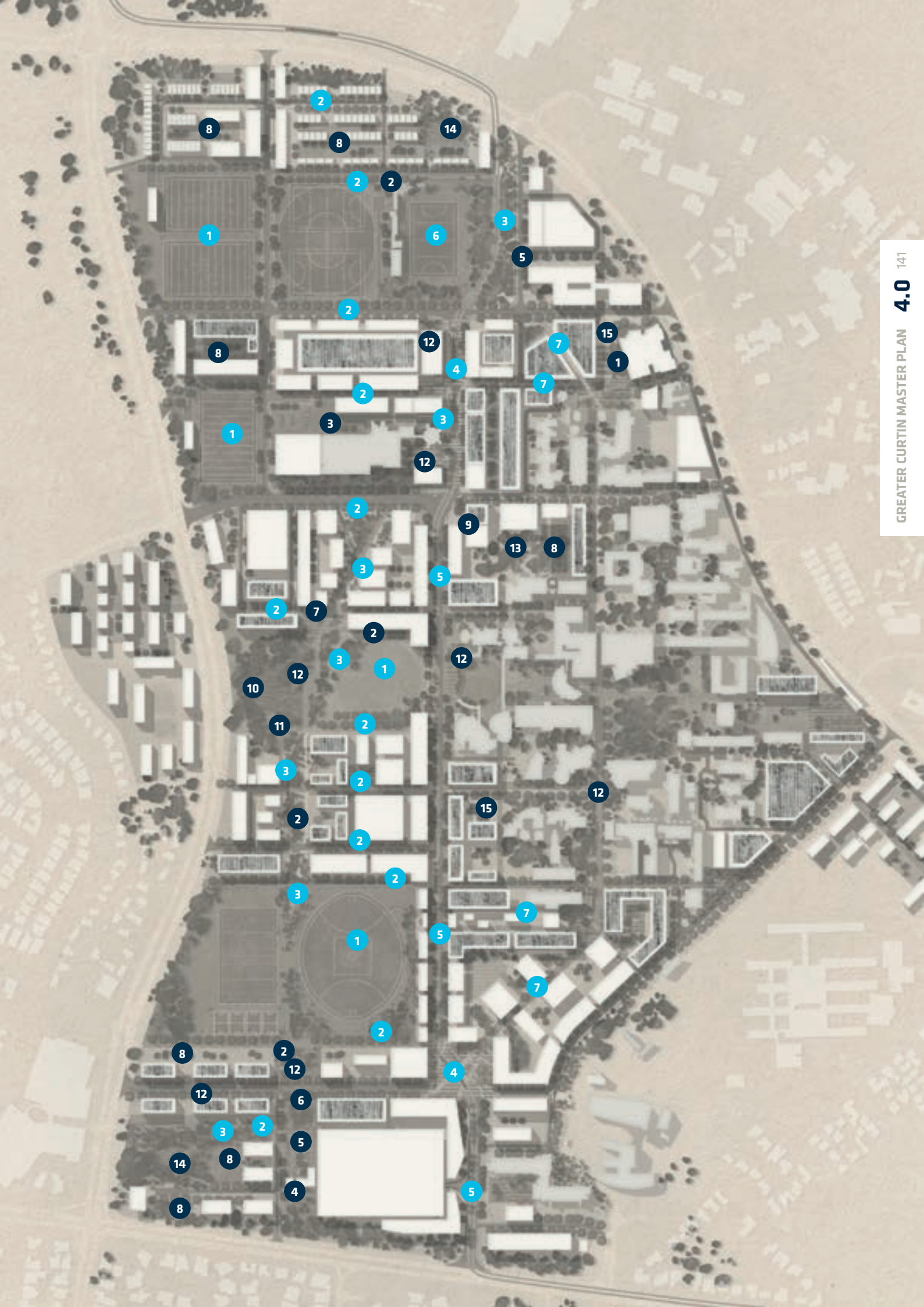
- 1 'The Greens' /Active Sports and Event Space
- 2 'Formal' East-West Links
- 3 Living Stream/Biofiltration & Retention)
- 4 Urban/Transit Plazas
- 5 Copsed Planting to Main Street
- 6 Hockey Stadium
- 7 Extension of Existing Corso



THE PLACES

Within this plan are labelled the finer grain initiatives of the Greater Curtin public realm strategy:

- 1 Orchard
- 2 Play Spaces
- 3 Community Gardens
- 4 Outdoor Lab/Meeting Area
- 5 Site Nursery
- 6 Biodiversity Hotspot (Retained Vegetation)
- 7 Water Theatre
- 8 Residential Gardens
- 9 Grand Balcony
- 10 Jack Finney Lake
- 11 Photo Opportunity/View
- 12 Water Feature
- 13 Fig Court
- 14 Reconstructed Wetland
- 15 Medicinal Gardens



PUBLIC REALM DESIGN PRINCIPLES

Underpinning all initiatives within the public realm are guiding design principles. These principles are organised into the six themes. They have been determined to guide all design considerations, opportunities and outcomes:



ENVIRONMENT AND SUSTAINABILITY

- Protect and enhance existing areas of environmental importance and strengthen physical links to establish 'Biodiversity Corridors' that connect into the wider landscape, beyond Greater Curtin
- Respond to and express the topographic and pre-development drainage patterns of the site
- The design of streetscapes and open space to integrate water sensitive urban design (WSUD) initiatives
- Encourage education and environmental awareness through overtly expressing and showcasing natural and constructed ecological processes within the landscape
- Develop initiatives to reduce the urban-heat-island and provide comfortable shaded environments in summer
- Design the public realm to deliver high standards of amenity and comfort
- Adopt a sensitive and strategic response to constructed micro climates through both location of facilities/uses (e.g. outdoor dining area) and plant species
- Select endemic plant species where possible to encourage biodiverse bird and insect habitats
- Use materials that feature low embodied energy, effective whole-of-life costs, low ongoing maintenance and are sustainably produced
- Promote opportunities to increase the attractiveness of non-motorised transport alternatives
- Minimise energy consumption in the design and operation of the public realm.



CHARACTER AND LEGIBILITY

- Celebrate Curtin's authentic historic and cultural architectural and landscape heritage
- Establish a site-wide open space structure that promotes good legibility and way finding through the enhancement of well-structured vistas and sight lines
- Draw upon embedded existing site qualities to inform the future character of the public realm
- Retain and enhance the context of existing mature native trees
- Establish a Pine (Pinus pinasta) management strategy that balances retention and renewal for heritage and amenity purposes with future ecological and biodiversity requirements
- The character and design of streetscapes is to respond in an integrated way to; street hierarchy and scale, adjacent built form and use, functional movement and WSUD requirements, entry locations, points of intersection, views and destinations
- Curtin must be maintained as an aesthetically 'green' city with the addition of innovative greening solutions in Greater Curtin
- Ensure all public space has a well-defined role and character
- Ensure building interfaces contribute to the use of public space.



COMMUNITY AND CULTURE

- Provide a mix of public spaces to support a diversity of social uses and meet the needs of the future population
- Design the public realm to maximise community-university engagement, education and learning opportunities (for example through the provision of external event spaces, interpretive signage, and external class rooms/laboratories)
- Encourage activity across generational and capability requirements
- Provide event/meeting places/facilities for multi-functional and adaptable use
- Offer a variety of open space opportunities including playgrounds and community gardens in close proximity to residential areas
- Develop a public art strategy that integrates place-responsive works into the landscape that prompt discussion, interpretation and delight.



PASSIVE RECREATION AND ACTIVE OPEN SPACE

- Provide appropriately located and adequately sized open spaces and facilities that support a range of active and passive uses
- Provide facilities that encourage activity from the wider community, build partnerships with elite athletic groups and foster cross faculty initiatives
- Meet requirements set by Greater Curtin Master Plan; Sport and Recreation Needs Assessment to provide at a minimum of 6.5m² of active space per resident
- Consolidate and rationalise fields to provide multi-functional adaptable open spaces
- Provide appropriate levels of public realm and recreational amenities for existing users, organisations and clubs as well as making provision for the informal recreational needs of the growing community – for recreational opportunities across age groups
- Provide shade trees and lighting structures/facilities to all recreational fields
- Use unobtrusive barriers to discourage undesired vehicular access to parks and sporting fields
- Ensure adequate provision of seating, drinking fountains, bins, public toilets, signage and other amenities in the public realm.



CONNECTIVITY AND LINKAGES

- Develop a movement network to support the important role of the Curtin Corso
- Strengthen existing campus structure by forming strategic external links
- Create a pedestrian and cycle network that promotes and encourages active transport and a healthy community, through ease of mobility within the site and strong connections to surrounding destinations and external networks
- Provide safe high-amenity transport routes supported by end-of-trip facilities to encourage sustainable travel to and within Greater Curtin
- Ensure strong visual connections and wayfinding in each neighbourhood.

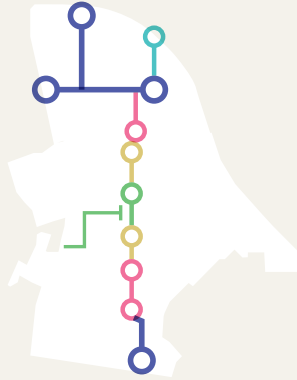


SAFETY AND ACCESS

- Create safe public open spaces, with appropriate levels of passive surveillance provided as a result of the strong relationship between space and built form
- Ensure adequate provision of lighting to all public realm areas and in particular the major pedestrian and footpath network
- Provide safe, equitable and secure access for all users (pedestrian, cycle and disabled) to all destinations including building entries
- Encourage passive surveillance opportunities and adjacent uses to increase the safety of public spaces
- Ensure lighting is designed to provide a safe and attractive public environment at night
- Ensure all paths are universally accessible; in particular connections between Main Street and the campus core.

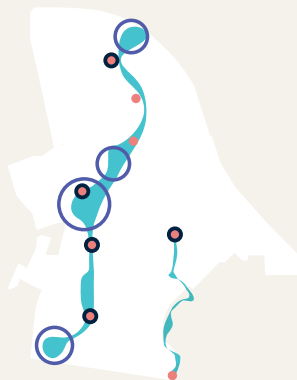
THE PUBLIC REALM STRUCTURING ELEMENTS

The Public Realm Structuring Elements illustrate and define the extent, role and character for the key features of the Greater Curtin Public Realm and are described on the following pages.



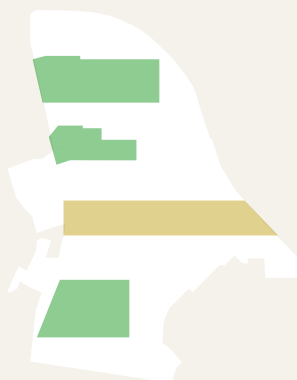
MAIN STREET

Connects the two key points of arrival and activity, and forms a central, organising spine and focus for Greater Curtin. The landscape proposal for Main Street is for a playful and informal structure that supports a variety of activities to achieved the desired dynamism.



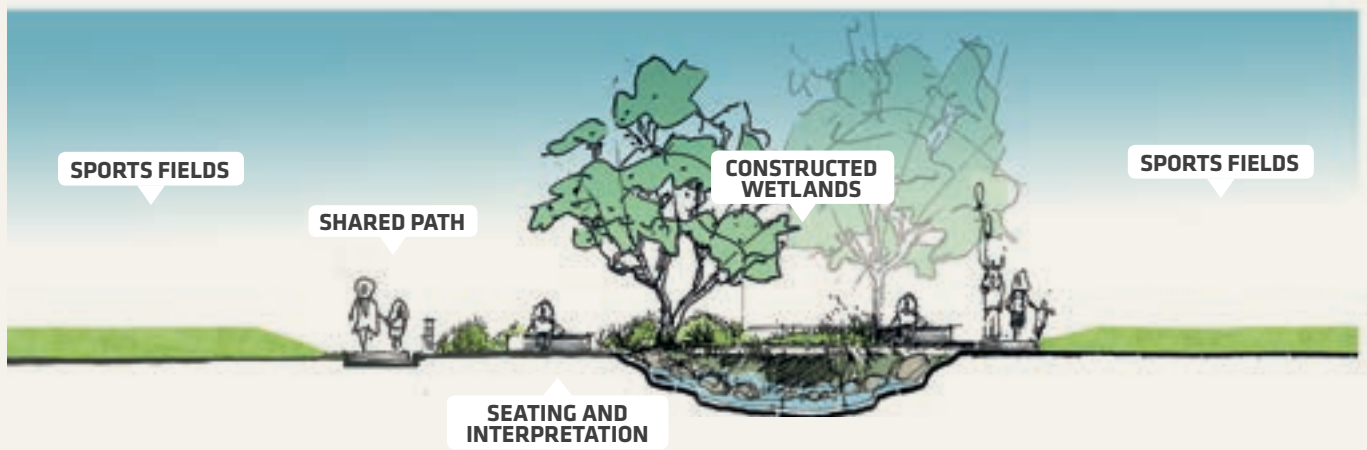
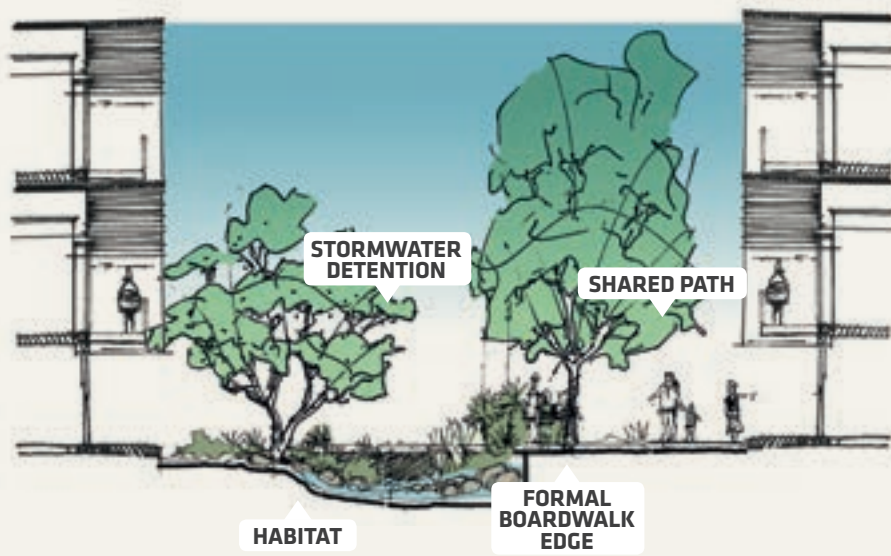
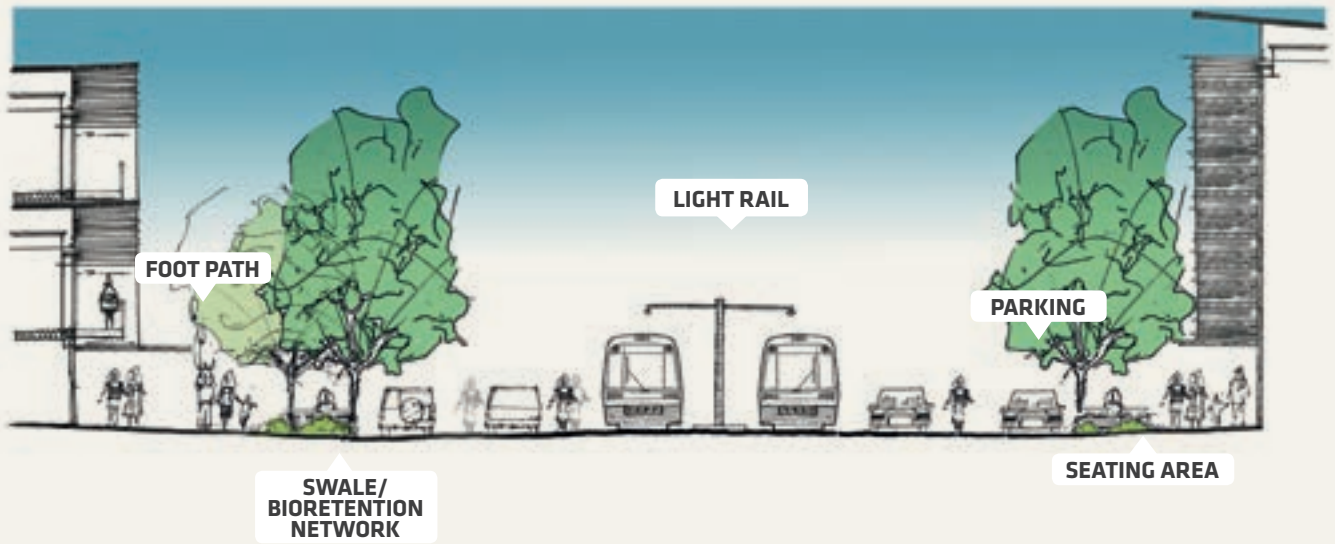
LIVING STREAM

Forms a third major north-south orientated corridor connecting the Greater Curtin neighbourhoods. It is distinct from the Corso and Main Street with its focus on aquatic and ecological initiatives, including water management, water play and 'biophilic design'.



THE GREENS

Will provide much of the open space for passive and active recreation at Greater Curtin and are divided into active sport and passive recreation areas.

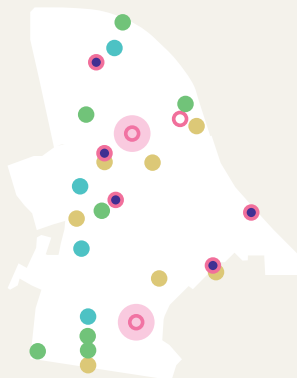




THE LINKS EAST-WEST

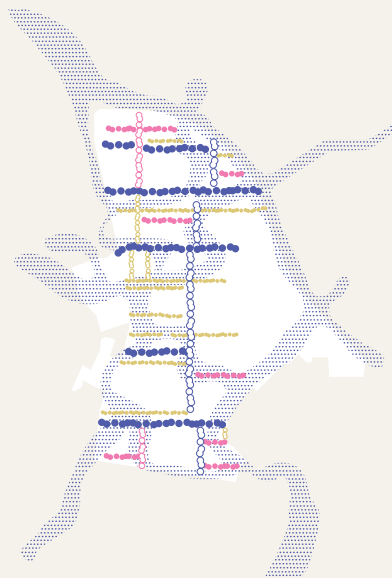
Form strong and formal vegetated armatures that connect pedestrians and cyclists from the existing hill-top campus into each development band. They also form a critical part of the water management strategy.

Responsiveness to aspect is important; refer northern and southern aspects illustrated.



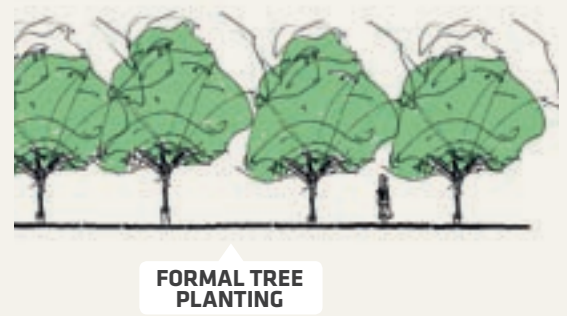
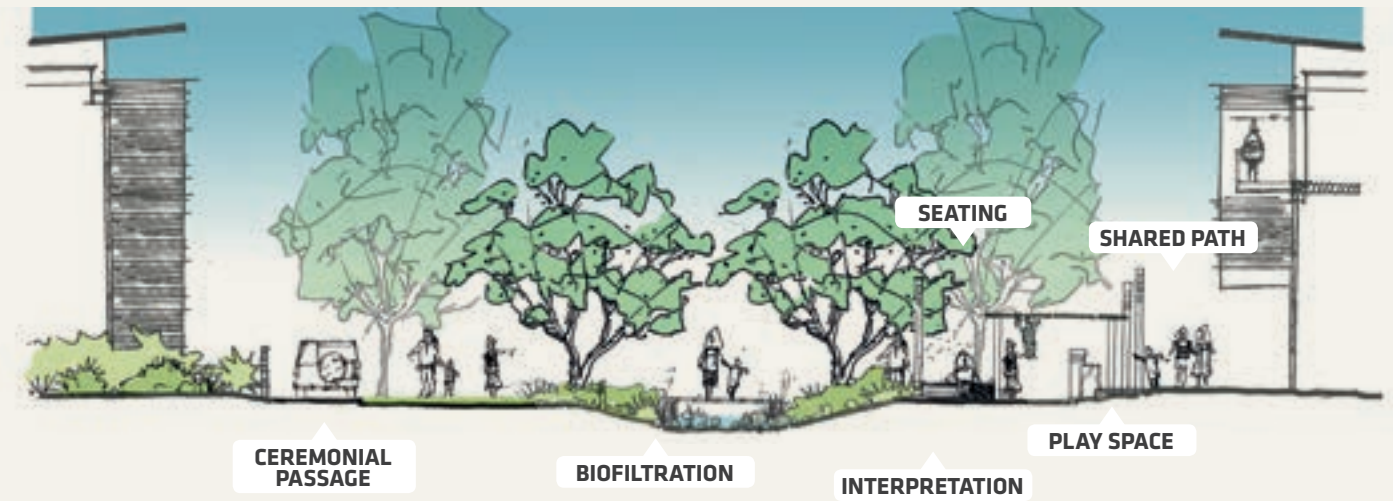
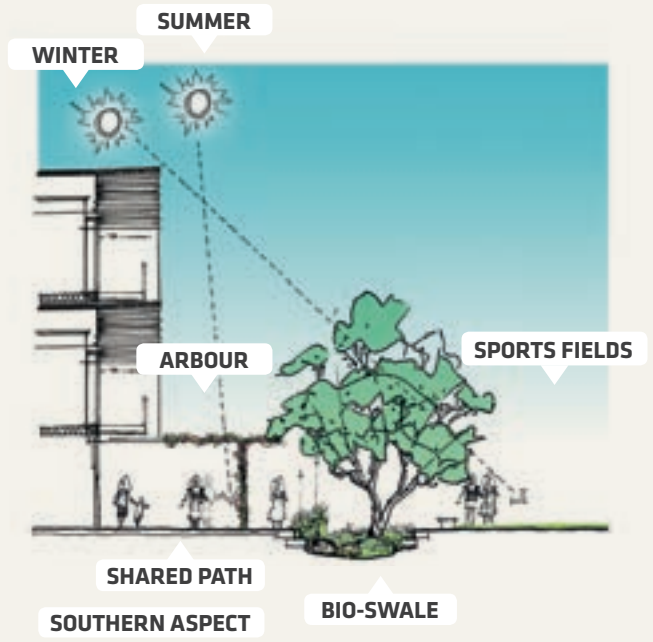
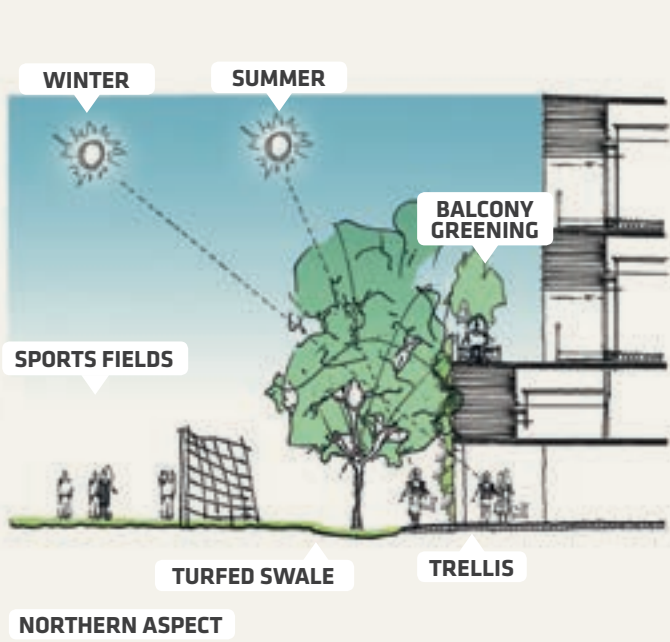
POINTS OF IGNITION

Are created at the intersection between Living Stream and green links. They are places of intensity and focus across community, educational, commercial and ecological thematic.



CORRIDORS AND CANOPIES

Build upon the master plan structure and movement hierarchy to dictate tree species that will contribute to streetscape and walkway character. Biodiversity links are also integrated through and beyond the site.





- Arrival Avenues
- Vibrant Active Centres
- Active Frontages
- Central Park & Ceremony
- Potential Views

MAIN STREET

INTENT

Main Street connects the two key points of arrival and activity, and forms a central, organising spine and focus for Greater Curtin. The landscape proposal for Main Street is for a playful and informal structure with copped tree planting (trees placed in tight groupings at irregular spacing) to promote an informal character. Main Street is not proposed as a grand avenue with single tree species planted formally along its length. The only exception being at the two transit hubs where short (approx. 50m) sections of formally arranged ‘avenue’ plantings of trees are anticipated.

CHARACTER

Main Street is composed of four distinct areas of character or chapters. The design of the public realm for these chapters responds to, reinforces and supports the land use strategy of the master plan:

- Avenues of arrival
- Vibrant active centres (transit hubs)
- Activated frontages
- Civic Green.

The principal initiative of the proposed strategy defines character zones by varying the selected tree species, for example stands of Pine trees (*Pinus pinasta*) are proposed (or retained) at intervals along Main Street (refer to the Canopy and Corridors diagram) to celebrate specific places and create focal points. As a rule existing trees should be evaluated in terms of their health and where possible retained and their setting augmented.

MATERIALITY

A foundation palette of street furniture, lighting and paving elements is defined to deliver unity along Main Street, with the key chapters of Main Street being further articulated with the inclusion of unique and custom elements that celebrate and respond to its character and use. The inclusion of flush kerbs along Main Street will promote a pedestrian/cycle friendly environment.

Main Street is connected to east/west streets and walkways, which are also key points of orientation. At these intersections and crossings further details in the ground plane (paving) should be used to help articulate and support wayfinding as well as providing increased levels of amenity with site furniture that responds to and supports pedestrian and bike use.

Main Street will incorporate water features and passively irrigated planter beds or ‘rain gardens’ to support the overarching water management established as a key structuring element of the master plan.



ARRIVAL AVENUES

FEATURE

- Retained Pine stands
- LRT alignment through the landscape
- Integrated public art
- Integrated Living Stream or WSUD initiatives

- Directional signage
- Strong green corridors with connected canopy
- Informal parkland edge to street.



VIBRANT ACTIVE CENTRES

FEATURE

- A vibrant and colourful character
- Paved urban plazas
- Integrated street design with LRT as well as pedestrian areas delivering shared spaces
- Strong tree canopy
- Integrated urban 'Living Stream' elements

- High-quality feature lighting to promote safe and attractive evening uses
- Integrated public art
- Strong visual and physical relationships between the street space and built edges
- Urban squares supporting a range of civic activities
- Include publicly accessible green roof/balcony areas.



CENTRAL PARK

FEATURE

- Formal 'green' and civic parkland
- Opens out to lawn with views over lake and Living Stream
- Focus for large formal events
- No street trees in Main Street to maximise views across Central Park.

CEREMONIAL PASSAGE

FEATURE

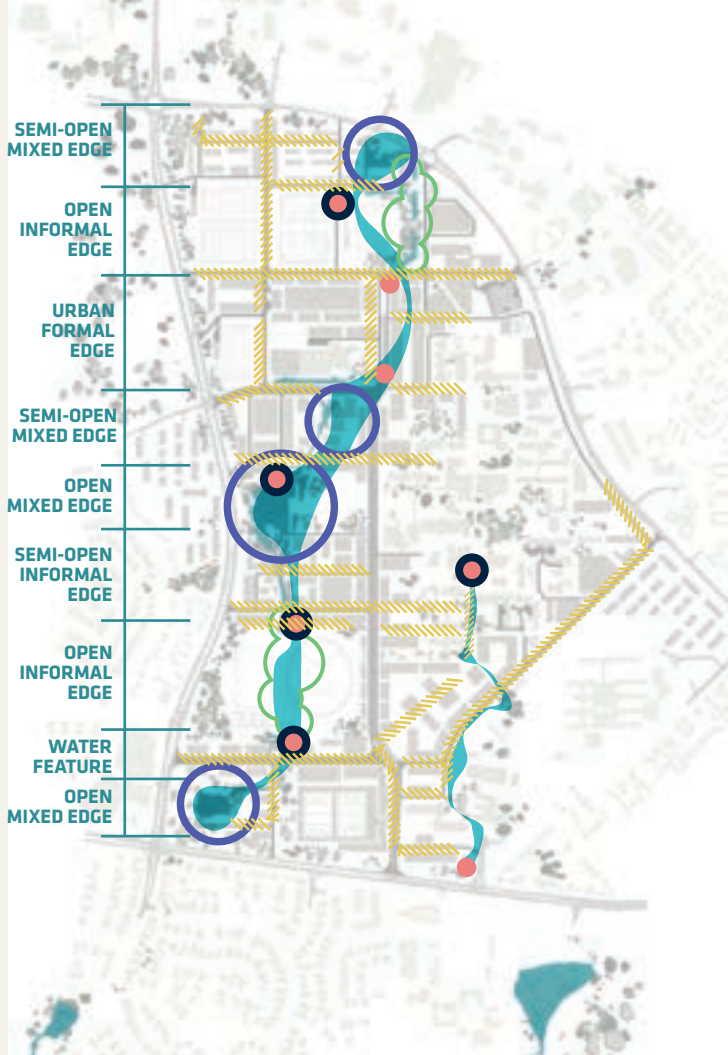
- Lake and parkland views
- Shared space for limited vehicle use and controlled access for specific events and arrival of dignitaries
- Showcases the key iconic views and features of Greater Curtin
- High-quality finishes and maintenance
- For more information refer Wayfinding 4.0 Delivering the Plan Design Guidelines.



ACTIVE FRONTAGES

FEATURE

- Clear physical and visual relationship between building edges and life on the street
- Furniture to support occupation and habitation of the street
- Passive surveillance.



- Open Water
- Water Features
- Play
- Flow
- Swales and Bioretention Network



LIVING STREAM

INTENT

The 'Living Stream' or 'Water Corso' forms a third major north-south orientated corridor connecting the Greater Curtin neighbourhoods. It is distinct from the Corso and Main Street with its focus on aquatic and ecological initiatives, including water management, water play and 'biophilic design'. Within this corridor the emphasis is on encountering buildings and places that connect people and nature, an environment that reflects a love of life or living systems and the creation of healthy and productive habitats for a contemporary community.

The central ideas of water, connection and flow remain constant along its length. Design initiatives within the corridor include a variety of features, from natural open waterscapes to flowing streams and formal water features, as well as bio-treatment areas such as vegetated swales and constructed wetlands. The 'Living Stream' includes a shared path (pedestrian and bike) to support non-motorised movement as well as a series of varied destinations that provide diverse and engaging experiences.

WATER

The alignment of the 'Living Stream' traces and represents, in the contemporary landscape, historic paleochannel and Indigenous trails. Proposed water bodies are indicatively constructed in locations of former wetlands, and connected by permanent and ephemeral streams, rain-gardens and constructed wetlands.

The Living Stream is the backbone of Greater Curtin's Integrated Water Management (IWM) strategy, and translates storm water collection and reuse activities into an engaging and dynamic landscape feature. The Living Stream benefits from a surplus of water. Excess water will be expressed and circulated through the Living Stream achieving permanent water bodies and flows in selected locations and sections.

CHARACTER

Weaving its way through the site, the Living Stream forms a physically connected space and volume for water conveyance and non-motorised movement. Its character continually changes, from formalised constructed edges in a compressed urban environment to open and natural conditions in the parkland landscapes.

Vistas and key views, framed between buildings, are choreographed to enhance orientation and reinforce iconic views to heritage features. Where the Living Stream passes through east-west aligned bands of built form tree planting and canopy structure will be dense to provide shade and respite. Where it passes across active or passive open space the density of proposed tree planting and canopy structure is reduced and focus is on low shrub and ground cover to promote ground level visibility and aid legibility.

Community facilities have been focused at 'points of ignition', where the Living Stream intersects the urban grid. The stream provides the network that connects these diverse community destinations and provides a platform for interpretation that encourages interaction with the watercourse, other natural systems and Indigenous heritage through play and education.

Jack Finney Lake and a newly-defined Central Park establish an important anchor point for the Living Stream. The lake will feature a 'natural' edge to the west and 'formal' constructed edge to the east, with boardwalks, bridges and stairs providing access to water. This provides Greater Curtin's Central Park, a place of diverse activity and a place for students, residents, workers and visitors alike.



OPEN WATER

FUNCTION

- Stormwater detention
- Biofiltration
- Education WSUD signage
- Indigenous interpretation and expression.

CHARACTER

- Natural/hard edge
- Timber boardwalk and platforms
- Shade structure and balustrade edge
- Access to water edge
- Feature islands and bridge structures.



PLAY

FUNCTION

- Primary contact with water promoted
- Vegetation infiltration
- Spectacle and delight
- Education WSUD signage
- Natural play – connect with natural materials.

CHARACTER

- WSUD planting
- Timber boardwalk/log
- Dams.

SPECIAL WATER FEATURE

FUNCTION

- Different forms of water
- Exhibition/display
- Touch sound and play
- Contemporary display.

CHARACTER

- Interactive
- Water jet
- Water channel
- Mist.



FLOW

FUNCTION

- Different forms of edge conditions (soft and formal)
- Conveyance
- Accessibility and biofiltration to water in places.

CHARACTER

- Flowing forms
- 'Eddies' to create intimate seating areas.



SWALES

TYPE

- Formal swales
- Bio-swale/natural swales.

FUNCTION

- Surface stormwater channel
- Biofiltration
- Education WSUD signage.

CHARACTER

- Combination of hard and soft edges
- Timber crossings
- Wetland planting.

BIORETENTION NETWORK

FUNCTION

- Short-term stormwater retention
- Biofiltration
- Passive irrigation.

CHARACTER

- Raingarden on road verge
- WSUD planting.



- Stadium Extension
- Passive Sports Field
- Active Sports Fields
- Roof Sports Courts

Greater Curtin Sport Field Provisions

1. 2 x Rugby League/Soccer fields (shared)
2. 2 x Grass Hockey Pitches/
1 x Cricket Oval (shared)
3. Hockey Stadium
4. 2 x Tennis Courts/2 x Netball and
2 x Basketball Courts (shared)
5. 2 x Beach Volleyball Sand Courts
1 x Netball/1 x Tennis (shared)
6. 1 x Grass Rugby/Soccer Fields (shared)
7. Curtin Stadium proposed extension
with 3 x Netball Courts/
4 x Tennis Courts on roof (shared)
8. Informal Recreation/Ultimate Frisby
9. 1 x AFL Oval and 1 x Rugby Union/
Gridiron (shared) and 4 x 5 A-side Soccer

THE GREENS

INTENT

The 'Greens' will provide much of the open space for recreation at Greater Curtin and are programmed to support both active sport and passive recreation. They are located to provide equitable distribution of open space for the Greater Curtin community. The overarching objective outlined in the master plan Sport and Recreation Needs Assessment (SRNA) was for the Greater Curtin master plan to achieve a status-quo provision for both active sport and passive recreation against existing.

Active Sport Provision

With population predictions for Greater Curtin of approximately 10,200 residents by 2031 the SRNA suggests a minimum provision of 6.5m² of active open space per resident. This sets a requirement for a minimum allocation of 66,330m² to meet the guideline. The Greater Curtin master plan provides a total of 96,534m² of active open space (including all turfed, artificial and sand surfaces). This is an increase of approximately 6,000m² from existing provisions (90,284m²), and has been achieved through the rationalisation of existing open space to develop a more efficient spatial plan.

Curtin currently operates on a student calendar – over summer students vacate the campus, resulting in low memberships of summer sports clubs. As Curtin University evolves into Greater Curtin and a permanent residential population takes up residence, there will be an increased requirement to cater for year round sports, in the plan including an increased area and additional hard-courts for tennis, netball, basketball and sand courts for volleyball. The diagram illustrates this diversity of provision, in line with the recommendations of the SRNA.

Sport Hubs

Three sports hubs are proposed – two to the north, one to the south. The northern greens are located jointly with the existing sports stadium and hockey stadium to promote and foster Curtin's alliance with Hockey WA and elite sport. The southern green provides residents and the wider community with immediate access to open space and maintains flexibility for two full size football ovals if required.

Retention and improvement of active open space is balanced in the plan with the need to accommodate other development opportunities. The master plan has looked to innovative solutions, for example accommodating synthetic pitches and hard courts on large roof structures to maximise the efficiencies of land use. In addition, fields typically accommodate more than one sport to maximise utilisation across sporting

seasons and major fields meet high quality standards including sizing, access to facilities, clubrooms and lighting. Where possible, facilities such as toilets and clubrooms have been grouped to service multiple fields and provide further efficiencies.

Central Park

The central green or 'Central Park' provides the central focus for informal recreation in Greater Curtin.

CHARACTER

- The 'Greens' form strong east/west aligned bands of open space edged by development
- The positive visual and physical relationship between the built edges and greens enables higher levels of natural surveillance and therefore safety to be achieved
- Key East-West Links are aligned to edge the greens, establishing the greens on strong desire lines and generating activity and animation along these shared movement corridors
- In locations where the 'Living Stream' passes through the greens, natural and wetland planting reinforces the idea of this key feature.

Strategically located stands of existing and proposed Pines create visual focal points, as well as natural canopies that provide climate comfort for spectators, residents and visitors simply enjoying the outdoors.



ACTIVE SPORTS FIELDS/TURF

FUNCTION

- Active sports
- Passive recreation
- Large Events.

CHARACTER

- Open space
- Innovative fencing
- High level flood lighting.

CENTRAL PARK

FUNCTION

- Civic Green
- Passive Uses
- Formal Events (Graduation, O'Days)
- Community Sports.

CHARACTER

- Calm and open
- Axial orientation
- Well maintained
- Structured.



ROOFTOP SPORTS COURTS

FUNCTION

- Small court sports
- Rainwater collection
- Roof top cinema.

CHARACTER

- Open
- Artificial and colourful surfaces.



- Urban Links
- Road Verge Links
- Landscape Links



THE LINKS EAST-WEST

INTENT

Curtin's existing campus structure has informed the location of a series of east-west links or desire lines that connect key destinations across Greater Curtin. Each link will be unique in character and can be categorised into three basic forms:

- Road verge link – integrated with street
- Urban link – pedestrian walkway between built form
- Landscape link – built form edge to open space.

They will be consistent along their length to form strong (legible) and formal green armatures that connect pedestrians and cyclists from the existing hill-top campus into each development band. They will form a critical part of the water management strategy through integration of swales and below ground rainwater storage facilities.

MICRO CLIMATE CONTROL

East-west green links will provide overhead weather protection through inclusion of awnings, trellis structures or tree plantings with connected canopy. Full weather protected awnings (where possible) will connect with existing campus arcades, under crofts and other covered areas to achieve an integrated system of covered walkways that promote non-motorised transportation throughout Greater Curtin. Vines and climbing plant species will integrate with trellis/shade structures to form large-scale hybrid vegetative structures.

Each east-west link will be designed responsive to aspect; on a northern building façade shade protection will be a focus for warm months whilst gaining thermal advantages through winter sun penetration. On a southern building façade summer sun together with cooling breezes shall be the focus. Plant species will also be responsive with deciduous trees typical to northern aspect and evergreen typical to southern aspect links. Tree planting along these links will be formal avenue plantings at equal spacing.

MATERIALITY

Pavements to all east-west green links will be constructed from unit paving (both concrete and brick) with pavements featuring colourful and playful pavement patterning. Tree structure and design is outlined in Corridors and Canopies and species are outlined in Document C – Greater Curtin Delivering the Vision.



URBAN LINKS

FORM/TYOLOGY

- Awnings/shade structures
- Arcades
- Spaces between buildings; undercroft, courtyards
- Public laneway within campus
- Private laneway between buildings.

FEATURE

- Vertical planting
- Raised planting bed
- Seating/adaptable furniture
- Exhibition space
- Lighting for night use.



ROAD VERGE LINKS

LOCATION

- North or south side of street
- Adjacent to road reserve.

FEATURE

- Wider footpath
- Retail frontage.

LANDSCAPE LINK

- Northern aspect
- Southern aspect
(Refer cross sections on page 146 of 4.6 Public Realm).

LOCATION

- Along side of open space

FEATURE

- Arbor
- Broad footpath
- Retail frontage.





- Civic Space
- Event Space
- Green Community Infrastructure
- External Educative Areas
- Major Play Spaces/Destinations



POINTS OF IGNITION/ CULTURAL NODES

INTENT

At the intersection between Living Stream, green links and the grid, opportunities ignite. These are places of intensity and focus across community, educational, commercial and ecological thematics. From an urban plaza to play zones, community gardens and urban orchards to outdoor lab or external meeting space, the intent is for underlying layers in the master plan to be expressed at these points of exchange and innovation. They will be designed to accommodate people coming together.

CHARACTER

Each point of ignition will be unique in character given the variety of uses and locations. As points of celebration they will stand out visually from surrounding urban fabric through use of dynamic form, colour and design expressed through structures and elements, lighting, signage and selection of materiality.

AMENITY

As each point will become attractors an appropriate level of amenity will need to be provided dependant on use. Shade and wind protection, lighting, power and Internet access, toilets and running water/drinking fountains are some considerations. Integrated public art and interpretive signage will also be incorporated to provide perspective on relevant socio-cultural, technical or historic information.



CIVIC SPACE

LOCATION

- Along Main street in association with light rail station.

FEATURE

- Markets
- Festivals
- University Open Day
- Shopping
- Food and drink
- “See and be seen”.

GREEN COMMUNITY INFRASTRUCTURE

FUNCTION

- Passive recreation or site for community engagement.

LANDSCAPE FEATURE

- A – Passive Recreation
- B – Community/Medicinal Gardens
- C – Grand balcony (roof garden)
- D – Site Nursery/Community Garden
- E – Biodiversity hot spot (remnant vegetation to be retained and protected)
- F – Urban Orchard.



EXTERNAL EDUCATIVE AREAS

LOCATION

- Close to University buildings
- Plazas
- Living Stream.

FEATURE

- Outdoor study space
- Exterior Labs/studios
- Exhibition space
- Hot spots.

EVENT SPACE

FUNCTION

- Variety of scaled external spaces for small and large events.

FEATURE

- Amphitheatre
- Outdoor cinema
- Markets
- Concerts
- Theatre.



MAJOR PLAY SPACES/ DESTINATIONS

LOCATION

- Close to Residential lots
- Living Stream
- Local parks.

FEATURE

- All inclusive and repurpose (1)
- Water (2)
- Urban (3)
- Nature (4).



- Recreation
- Bush Forever
- Remnant Vegetation
- Existing Pinus pinasta to be retained and replanted
- Existing Pinus pinasta not to be replanted
- Proposed new stands of Pinus pinasta
- Existing trees to remain including Vegetation Outside Site Boundary Linking to Regionally Significant Biodiversity Areas
- Roof Gardens
- Biodiversity Links



ROOF GARDENS

LOCATION

- Indicatively located to reflect the paleochannel and expressed onto roofs.

FEATURE

- Urban Agriculture (intensive)
- Ecological habitat & Biodiversity (extensive)
- Roof Top Bars & Terraces (intensive)
- Viewing Platforms & Balconies (intensive).

CORRIDORS AND CANOPIES

INTENT

The term 'corridors' refers to biodiversity links whilst the term 'canopies' refers to street and walkway tree planting.

CORRIDORS

Greater Curtin will provide biodiversity corridors and enable creation of diverse habitats for wildlife which can become complex ecosystems that support a wide range of plants and animals. The Living Stream is intended not only to serve as an infrastructure component that treats and conveys water, but also to integrate biodiversity. Additional linkages of remnant vegetation with roof gardens and new native landscaped areas will strengthen biodiversity values and regional connections.

Biodiversity corridors will strengthen regional linkages between Bush Forever sites and improve the overall biodiversity of the area locally and regionally. Interpretive or educational walking trails will lead visitors and students through the site and to surrounding environments, particularly that of the Canning River south of the site.

The lack of native vegetation on site offers opportunities to increase biodiversity whilst linking vegetation on site to that of the surrounding areas and provide for improved habitat values (e.g. to Carnaby's Cockatoos) and amenity. Opportunities to enhance the quality of living and studying within Greater Curtin through a planned biodiversity landscape strategy will also provide economic benefits in terms of reduced energy use and stormwater management.



EXISTING PINUS PINASTA STANDS

LOCATION

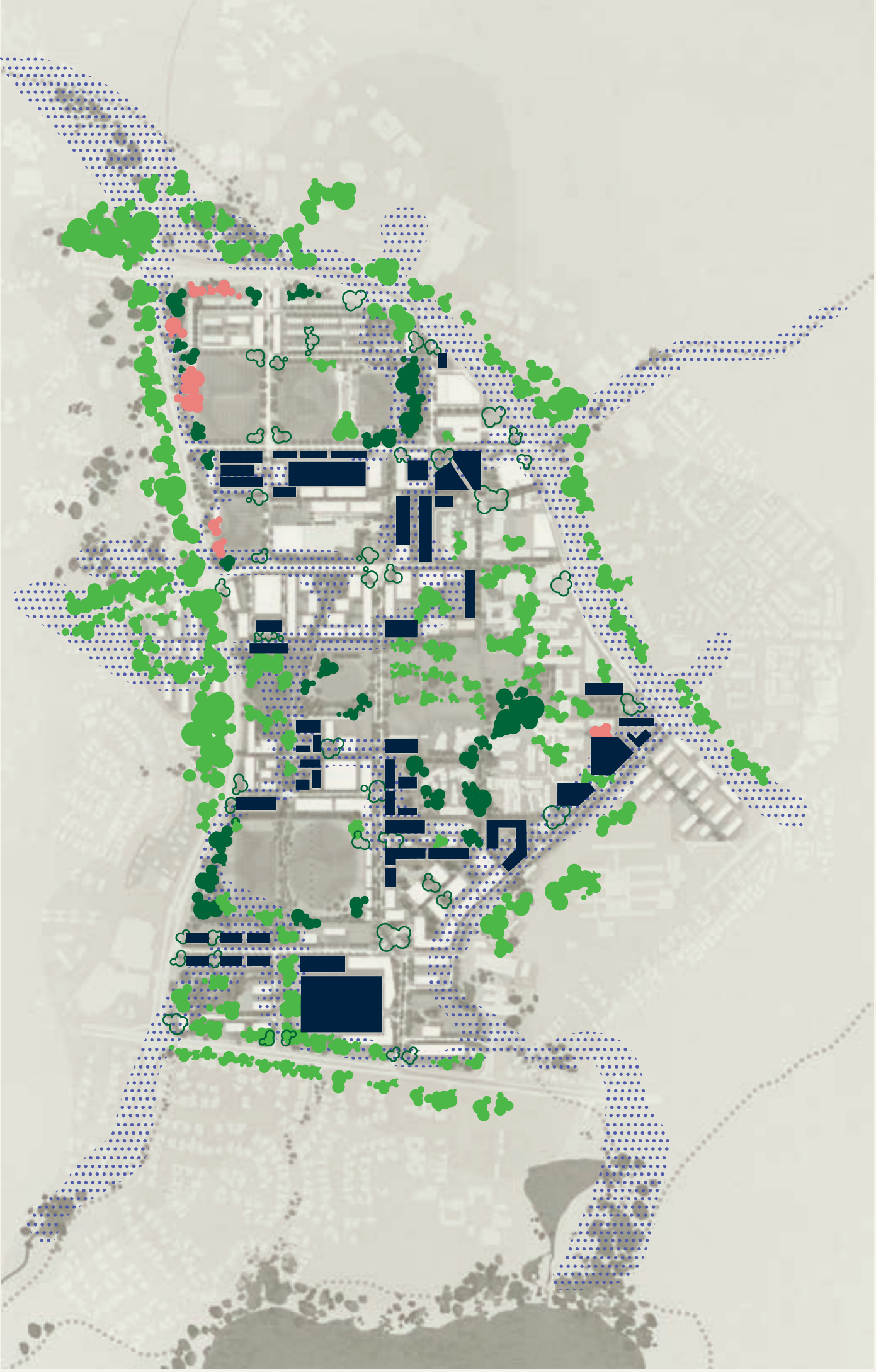
- Networked stands distributed throughout Greater Curtin
- Points of ignition.

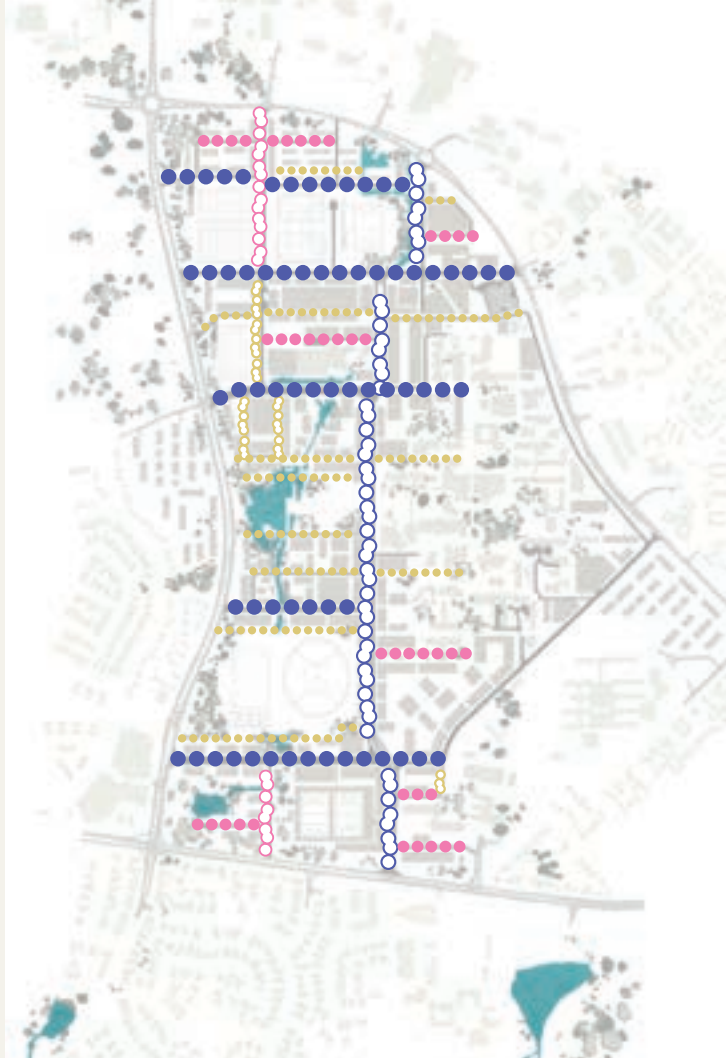
FEATURE

- Foraging and nesting for Carnaby's Cockatoos
- Curtin's botanical heritage.

EXISTING AND FUTURE PINUS PINASTA

- Incorporate both retention of existing and new plantings of Pinus pinasta in formal groupings or 'stands'. Stands of Pinus pinasta are defined in Document C – Greater Curtin Delivering the Vision, along with a strategy for integration within the master plan.





East-West Formal Planting

- 25 metres plus
- 15-25 metres
- 8-15 metres

North-South Copsed Planting

- 25 metres plus
- 15-25 metres
- 8-15 metres

CANOPIES

This key layer of the public realm strategy builds upon the master plan structure and movement hierarchy to dictate tree species that will be key contributing factors to streetscape and walkway character. The over-riding strategies are:

- Apply a palette of predominantly native Australian tree species (endemic or West Australian where possible) appropriate for street and pedestrian walkway tree planting that are sustainable, provide high quality amenity and aesthetics, are minimal in maintenance requirements, provide good longevity, and are ecologically appropriate to Curtin. A list of species is provided in Document C – Greater Curtin Delivering the Vision
- Establish a minor palette of non-native species for use in specific locations/ situations as required to achieve microclimatic or amenity/character outcomes; for example deciduous species to allow winter light penetration
- Respond to cross sectional scale and volume of streetscapes/walkways in selecting correctly sized tree species that complement neighbouring built form
- As outlined in both the east-west green links and Main Street sections above, institute a site-wide dichotomy between formal and informal planting to east-west and north-south orientated streets and walkways respectively
- Informal north-south orientated streets to feature copsed tree planting
- Formal east-west orientated streets to feature regularly spaced and aligned tree planting.



COPSED TREE PLANTING



FORMAL TREE PLANTING



LARGE

25 METRES + INDICATOR SPECIES

- *Corymbia maculata*
- *Eucalyptus gomphocephala* (right)
- *Liquidambar styraciflua* (left)
- *Platanus x acerifolia*.

MEDIUM

15-25 METRES INDICATOR SPECIES

- *Allocasuarina fraseriana*
- *Agonis flexuosa* (right)
- *Eucalyptus sideroxylon*
- *Eucalyptus todtiana*
- *Melaleuca quinquinervia*
- *Melaleuca raphiophylla*
- *Ulmus parvifolia*
- *Pyrus ussuriensis*.



SMALL

8-15 METRES INDICATOR SPECIES

- *Banksia grandis*
- *Callistemon viminalis* 'captain cook' (left)
- *Eucalyptus torquata* (right)
- *Hibiscus tiliaceus*
- *Olea europaea*.



4.7 URBAN FORM AND CHARACTER

INTRODUCTION

Greater Curtin will be a truly unique place to live, work, learn and play, with a built form character that supports innovation and collaboration. The progressive development of Greater Curtin will transform the existing academic campus into an exciting urban centre characterised by university life.

Greater Curtin will be urban; it will be a compact, efficient and livable city with a distinct form and character. Residential, retail, commercial, social, cultural, educational, recreational, sporting and transit activities will be accommodated in a dense urban matrix typical of a compact city.

The Greater Curtin Master Plan sets in place a legible and ordered structure. This structure provides efficient property lots to support a wide range of development opportunities. The lots are framed and supported by a legible and robust public realm of streets, pathways and squares, with a generous network of landscaped open spaces an integral part of the city.



Greater Curtin's urban form and structure is defined by:

- Distinct and compact development bands
- Rational 'superlots' defined by streets and open spaces
- A gridded street pattern with a clear street hierarchy
- Integrated landscape systems and a network of open spaces
- A responsive architecture and landscape that respects and works with the local climate, topography and heritage
- Legible gateways
- Diverse building typologies
- Well considered and appropriate building heights
- Building setbacks that support activity on the street
- Permeability that supports and encourages safe and comfortable pedestrian movement.

Greater Curtin's urban character is defined by:

- The demographic characteristics of Greater Curtin's community
- Development/land use density
- Compression and mix of activities
- Visually distinctive built form and spaces
- Building materials
- Diverse urban housing that supports a diverse community
- An integrated multi-modal transport network, including light rail
- Focused streetscape activation
- A clearly defined and well-designed public realm with an obvious spatial hierarchy
- Landmark architecture that reinforces the master plan's urban structure and overall legibility
- Built form innovation – construction technologies, sustainability initiatives, and smart technologies.

URBAN STRUCTURE: DEVELOPMENT BANDS AND STREET PATTERN

Five distinct bands of built-form development establish a macro level structure for Greater Curtin (see Figure 2B). Each development band extends from the existing academic campus, across Main Street, to the site's western boundary. Each band is edged by a similarly sized landscape 'green' that supports both active and passive recreation (see Figures 2A and 2C).

Main Street or 'Curtin Boulevard' is the primary north-south road that defines the central axis of the city (see Figure 1A). Main Street is a link that connects each development band. Both the north and south ends of Main Street feature a large urban square. Activity around each will be intensified by the diversity of land use mix anticipated and positive relationships established at street level. Both squares accommodate Light Rail stops. The northern square includes direct access to a Bus Interchange and integrated car park integrated with commercial, retail and residential properties.

There are service roads, shared pathways, courtyards and public squares within each development band. The pathways that cross Main Street extending into the academic campus will function as clear pedestrian pathways between the existing campus and the new developments (Figure 1B). As these pathways are important structuring elements of the master plan, functioning to link the existing campus with new development, it is important that the architectural design and street-level activities of all new buildings reinforce the desired function and pedestrian prioritised nature of these linkages.

Building lots are arranged according to the hierarchical network of roads and paths. Specified setbacks, streetscape alignments and degrees of permeability are required by each project to reinforce the street pattern hierarchy, provide spatial clarity and interest, and ultimately achieve the desired urban form and pedestrianised urban character.

GATEWAYS

Greater Curtin has three primary gateways supported by a network of well-defined secondary streets (See Figure 1C). These gateways will be defined by wide, tree-lined corridors, designed to accommodate public transport and higher traffic volumes. Taller buildings are also concentrated along these key streets and reinforce their gateway role. Each street connects the boundary streets of Hayman and Manning Roads to the primary urban squares and central spine of Main Street. They are significant within the master plan and development lots fronting them require high quality outcomes with uses that benefit from convenient access and high levels of exposure and activation.

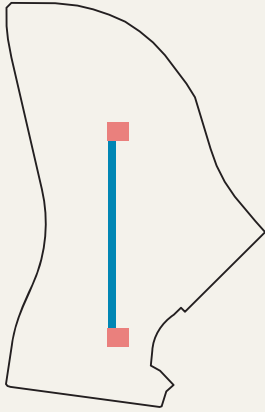


FIGURE 1A:
MAIN STREET AND
PUBLIC SQUARES

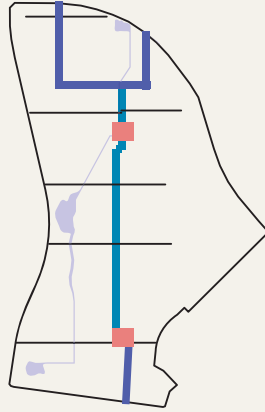


FIGURE 1B:
GATEWAYS AND PATHWAYS

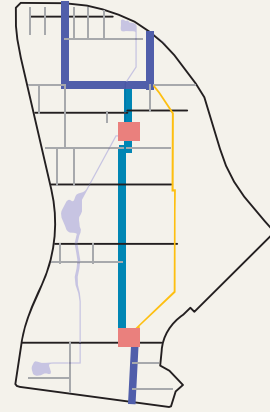


FIGURE 1C:
ROADS, PATHWAYS,
NETWORK AND CORSO

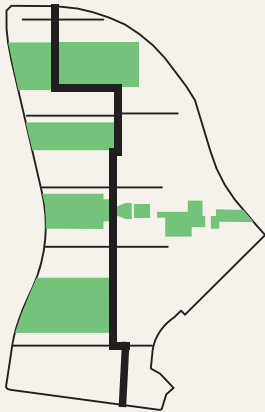


FIGURE 2A:
LANDSCAPE BANDS

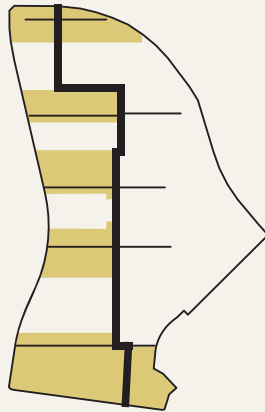


FIGURE 2B:
DEVELOPMENT BANDS

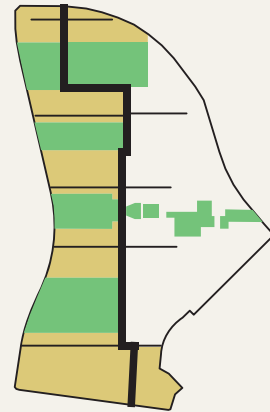


FIGURE 2C:
LANDSCAPE AND
DEVELOPMENT BANDS



FIGURE 3A:
FIGURE-GROUND PLAN:
EXISTING CORE CAMPUS



FIGURE 3B:
FIGURE-GROUND PLAN:
NEW BUILDINGS SCENARIO

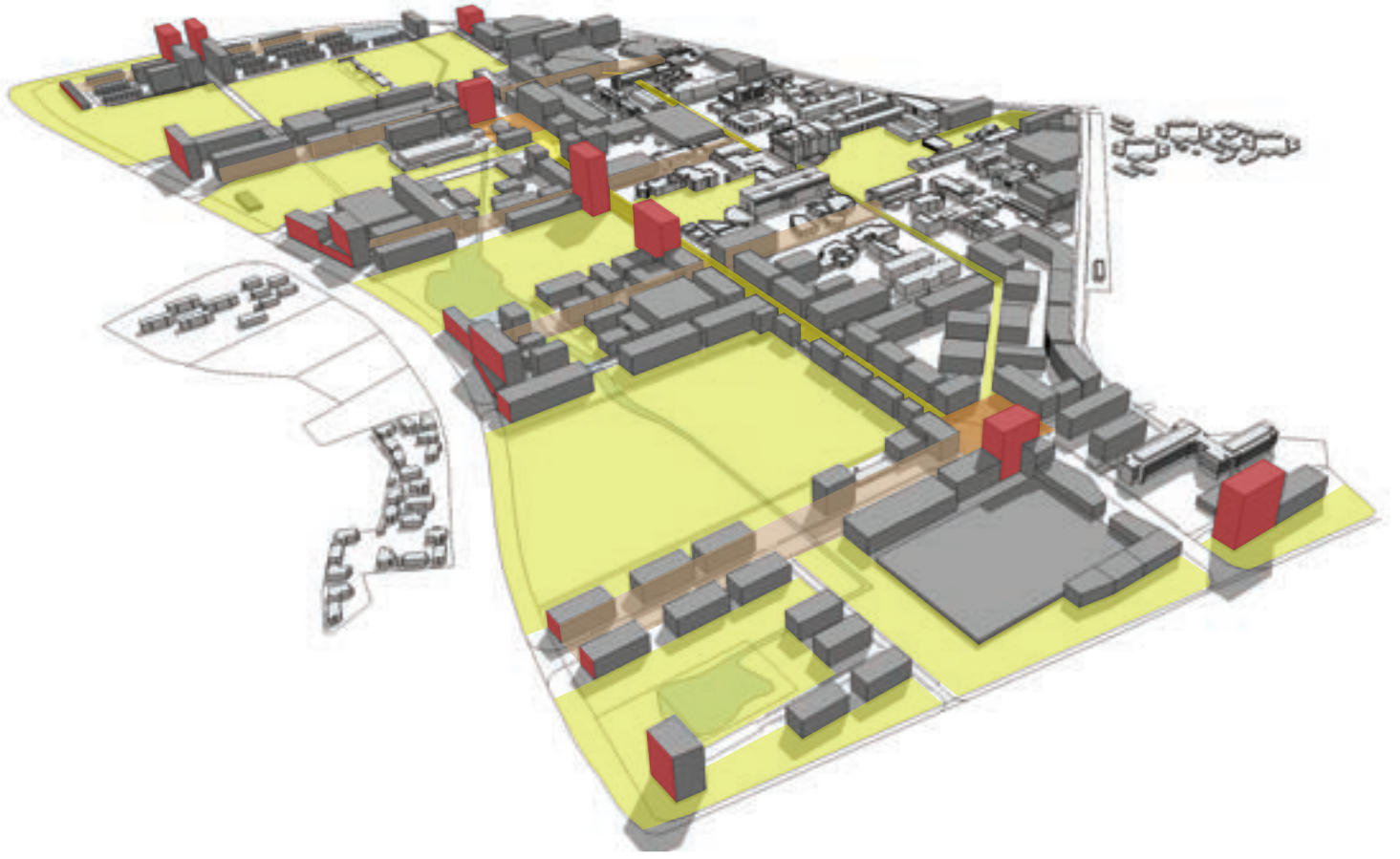


FIGURE 3C:
FIGURE-GROUND PLAN:
DEVELOPMENT SCENARIO

URBAN PROFILE

Greater Curtin will be identifiable by its distinct appearance. The original campus plan claimed the site's highest land with the grouping of the Library, Theatre, Administration, Cafeteria, and Architecture & Planning buildings. Near the Library is the campus' only tower, a mid-level structure that accommodates the Social Sciences faculty. These buildings, and the site's topography set a convenient height datum and reference against which new buildings will be seen.

The diagram opposite identifies specific lots along Main Street that are designated for new tower elements. These sites are identified for quality developments that will project a clear and attractive profile when seen from distant vantage points. The tower sites have been strategically selected to contribute to the urban character of Greater Curtin, and it is expected that buildings on these sites present opportunities for iconic architecture with a commanding character at street level.



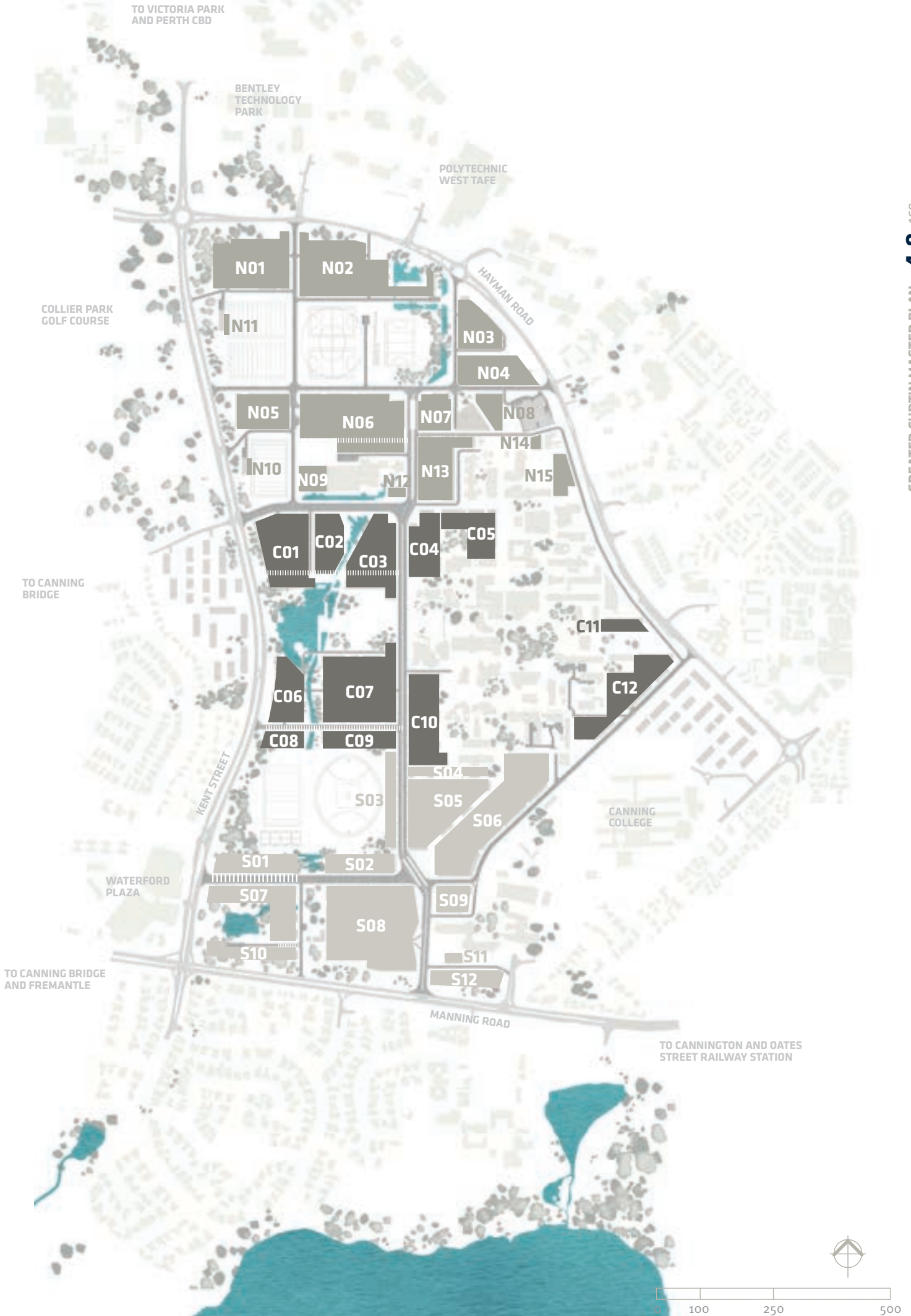
DEVELOPMENT SUPERLOTS

The largest land parcels for development, the superlots, are defined by streets and shared pathways to provide access and a legible address of each future building. Each development band is comprised of two or more superlots. Future buildings on superlots along the western boundary are to have prominent façades facing Kent Street.

Superlots define the largest single development areas. Superlots cannot be amalgamated. Each superlot presents opportunities for sub-division into smaller lots to accommodate building typologies and development sizes required for specific uses and conditions. The diagram opposite illustrates proposed division of superlots.

Development controls for each superlot have been devised to reinforce the formal structure of Greater Curtin and ensure the emergence of a cohesive urban form. The key intent of this arrangement is that architecture will define and frame the public realm. Each new building must positively contribute to this objective. The best parts of great cities have a clear symbiotic relationship between architecture and the public realm of active boulevards, streets, lanes and city squares, beautiful parks and gardens, and a rich mix of activities to bring social, cultural and commercial vitality to city life.

Development guidelines for each superlot are outlined in Document C – Greater Curtin Delivering the Vision.



INTEGRATED LANDSCAPE

Landscape is an integral element in the master plan. The retention and augmentation of existing trees, sporting fields and passive open space is a fundamental strategy in the master plan's structure. The Living Stream is a unique feature of the landscape design as illustrated in the diagram opposite. It simultaneously supports and enhances cultural, recreational, educational, aesthetic and environmental value and experiences. The Living Stream will be an important asset to Greater Curtin and all new developments that abut the Stream will be required to imaginatively engage with this key structuring landscape element.

Greater Curtin is to be a green, low-carbon city. New building designs will be required to fully integrate landscape into development. This requirement may take the form of gardens, tree-lined courtyards, elevated terraces and landscaped roofscapes. Innovation in the integration of landscape into and around buildings will be encouraged.

The urban form and character of Greater Curtin will be realised through the application, and creative and positive response to specific policies, design controls and guidelines. These are provided in Document C – Greater Curtin Delivering the Vision. These guidelines allow a limited degree of interpretation to encourage and respond to specific conditions that might arise for individual development proposals, and to encourage variety.

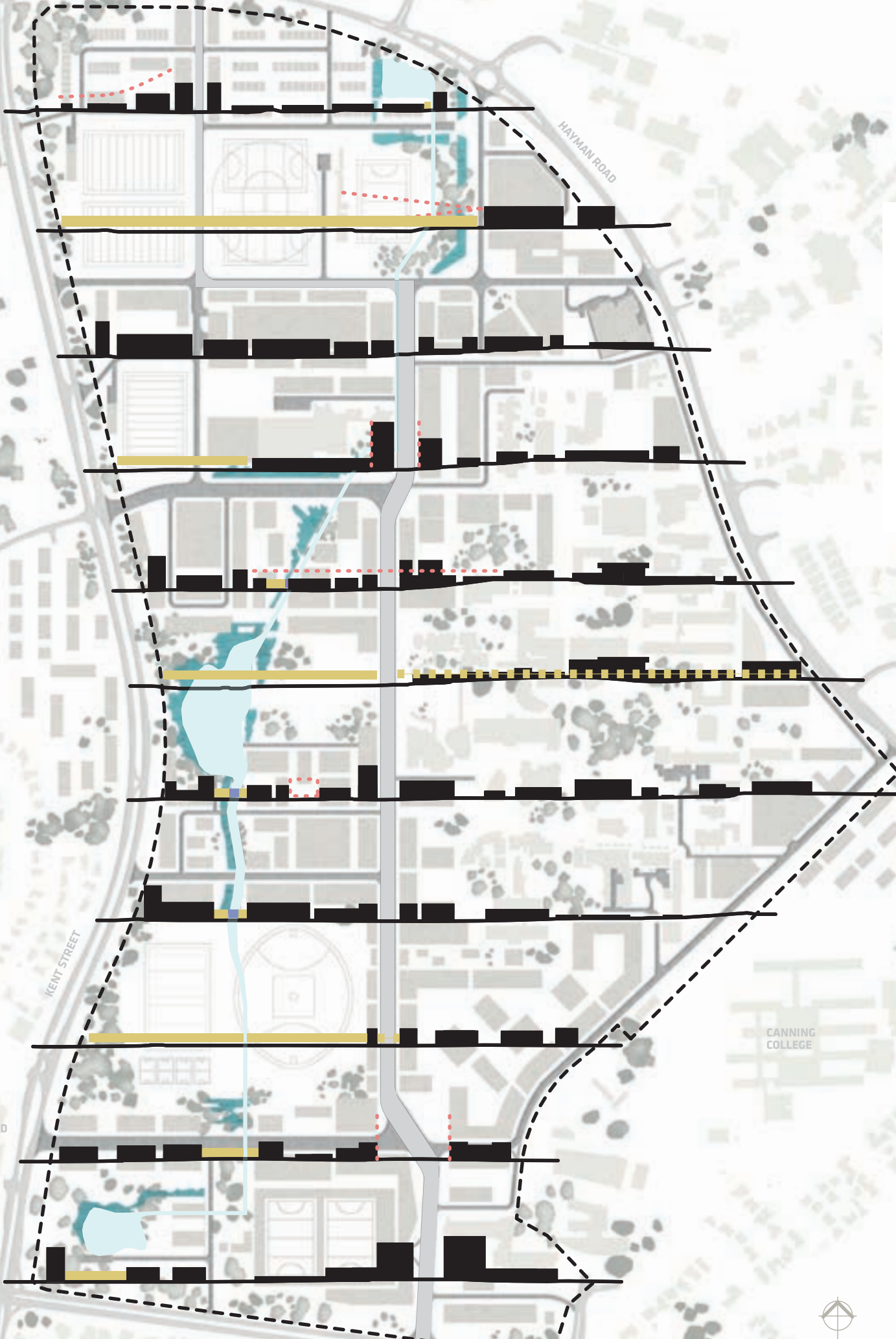
HAYMAN ROAD

KENT STREET

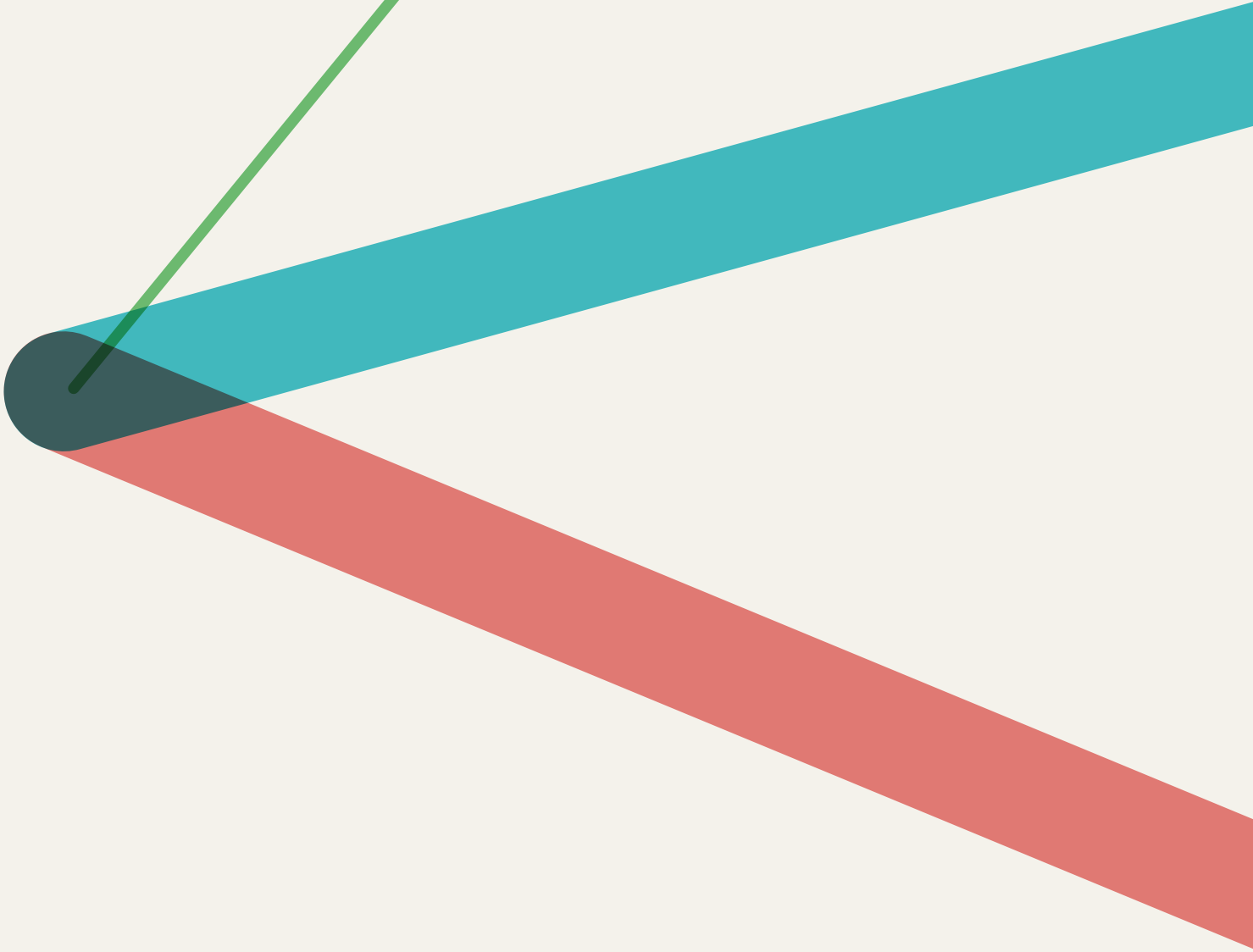
WATERFORD
PLAZA

CANNING
COLLEGE

MANNING ROAD



5.0 NEXT STEPS





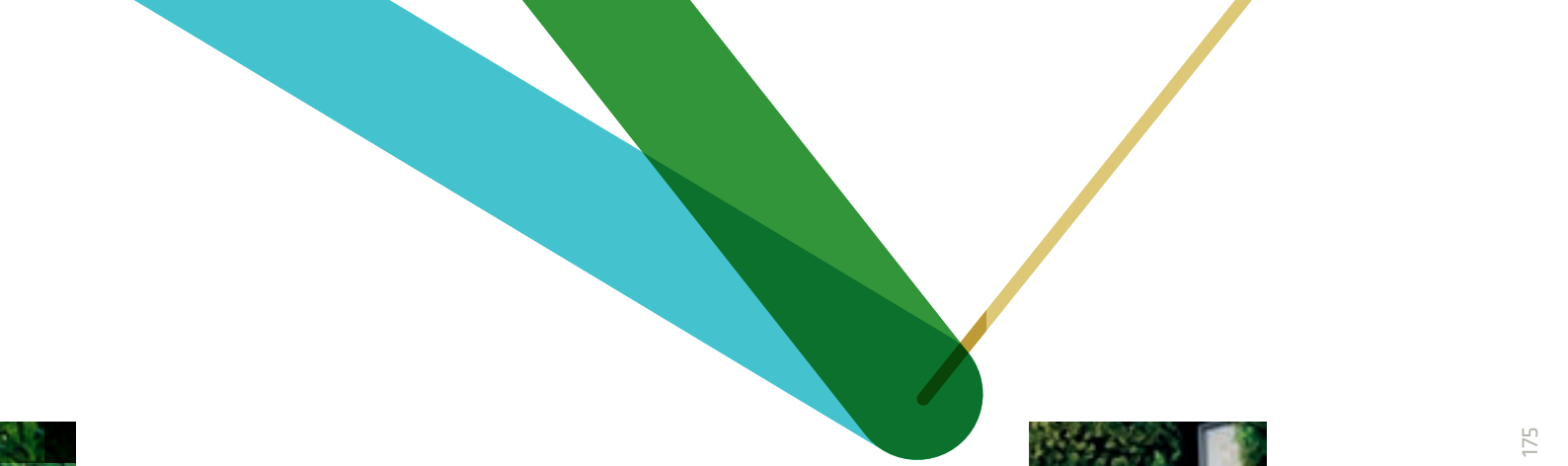
This document establishes a vision and spatial strategies to guide the transformation of the current university campus into a major node of activity, a ‘Greater Curtin’ over the next 20 years. It sets in place a flexible framework that the University and its partners can work with to establish an urban centre with:

- A strong identity based on the university’s existing knowledge centres and research capabilities
- High levels of vitality
- Community interaction
- Opportunities for growth, prosperity and strong partnerships.

The Greater Curtin Master Plan provides:

- A transformative vision to engage potential partners, change perceptions of the campus and set direction for the establishment of Greater Curtin
- A series of instructions, initiatives and strategies that set parameters and guidelines for detail development and provide the foundations to ensure project opportunities and initiatives build toward delivering the master plan vision
- A clear and agreed development plan consistent with the State Government’s Directions 2031 and Beyond vision.





The master plan is an evidence-based, market opportunity driven proposition through which Curtin University can, by developing and releasing land, make a significant contribution to the economic development of Perth and Western Australia, as well as achieve its own academic vision:

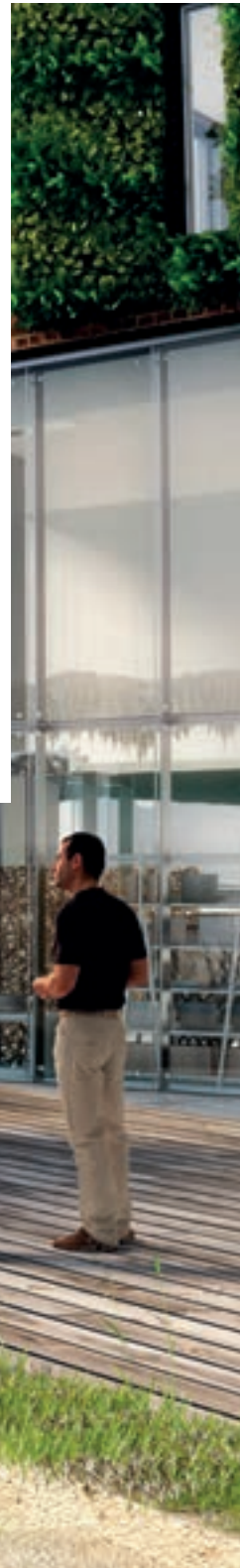
“To be an international leader in research and education – changing minds, changing lives and changing the world.”

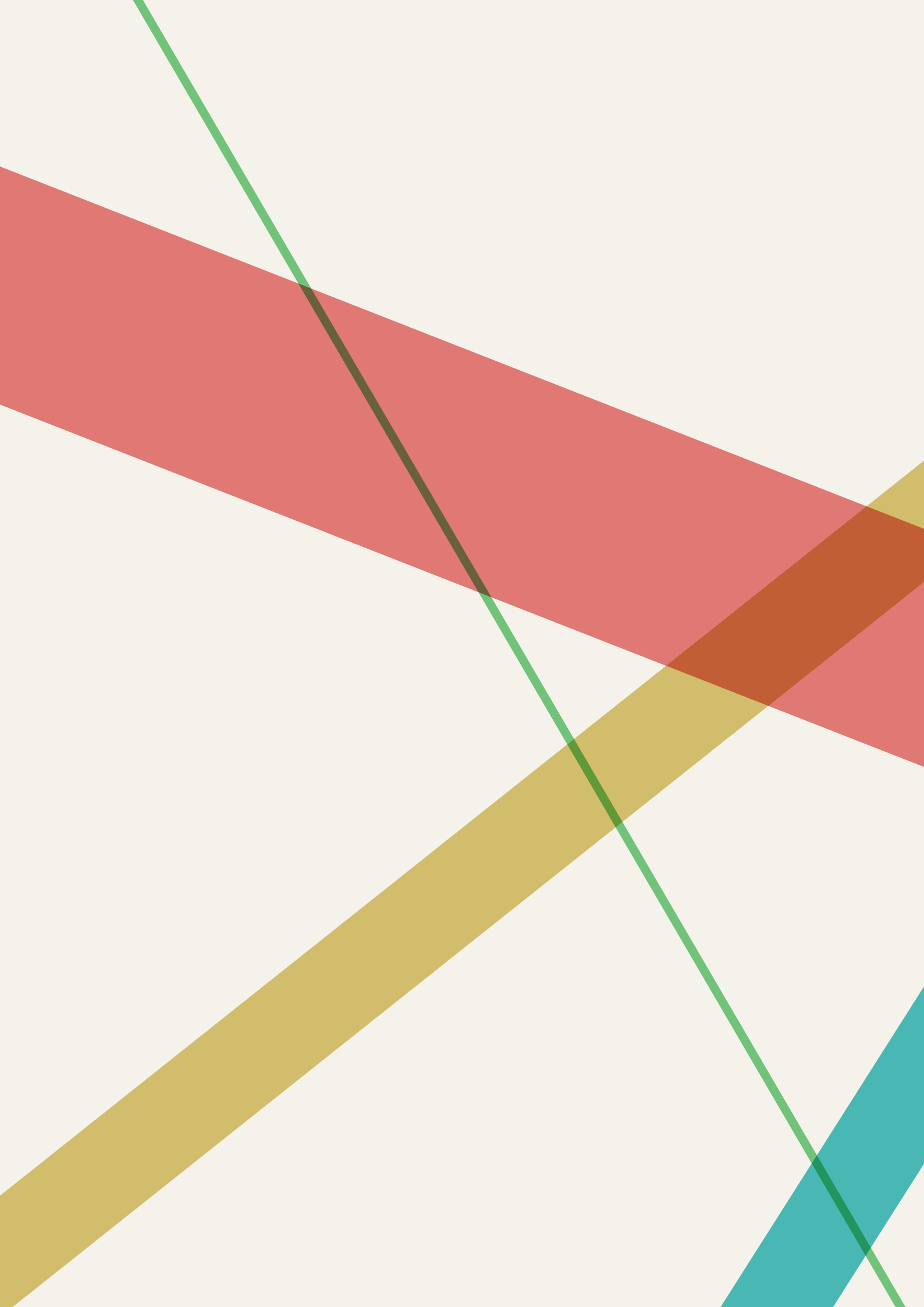
The master plan catalyses demand by broadening the appeal of the land to a wide range of property markets. Well-defined and consolidated development fronts will allow for a strategic approach to land development at Greater Curtin. The Master Plan sets in place a framework for development that will enable the transformation of the campus into an asset that responds to partnership opportunities and is able to influence development to set benchmarks for quality.

The strategies embedded within the master plan utilise the opportunity presented by Curtin University’s stewardship of the entire campus as an asset and provides:

- Diversity of activity to foster vitality and catalyse synergies between business and academia, research and practice
- Innovative and integrated district-level energy, waste and water infrastructure
- Highly connected movement networks that prioritise people over cars
- High quality built form and distinctive public realm and landscape.

Further detail outlining parameters for the development of lots in Greater Curtin are outlined in Document C – Greater Curtin Delivering the Vision.









**GREATER
CURTIN**

© Curtin University 2014

Except as permitted by the *Copyright Act 1968*, this material may not be reproduced, stored or transmitted without the permission of the copyright owner. All enquiries must be directed to Curtin University.



Curtin University