



RIVERSIDE WAGGA WAGGA

Prepared by:

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Prepared for:

 **City of
Wagga Wagga**



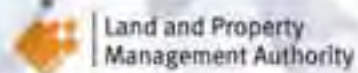
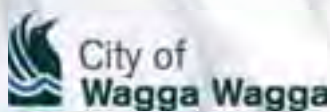
**Land and Property
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STRATEGIC MASTER PLAN

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PREPARED BY:



Ian Lawrence



Hill PDA

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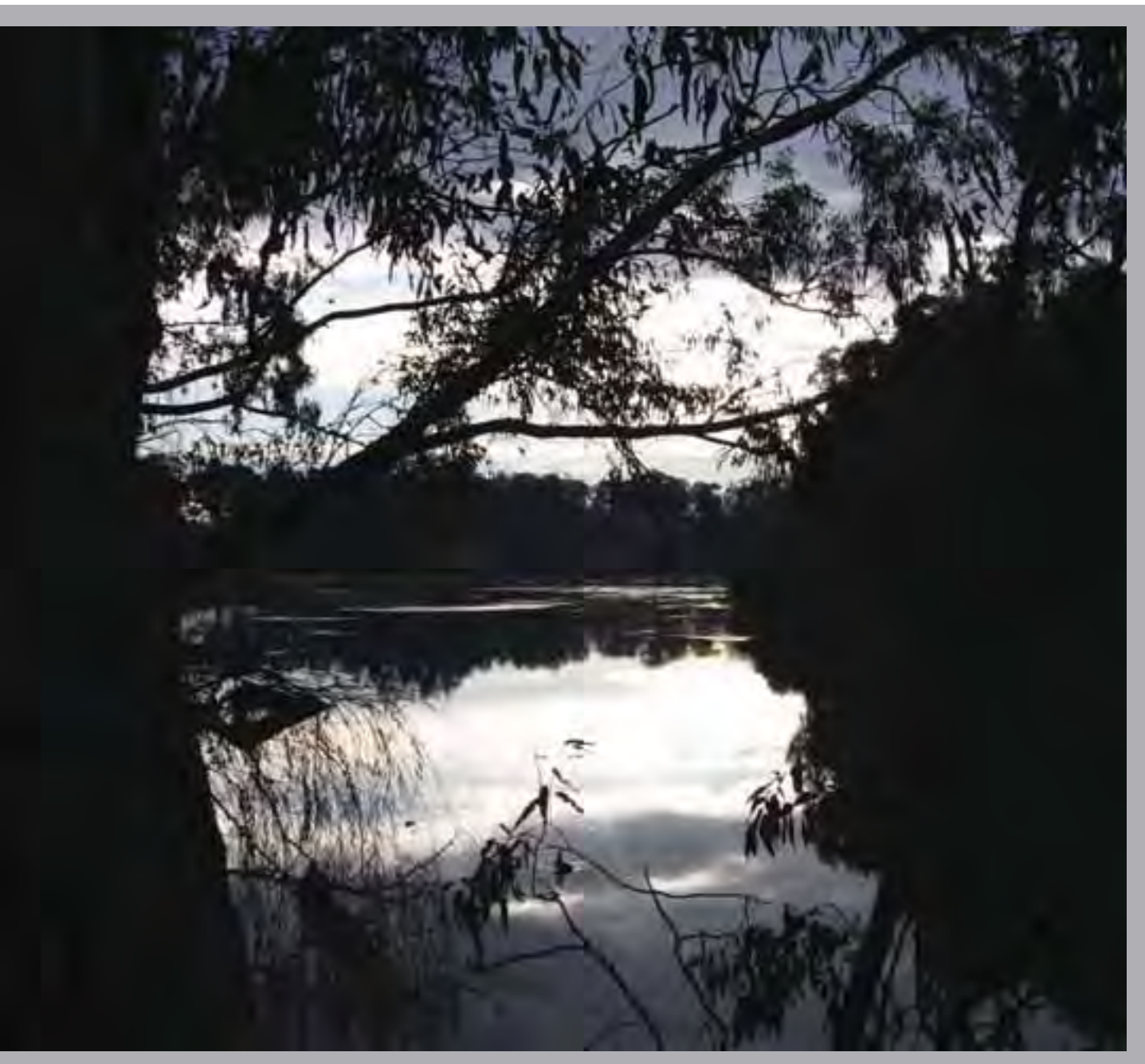
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Appendix B: Infrastructure Investigations (Aurecon)
Appendix C: Preliminary Market Assessment (Hill PDA)
Appendix D: Flood Protection Investigations (Ian Lawrence)



INTRODUCTION

PROJECT DESCRIPTION

Riverside Wagga Wagga is a visionary project that will reinforce the relationship between the iconic Murrumbidgee River and the city of Wagga Wagga by bringing an array of recreational, cultural, commercial and residential development underpinned by sustainable principles to fully showcase its potential and enhance the quality of living for its citizens and visitors alike.

The project has the potential to enliven the riverside but also to return the riverside back to Wagga Wagga. This natural resource with its unique riverine setting is a major asset for the city which is currently under-utilised. The Strategic Master Plan sets out a vision to fully capitalise on this potential.

Riverside Wagga Wagga is a partnership project between Wagga Wagga City Council and the Land and Property Management Authority (formerly NSW Department of Lands). Riverside Wagga Wagga is considered a catalytic project for the economic and cultural development of the city. A key aspect of the project is to re-focus the city towards the Murrumbidgee River – a fundamental environmental asset. Wagga Wagga is the largest inland city in NSW and is located in Wiradjuri country.

PROJECT RELEVANCE

The Master Plan is to be considered as a strategic document that sets out a vision for Riverside Wagga Wagga without necessarily specifying timelines or specific budgets. The aim of the Master Plan is to provide a long term vision that guides the future development and interface of Wagga Wagga with the Riverside.

This vision document is a critical reference for Council to ensure that its long term implementation is possible. In this regard it is seen as a framework from which specific components can be implemented as funding or other opportunities become available. Detailed costing of its recommendations will be developed with consideration to funding partnership with the private sector and pursuit of State and Commonwealth grants.

PROJECT OBJECTIVES

The project aims at connecting nature and culture, revitalising local identity and communities as part of an overall rejuvenation for the city.

- To develop the area as a focal point and destination for residents and visitors inclusive of community gathering points and creation of a sense of place.
- To be representative of world class, iconic design that incorporates ecologically sustainable design throughout.
- To enhance the existing passive recreation facilities to encourage healthy communities and liveability.
- To incorporate appropriate commercial and residential uses.
- To improve and create linkages to the city's CBD and existing cultural / civic precinct and integration with existing and future plans.
- To preserve and interpret the area's rich cultural heritage.

- To create a safe place for residents and visitors to interact.
- To apply Environmentally Sustainable Design (ESD) principles. (objectives from the Project Specification)

SCOPE

The project is divided into two parts: First a Strategic Master Plan for the whole site has been developed which provides a framework for the overall development of the site and informs the development of detailed areas. Part two comprises the development of detailed areas which provides more specific information regarding the Master Plan.

The Master Plan should be reflective of the above mentioned objectives and should consider the following:

- Existing and proposed infrastructure and utilities location and capability.
- Ecologically sustainable development principles.
- Consideration of flooding.
- Economic viability.

THE TEAM

The project has been awarded to Kiah Infranet as lead consultant and supported by David Lock Associates, Ian Lawrence, Hill PDA and Aurecon. Each team member brings specialist skills all relevant to the resolution of this strategic Master Plan.

Kiah Infranet has led the project as strategic planners / integrated urban designers and landscape architects, supported by David Lock Associates focusing on movement and transport, built form and land uses. Ian Lawrence has provided critical input into flooding, geomorphology and water sensitive design whilst Aurecon has been responsible for traffic management issues and infrastructure assessment. Finally, Hill PDA has provided an economic assessment to inform the Master Plan.



STRUCTURE OF THE REPORT

This report includes the following sections:

2 VISION:

- Approach.
- The Story of Riverside Wagga Wagga.

3 SITE ANALYSIS

The Site Analysis has been separated into "Riverside Context"- i.e. the macro scale; and "Riverside Precincts"- i.e. the precinct, micro scale.

Background information, reports, desk top analysis as well as site review have informed the macro scale; with more detailed on-site inspections informing the micro / precinct scale analysis. For the larger "Riverside Context", the analysis includes mapping and text relating to the following themes:

- Land use & activity
- Environment-natural and cultural
- Visual & Spatial
- Landscape and Built Form
- Movement & Transport

For the "Riverside Precincts" scale, opportunities and constraints relating more to urban and landscape design issues have informed the mapping and corresponding text. From both macro and micro analysis, key site planning principles and guidelines have informed the Strategic Framework.

4 STRATEGIC FRAMEWORK

From the analysis of the main contextual site opportunities and constraints, especially relating to the topography, geomorphology and river systems, flood protection, movement and land use, the key framework plans for the Master Plan evolved. They include:

- Riverside Regeneration
- Landscape Management Zones
- Land Use Opportunities
- Built Form Opportunities
- Movement and Access Opportunities

5 STRATEGIC MASTER PLAN

A Strategic Master Plan that integrates planning, design and economic feasibility has developed from this process and is supported by principles, guidelines and themes.

The Aurecon and Hill PDA reports inform this plan through their detailed assessments of Traffic Analysis Management and Market Assessment respectively.

6 PRECINCT MASTER PLANS

This section of the report outlines the precinct principles and guidelines in more detail and illustrates the concepts with plans, sections and other illustrative material.

The precincts are:

- Wiradjuri and Wilks Reserves.
- Hampden Terraces.
- The Bend.

6 MAKING RIVERSIDE A REALITY

Without economic feasibility and careful planning for staging and funding, the Master Plan would not evolve. Hence this section details the order and phasing of the development of the Strategic Master Plan recommendations and includes possible funding sources from both Federal and State Governments, as well as private sector possibilities.

7 APPENDICES

Within this section are the detailed reports on Market Assessment (HillPDA) and Traffic Analysis (Aurecon) as well as the preliminary concept plans that were presented at the Riverside Community Brainstorm, in August 2009.

It also includes more detailed background on flooding calculations, River bank stability etc.



APPROACH

The approach brought in developing this Master Plan is based on five principles:

COLLABORATIVE WORKING

To work in collaboration with stakeholders on projects of this nature with the aim to generate a close working relationship with the client, other consultants and key stakeholders. To pool the knowledge and expertise of the key participants in a series of informal but intensive workshops. There is no monopoly on good ideas, and this method allows an efficient and thorough transfer of vision, ideas, concerns and aspirations to the design team.

There are two main benefits of this approach. First, a comprehensive knowledge is gained of the area's existing characteristics and the aspirations of the key players, in turn ensuring a comprehensive solution. Secondly, a shared vision is fostered, as concepts are developed, tested and refined collaboratively. This creates a sense of ownership or pride in the outcome, cultivating commitment in its implementation and avoiding the potential for later misunderstanding or disagreement. It also harnesses community enthusiasm, generating momentum to carry the project forward.

The systematic approach to site and community analysis and the synthesis of each site's opportunities and constraints ensures a comprehensive interdisciplinary analysis. This comprehensive approach improves the overall design quality and project performance and functionality. By working in multidisciplinary teams and balancing economic, social and environmental values, sensible and innovative solutions can be achieved that respond to the synthesis of the opportunities and constraints of the land, the client and the community.

INTEGRATED URBAN PLANNING

The continued well being of an urban area relies on the successful performance of its primary functions - such as how well it meets the demand for services and provides easy access to them for all travel modes. This performance relies on complex inter-relationships between patterns of movement, land uses, economic values, built form, ecological systems and human aspirations.

Many of the problems that exist in urban areas today have resulted from the narrow consideration of the design of each of these elements. The urban design approach is to integrate the consideration of all of these issues, to ensure that their inter-relationships are understood. The creation of the Master Plan will illustrate integrated thinking making Riverside greater than the sum of its parts. Previous consultation has highlighted and proposed preferred and potential land uses.

This information along with the team's interpretation of the existing and proposed land use, landscape, ecological, social and economics of the spaces and places along the riverside and the existing city centre will enable the creation of an activity and movement framework. The location and the successful mix of new and existing uses is integral to the success of Riverside as a whole and the special places along it.

The development of responses and outcomes throughout the project will be based on the following six themes, which will ensure a structured and objective framework from which decisions can be constantly referred:

- movement and transport;
- land use and activity;
- environment;
- public space and spatial relationships;
- landscape / visual context; and
- built form.

PRACTICAL PLANNING

In order to ensure that strategies such as these are implementable, it is important to focus on practical visions and measures. This not only increases their likelihood of implementation, but also the likelihood of gaining and maintaining the confidence and support of the community.

In particular, the focus on cost effective solutions and function rather than purely aesthetic considerations needs to be taken into account. In addition, it is important to identify short-term initiatives capable of early implementation, to ensure the maintenance of the community's interest in and support for the project.

UNDERSTANDING SENSE OF PLACE

The team's approach is to create innovative, aesthetically pleasing designs with sustainable schemes that reflect the unique 'genius loci' of each site, ecologically and socially. Human health, social opportunity, cultural diversity, community identity and spiritual expression are all significantly influenced by the quality of our access to, and interaction with, the natural environment.

In order to develop an understanding of what can be done in a place, it is critical to understand that place, its ecological processes, its place in the psyche of local people, and its role in the fulfilment of cherished visions and the relationships between those factors. It is necessary to understand its intrinsic values not just as isolated qualities, but as inter-related factors that go together to make a place the place it is. The team will focus to identify this sense of place and, as far as possible, retain and enhance it whilst never losing sight of the big picture of strategic social, environmental and economic trends and needs to ensure the study finds solutions that are an appropriate local response to their global situation.

COMMITMENT TO SUSTAINABLE SOLUTIONS

There is a need to plan and design for climate change, and fully appreciate that to achieve sustainable planning and developments, a collaborative team integrating biological, earth, and social sciences along with engineering, anthropology and others, is essential. An integrated approach that balances economic, social and environmental values to deliver high quality solutions is critical.

Considerations for planning, design and management are essential. The resultant scheme must be self-maintaining in terms of the landscape, and the land use / cultural / social outcomes must be resilient to change in terms of socio-cultural and economic outcomes for future generations. Ultimately, the scheme should be flexible and adaptive. A sustainable approach to the overall planning and design of the project including considerations of ecological support patterns of development, inclusion of showcase water sensitive design, minimizing carbon footprints and sound community processes will assist in creating a balanced healthy environment, appropriate to the setting of Wagga Wagga.



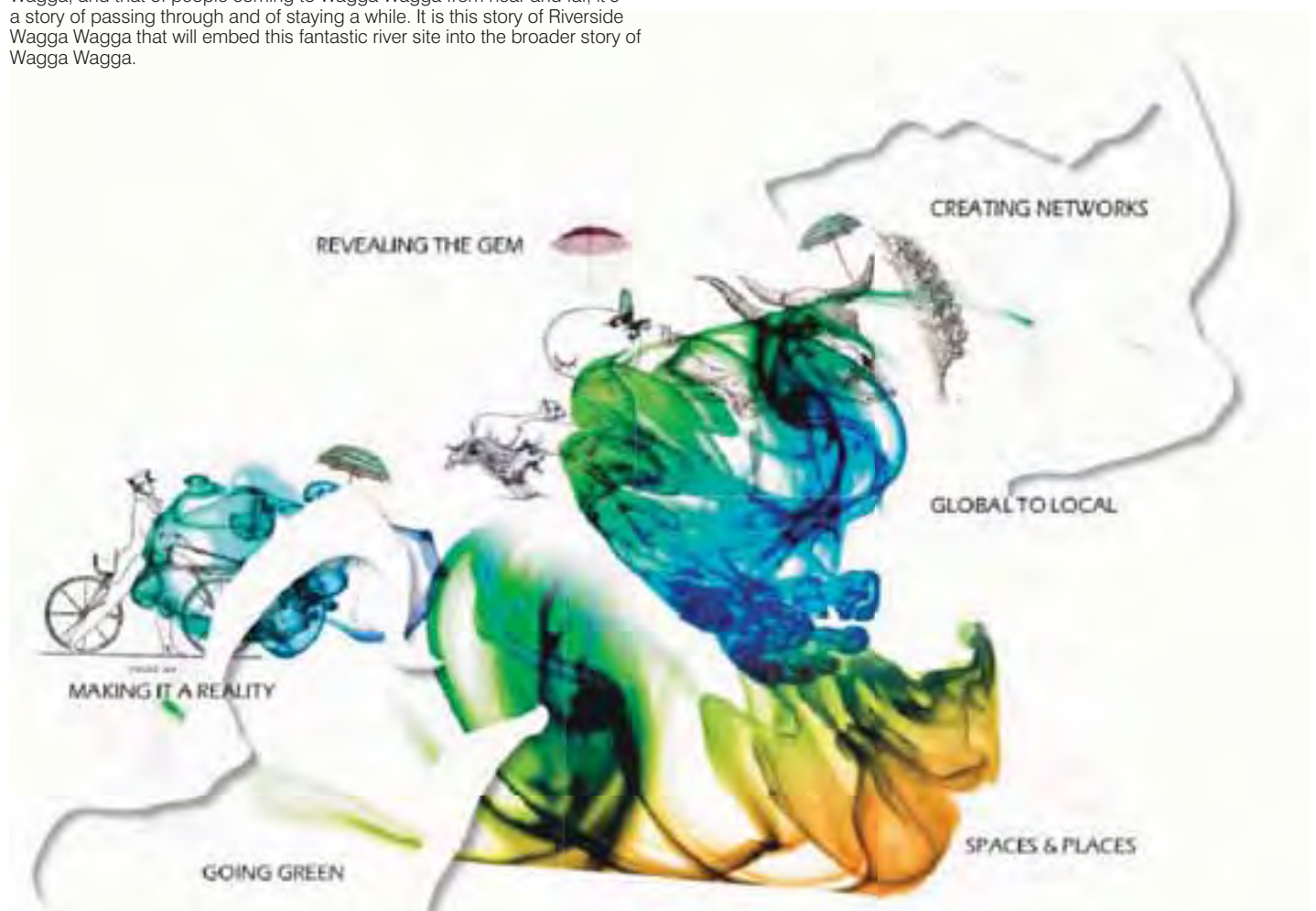
THE VISION

THE STORY OF RIVERSIDE WAGGA WAGGA

There are six themes presented below which collectively form the rationale for Riverside Wagga Wagga. The storyboard is described in six themes and reveals the key issues and approaches to the resolution of the project and tailor solutions to Wagga. The themes are:

- Global to Local.
- Revealing the Gem.
- Creating Networks.
- Spaces and Places.
- Going Green.
- Making it a reality.

The breadth of the story aims to fit in with the stories of Wagga Wagga and the region, of past, present and future. It is also a story of the people of Wagga Wagga, and that of people coming to Wagga Wagga from near and far, it's a story of passing through and of staying a while. It is this story of Riverside Wagga Wagga that will embed this fantastic river site into the broader story of Wagga Wagga.



Global to Local - A regional attractor

WHAT IS THE ISSUE?

- Wagga Wagga is a regional attractor in terms of commerce and the higher order services such as arts and entertainment.
- Wagga Wagga has a large transient population from the army and air force bases, self-contained travellers (SCT) and students, and in turn their visiting friends and family.
- With the fall of the lake water, the river is an alternative boating attractor.
- Charles Sturt University has a strong international reputation as an environmental research school.

WHY IS THIS AN ISSUE?

- The river is an asset for transient populations, providing an outdoor living space for visiting families and friends, and those passing through.
- There is the opportunity, in connecting the city to the riverside, for visitors to be enticed to stay longer or return more frequently to spend time with their loved ones.
- Any sustainable development should maximise competitively in a global economy and allow for efficient linkages with surrounding regional destinations.
- The self-contained travellers use the riverside to park and stay informally at Wilks Park.
- As a point of connection between the Murrumbidgee and a scientific research institution, the opportunity exists for a stronger link between Riverside and Charles Sturt University.

HOW TO REALISE THESE OPPORTUNITIES?

- Reflect the unique identity of Wagga Wagga as a riverside city by locating an iconic major community facility and entertainment attractor to visually and physically link the Church Precinct, Riverside and Civic Centre.
- Create a sustainable demonstration site lead by the University to cement Wagga Wagga's reputation for sustainable use of water.
- Enhance the lives of the transient population of Wagga Wagga by creating and improving riverside uses suitable for those who are part of the community for just a short time.

Revealing the Gem - Bringing the locals to the Riverside

WHAT IS THE ISSUE?

- Interaction between the city centre and river is limited as the city and its buildings turn their back to the river. Streetscape amenity does not promote visitation to the river.
- Paths to the river are obstructed by the levee, steep topography and vegetation, and roads are a partial barrier to pedestrian movement. The informality of the levee also makes it visually detached from the city.
- Large areas at the water's edge are occupied by functions unwelcoming to pedestrians including car parks and unattractive buildings, and outdated facilities that are unattractive.

WHY IS THIS AN ISSUE?

- The river is a key natural feature of the city's setting. Expressing this interface both naturally and culturally to draw people to the water's edge would strengthen the identity of Wagga Wagga, promote respect for the environment and enhance the esteem of its citizens towards the city.
- Waterside environments contribute to local people's lives in many ways, providing for passive and active play and recreation and spiritual enhancement. It can be a place to contemplate as well as a place to get fit and healthy.
- If locals are drawn to the river, others will follow.

HOW TO REALISE THESE OPPORTUNITIES?

- Break down fast and wide road barriers, discouraging through traffic between the Cross Street car park site and the Civic Centre to encourage easy pedestrian flow the riverside.
- Activate the zone between the city and river with integrated landscape, building and streetscape indicators designed to draw people to the riverside, with a central focus on a state of the art major community facility.
- Recognise and celebrate the levee as part of the city's structure and make use of the levee as a pedestrian route with places and spaces for the community. Make a feature of the levee as one of the few places from which you can look back over the city.
- Make the levee disappear in key locations, introducing softly transitioning levels, planting and terraces as meeting places gently cascading to street level.
- Relocate the Caravan park to a more appropriate location. The caravan park acts as a visual barrier and dissects the open space system along some of the most exposed and critical open space adjacent the river. These spaces should be consolidated to create a civic park type setting that benefits the whole of the community.



Creating Networks - Pearls on a string

WHAT IS THE ISSUE?

- The riverside is not celebrated and loved because the range of activities and uses that could be along its edge is not fully realised.
- The river can cater for recreational uses and environmental enhancement that would provide for the needs of the locals, visitors, the river system and the life along and in it.

WHY IS THIS AN ISSUE?

- Connected and accessible waterside spaces enhance the lives of those who live and work near the water as they go about their business.
- As part of an activated pedestrian and cycle network, a site comes alive at all hours of the day and all days of the week and year.
- Consideration of wildlife corridors is paramount to a sustainable system, and strengthens the value of the site as part of a sustainable future.

HOW TO REALISE THESE OPPORTUNITIES?

- Create a legible open space framework that incorporates road corridors, metropolitan open spaces, and ecological corridors to provide the site with a strong visual and functional structure.
- Establish destination points along the river to add interest and promote usage by people of all ages and people of a range of life stages and interests. This will also enhance safety.
- Distinguish between areas of stillness and movement to create a strong network of distinct places through diversity.
- Establish walking and cycling trails to link these precincts in a meaningful way, tapping into and strengthening existing networks of movement through the area.

Spaces and Places - A community united

WHAT IS THE ISSUE?

- There are many reasons to congregate alongside and celebrate the river, but places of quality and substance attractive to a range of people are lacking.
- Events and conferences are being turned away from Wagga Wagga due to the inadequacy of the facilities, cultural groups need a new and inviting place to be and sporting and community clubs and facilities are in need of an upgrade.
- The Visitors Information Centre needs to reflect the size of the city.
- Wagga Wagga's history is connected to that of the river and its landscapes, with unrealised potential for cultural connection.

WHY IS THIS AN ISSUE?

- The people of Wagga Wagga need to have a strong variety of places for different functions to congregate and celebrate by the river.
- Riverside Wagga Wagga needs to be able to fulfil this role in an exemplary manner providing spaces with different scales and functions.
- Any sustainable development should reinforce social cohesion, deliver quality and diversity and reinforce the character of place. Long term stewardship of the project relies on a broad and meaningful connection with a diverse range of people.

HOW TO REALISE THESE OPPORTUNITIES?

- Create a new tourism orientated front door for Wagga Wagga complementary to the church precinct overlooking the river. Integrate the visitors centre into cultural facilities linked to the existing civic precinct. This precinct can co-locate many arts and community functions identified as needing more space, a new place or an upgrade.
- Realise the potential for more people to live and work along the river, mixing housing with retail. Land-use change along and parallel to the levee could provide a great opportunity to introduce density and vibrancy to the CBD.
- Attract a range of people to the river through different avenues, utilising the unique quality of the meandering river to establish areas of distinct character in each of its bends.
- Incorporate multi-purpose spaces in a cohesive open space framework suitable for festivals, markets and other open air events. The Hampden Bridge offers a great congregation space that can act as a bridge plaza.
- Facilitate equitable distribution of access and services in an environment that provides shared access to public spaces and promotes healthy activities and engagement for all age groups, ensuring long term sustainability through ownership.
- Establish interpretive trails articulating physical and cultural landscapes linked to European, Indigenous, Chinese and flood heritage.
- Introduce interpretation places and places to celebrate the indigenous life of the river.



Going Green - Confronting the big issues

WHAT IS THE ISSUE?

- We are faced with big environmental challenges, the solutions for which need to be confronted at a local level.
- The challenges of global warming and declining water supply raise exciting opportunities for communities.
- There is unrealised potential for the creation of sustainable solutions within Wagga Wagga.

WHY IS THIS AN ISSUE?

- The people of Wagga Wagga need somewhere to research and embrace new environmental solutions.
- The interface between a river and a city provides a great opportunity to bring solutions to life, creating interest, ownership and environmental stewardship.
- Any sustainable development should plan for the future with clear goals and priorities and adopt an integrative strategy that reconciles economic, social and environmental objectives.

HOW TO REALISE THESE OPPORTUNITIES?

- Provide a strategic plan for sustainability that supports economic prosperity, social responsibility and environmental stewardship.
- Create a focal point for community and institutional environmental research and interpretation, investigating opportunities for connections with the centres of environmental excellence allied to Charles Sturt University.
- Facilitate energy efficient transport and connectivity, developing pedestrian and cycle networks that are user friendly and minimise conflicts with other modes of transport.
- Promote ecological systems, rather than patterns on the ground.
- Encourage efficient use of materials evaluating life-cycle costs and on going maintenance to minimise post construction carbon footprints.

Making it a Reality - A community empowered

WHAT IS THE ISSUE?

- The Riverside site constitutes a beautiful environment, the economic capacity of which is not currently being harnessed.
- There is currently insufficient funding in place to support the full realisation of the Master Plan.
- Any comprehensive development on the site is under considerable threat of flood damage.

WHY IS THIS AN ISSUE?

- For Riverside Wagga Wagga to be successful and sustainable into the future, appropriate revenue and support will be required.
- Any design or development will have to be mindful of flood risk.

HOW TO WE REALISE THESE OPPORTUNITIES?

- Realise the potential for more people to live and work along the river, mixing housing with retail.
- Capitalise on views to the river from higher ground, where property can be protected from flood, such as a café or restaurant accessible from atop the levee.
- Focus on simple structures considerate of flood risk to minimise risk of flood damage where structures are required near the river.
- Identify opportunities for significant development sites within Riverside to generate revenue.
- Locate small kiosk points for commercial activity associated with recreation such as kayak, bicycle, boat or other equipment hire and investigate commercial opportunities for increased activity on the water.
- Establish a location for night time activities such as moonlight cinema or other open air concerts or festivals.
- Incorporate self-managing landscapes to keep maintenance costs down and to reflect sustainable landscape management practice.
- Realise synergies between groups and funding opportunities by bringing community groups together and recognise cultural capital.
- Establish a Riverside Friends group of interested citizens to aid with planting, construction and regeneration of the natural landscape linked to education and community service.
- Focus on low cost attractants where possible.



RIVERSIDE CONTEXT

GENERAL

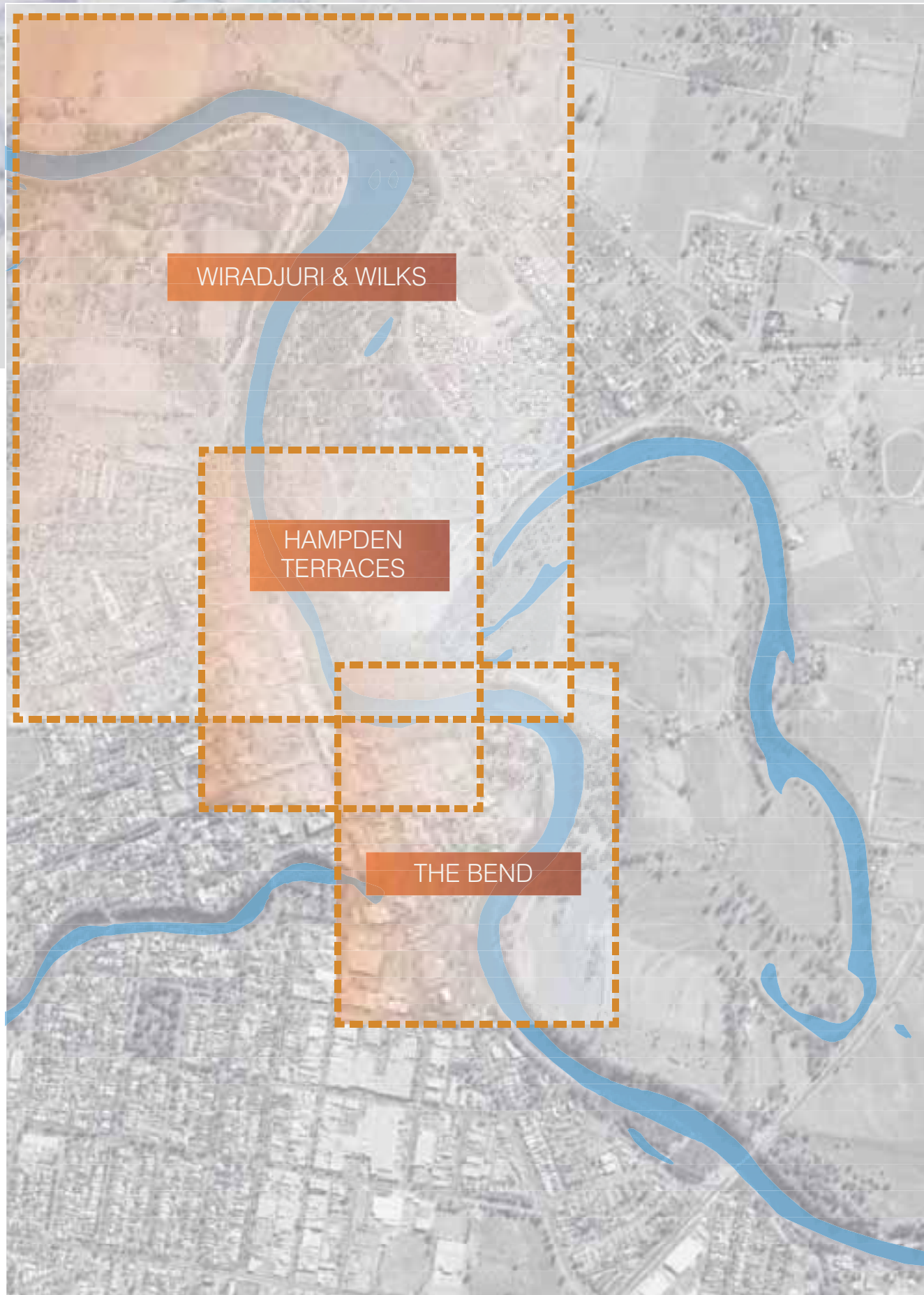
Wagga Wagga is the largest inland city in NSW with over 58,000 residents and offers an array of services in the sectors of education, manufacturing, health, research and other professional services and commercial operations. The city also houses Charles Sturt University and two defence establishments which are major contributors to the economy.

The Murrumbidgee River as a key natural feature defines the eastern border of the city centre. Farmlands and foodplains define the other side of the river creating a unique interface between the urban areas and the city centre. Exploiting this situation is considered critical to reinforce the unique qualities of Wagga Wagga.

The riverine floodplains offer a valuable asset to the community as an extensive open space system with a significant potential for recreational uses. Due to flooding issues, a levee has been erected to protect the city which unfortunately acts as a physical barrier between the urban areas and the river.

This barrier is considered a key element to the resolution of the Master Plan and strategies will be investigated to make the levee visually disappear wherever possible.

Regarding urban interfaces, the Master Plan precinct interfaces with three distinct areas. To the south is the Civic Centre which includes the Council premises, the Civic Theatre, the Visitor Information Centre, Wollundry Lagoon and the Old Gas Works site (currently a car park facility). At centre is the Church precinct with its numerous churches and institutional buildings. To the north is the interface of commercial, industrial and residential buildings between Fitzmaurice Street and Cadell Place. Each of these areas have distinct issues relating to their interfaces with the river.

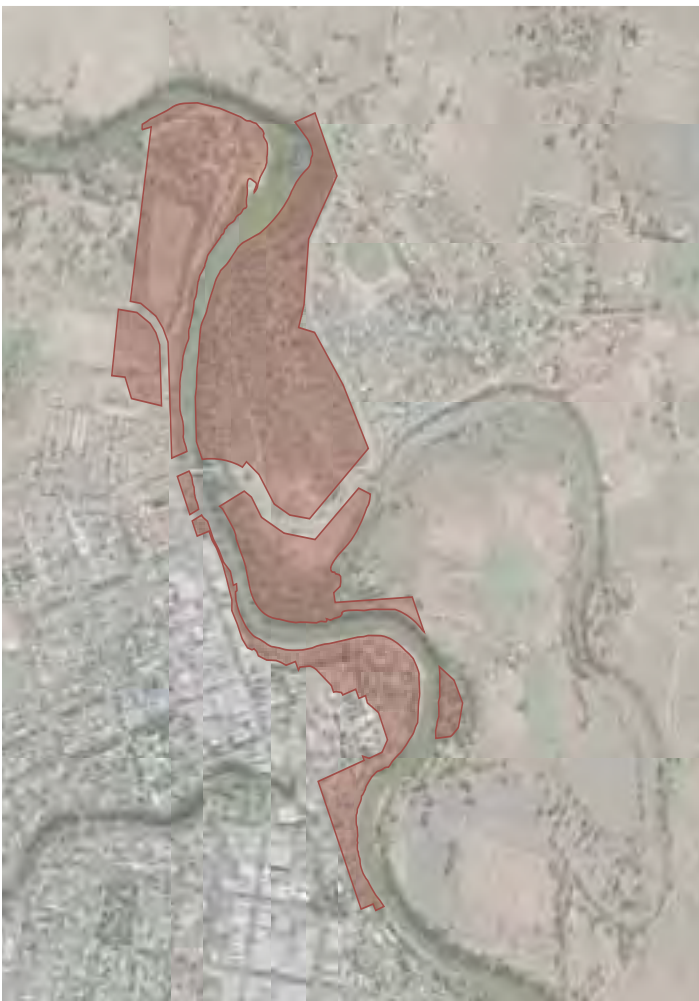


local context
Identification of Precincts



CONTEXT & PRECINCTS

The area of the Master Plan extends from Wiradjuri Reserve in the north through Wilks Park down to Thompson Street in the south. Three specific precincts have been identified within the Master Plan area; Wiradjuri and Wilks comprising the northern and more natural areas, Hampden Terraces defining the northern gateway and The Bend which includes high profile areas such as the Civic Precinct and Wagga Beach.



Above: Diagram illustrating the Master Plan project boundaries



WIRADJURI / WILKS PRECINCT

- 01 Aerial view looking south from above Wiradjuri Reserve
- 02 Wiradjuri Reserve showing the myriad of 4WD tracks
- 03 Informal camping at Wiradjuri reserve
- 04 Informal BMX track in Wilks Park
- 05 Dry conditions looking across the open space at Wilks Park
- 06 4WD tracks at Wiradjuri Reserve
- 07 Picturesque views across the river from Wiradjuri Reserve to Wilks Park
- 08 Ephemeral wetland in Wilks Park



The precinct of Wiradjuri and Wilks is composed of two distinct areas on each side of the river. They define the northern end of the project and are in natural settings. Both sites are located within the floodplain and hence provide limited opportunity for development.

Both sites have been partially disturbed by recreational vehicles, particularly Wiradjuri Reserve which is considered the more sensitive area due to its scenic and visual beauty, with its direct visual contact with the river, and the physical relationship of the bend in the river to the park setting. Wilks Park comparatively has more secluded relationships with the river, due to the predominance of steep banks to the river and abundant vegetation within the river corridor. Within Wilks Park there is an abundance of areas of high conservation value.

Towards the south of Wilks Park, large open spaces dominate the setting which are currently used as informal sites for self-contained travellers. This area has an outdated public facility block.

The northern end of Wilks Park provides a high quality visual setting with floodplain riverlets and extensive mature vegetation.

Further description of existing conditions is contained later in the report, under Section 07, Precinct Master Plans.

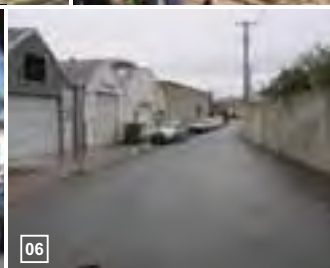


Above: Existing vegetation in Wiradjuri Reserve offers significant visual character and should be retained and protected



HAMPDEN TERRACES PRECINCT

- 01 Lower river terrace from levee at Sturt St
- 02 Lower terrace open space
- 03 Levee walk adjacent to Sturt Street access
- 04 Hampden Bridge - under repair
- 05 Carpark lot giving access to the levee
- 06 Cadell Lane showing current relationship to the levee wall
- 07 Cadell Lane and the levee wall
- 08 Empty lot behind Romano's - currently utilised as informal parking
- 09 Shared cycle / pedestrian track to edge of levee



Hampden Terraces Precinct is an urban zone interfacing with the river. A key landmark feature is the historic Hampden Bridge built in 1895. The Bridge is a modified Allan truss and is recognised as a technically significant structure.

The Bridge is valued by residents for its historical connections to the development of Wagga Wagga City and for its contribution to the setting of the Murrumbidgee River at Wagga Wagga. Furthermore, Hampden Bridge is one of only three overhead braced Allan truss bridges that remain in NSW. Hence its historical significance is considerable.

Key issues with the bridge today is its upkeep and maintenance costs which question its retention.

South of the bridge the urban zone interfacing with the river is predominantly of a light industrial character composed of sheds and warehouse type buildings. A concrete wall acts as the levee creating a visual barrier between the urban fabric and the river dissecting the two areas.

In this area the river is in close proximity with the built form and as a result steep batters are characteristic. These batters are threatened by erosion and are largely inaccessible for maintenance.



Above: View towards the historic Hampden Bridge with the Wiradjuri Bridge in the foreground



THE BEND PRECINCT

- 01 Aerial view back over the beach with church precinct in behind
- 02 Playhouse Theatre with church in background
- 03 Levee walk south of Visitor Information Centre
- 04 View south of Murrumbidgee River from "the rocks" access point
- 05 Caravan Park as viewed from across the river
- 06 Current parking space adjacent to the beach
- 07 Current parking space at Old Gas Works site
- 08 Wagga Beach
- 09 Bidgee Canoe Club at the beach
- 10 Levee bank stabilisation near the Visitor Information Centre
- 11 The Beach - showing new planting works
- 12 Under utilised open space adjacent to the Caravan Park



The Bend Precinct encompasses some of the more significant interfaces between the city centre and the river. This area includes Wagga Beach which has historic significance, has now a somewhat compromised site character and entrance and is in need of enhancement to further strengthen its historic role as one of the city's key focal points and access to the river.

This precinct also includes the church precinct situated on a prominent granite knoll 'forcing' the river around it creating thus the bend in the river. The various spires of the churches in this area add character to the urban scape of the city and could be consider iconic for Wagga Wagga due to their tight grouping in a small area.

The Civic Centre is located towards the southern end of the precinct and interfaces Wollundry Lagoon and Baylis / Fitzmaurice Street. A large car park visually dominates the setting east of the centre detracting from the riverscape.

Along the banks of the river key issues include erosion on both sides.



Above: Overview of the Bend Precinct with Church Hill in the foreground



natural environment
Topography, Drainage and Slopes



NATURAL ENVIRONMENT - Topography

Topography & Elevation

Wagga Wagga is situated on the flood plain of the Murrumbidgee River and is relatively flat. The city occupies the highest part of the site, to the west of the river, with one main ridgeline forming the divider in the city - the "Sand Ridge".

To the east and north the topography is part of the lower floodplain area where slopes are relatively flat. Key topographical elements include;

- the major ridge through the centre of the CBD- the sand hill on Fitzmaurice Street (Hunter's Hill);
- the prominent knoll on the southwest of "The Bend" in the river- i.e. Church Hill; and
- the extensive lower floodplain areas to the east and north of the city.

Steep Banks

Many of the River banks are steep, eroding and being undercut in places. These steep batters restrict visual and physical access to the river and require stabilisation; Council has an on-going program to improve stability of the river banks, especially in the first 4-5 vertical metres of the bank - i.e. within the most erodible zone for flooding. As part of the analysis for this Master Plan process, visual access to the river has been assessed, in conjunction with opportunities to reduce the steepness of the river bank slopes.



Above: Typical steep banks to the river - northern section of The Bend of the river, where mature trees are falling into the river due to eroding and under-cutting of the banks.



Above: Low grassy floodplain north of The Bend in the river, Wilks Park.



Above: An example of the steep banks with large riprap boulders to the outside of bends.

NATURAL ENVIRONMENT - Soil Landscapes & Biodiversity

An essential part of the analysis phase for a project like this is to try to identify what the original “pre-white man” vegetation was of this area. A description in the “Ocean Shores to Desert Dunes” publication describes the vegetation west of Wagga Wagga as first observed by Charles Sturt during his expedition down the Murrumbidgee River in 1829, and much later, described in scientific detail by Charles Moore (Moore 1953). It notes that extensive areas of Floodplain Transition Woodlands that once occurred in the central and eastern Riverina between the Lachlan and Murray Rivers, and south into Central Victoria.

The Riverine forests present in Riverside tend to be distinct and in Wagga Wagga can be thought of as containing a single plant community, River Red Gum Forest. Between 60% – 85% of this community has been cleared or severely degraded and the Conservation Status of this community is Vulnerable (Priday and Mulvaney 2005).

Wiradjuri and Wilks Parks are on the Riverine flood plain and are in the River Red Gum Forest vegetation community (Priday and Mulvaney 2005). Key aspects include:

- *Eucalyptus camaldulensis* (River Red Gum) tall open forest dominates the riparian zone of major streams; and
- *Leptospermum* spp. – *Callistemon sieberi* dominated shrublands that occupy the banks of streams on river flats and on soils derived from fine-grained lithology on undulating hills.

There are also areas of grassy woodlands with a variety of herbs and sparse layer of emergent shrubs. Most of the original extent of these areas has disappeared through clearing and weed invasion. (J.S. Benson, Plant communities of the NSW Southwestern Slopes Bioregion)

Benson and the Murrumbidgee Catchment publications have documented the range of existing vegetation species; the Master Plan should reflect and reinforce the indigenous vegetation patterns, their species diversity and likely percentage ratios of tree cover to shrub cover to herbs and grasses. The design phases need to further define these in specific species and distributions across the various sites and precincts.

The figure opposite illustrates the surrounding context of the project area with respect to soil profiles. Within the area there are two soil profiles present; Farnham and Kurrajong Plain. (Source: Soil Landscapes of the Wagga Wagga 1:100,000 Sheet, Dept. Land & Water Conservation, 1996)

The Farnham soil profile occupies the area of the Murrumbidgee River's floodplain which is flooded annually and is characterised by the gently undulating topography of alluvial landforms including low levees, incised river channels, abandoned channels and extensive backplains. While most of the area has gentle slopes of <2%, relief is up to 10m on streambank cliffs and <1m in the backplain. The land has been extensively cleared with only small remnants of tall woodland to open-forest remaining. The dominant tree species is River Red Gum, with some Grey Box and Yellow Box also being present. The understorey contains Wallaby Grass, Spear Grass, Broome Grass, fescues, Barley Grass, Burr Medic and clovers. Most of the area is inundated during flood peaks for short periods during winter but the soil is otherwise dry to moderately moist. While the soil offers high fertility, limitations include annual flooding and associated erosion.

Kurrajong Plain soil profile occurs on the high floodplain of the Murrumbidgee River. The land is rarely flooded and has generally very gentle topography, with slopes of <1%. Apart from very small areas of tall woodland, the land is extensively cleared. Remnant species are as listed above for the Farnham soil profile, with the addition of White Box to the tree species. The soil holds some moisture during the cooler months and is dry throughout summer and early autumn. Waterlogging and streambank erosion occur in localised areas.



Above: Low lying grassland, Wilks Park.

Management

Efforts made to restore the riparian habitat of North Wagga are outlined in the 2006 report “*Restoring Core Riparian Habitat for Key Threatened Species in Wagga*”. In this report it is highlighted that the native grassy woodlands which occur in the area of Wilks Park are recognised as being “*one of the most threatened plant communities in southeastern NSW*” (Read, 2006) and are considered essential in mitigating major environmental issues in the catchment, such as salinity. The project described in the report aimed to re-establish the natural plant composition of the park by restoring communities of native grass groundcover and River Red Gum.

Council's approach has been not to thin dense regrowth of River Red Gums, and to retain the existing stands for ecological reasons and also cost reasons. It is noted that from a hydraulic roughness or flood flow friction loss perspective, widely separated round trunks will have a much lower impact than say dense undergrowth (understorey of acacia, shrubs, etc) that would establish with a more open canopy. However we understand that dense planting within these reserves will only have a minor impact on the overall flooding of the area, compared to other major issues such as the obstacles to flow around the Wiradjuri Bridge - North Wagga - Hillary St hill area. In light of this we support a balanced approach of ecological mixed layer plantings and more open areas, as shown in the Master Plan.

Tree and shrub species planted in revegetation included Silver Wattle, Golden Wattle, River Bottlebrush, River She-oak, Prickly Tea-tree, Wedge Leaf Hop, Silver Cassia and Silver Banksia. Native grass and herb species included Wallaby Grass, Common Wheat Grass, Kangaroo Grass, Red Grass, Curly Windmill Grass, Weeping Grass, Spear Grass and Creeping Saltbush. Willow and Privet along with several grass species are the weeds present. Control measures are being undertaken to control these plants.

Soil considerations

The Soil Landscape Series Sheet 8327 (Department of Soil and Landscape Sheets, 1:100,000 Series) identifies soils of the river floodplain and city area north of the Sturt Highway as Kurrajong Plain Landscape soils – Eutrophic brown Dermosols and Kandosols – Brown clay alluvial soils of 0.8 to 1.5 m depth.



Alluvial material extends well beyond the 1.5 m soil depth identified on the Soil Landscape Series Sheet (up to 12 m depth).

The soils on the south side of the Sturt Highway are identified as Redback Landscape soils – Eutrophic brown Chromosols – Brown Piedmont slope derived solonised brown earths. They are highly erodible, sodic (high sodium – dispersible) soils.

It is concluded that the soils north of the Sturt Highway are suitable for application of WSUD measures.



Above: River Red Gums, along the riparian zone, northeast section of the Murrumbidgee River



Above: Healthy regeneration within riparian zone, Wilks Park.



Above: Mature River Red Gums, within riparian zone, Wiradjuri Reserve.



Biodiversity

The following information was provided by D.Read, Wagga Wagga City Council:

The mapping of biodiversity has been adopted from the 2008 LEP. Key aspects to the site are areas of native grassy woodlands through Wilks Park, and the area west of Wiradjuri that should be protected in the strategic planning.

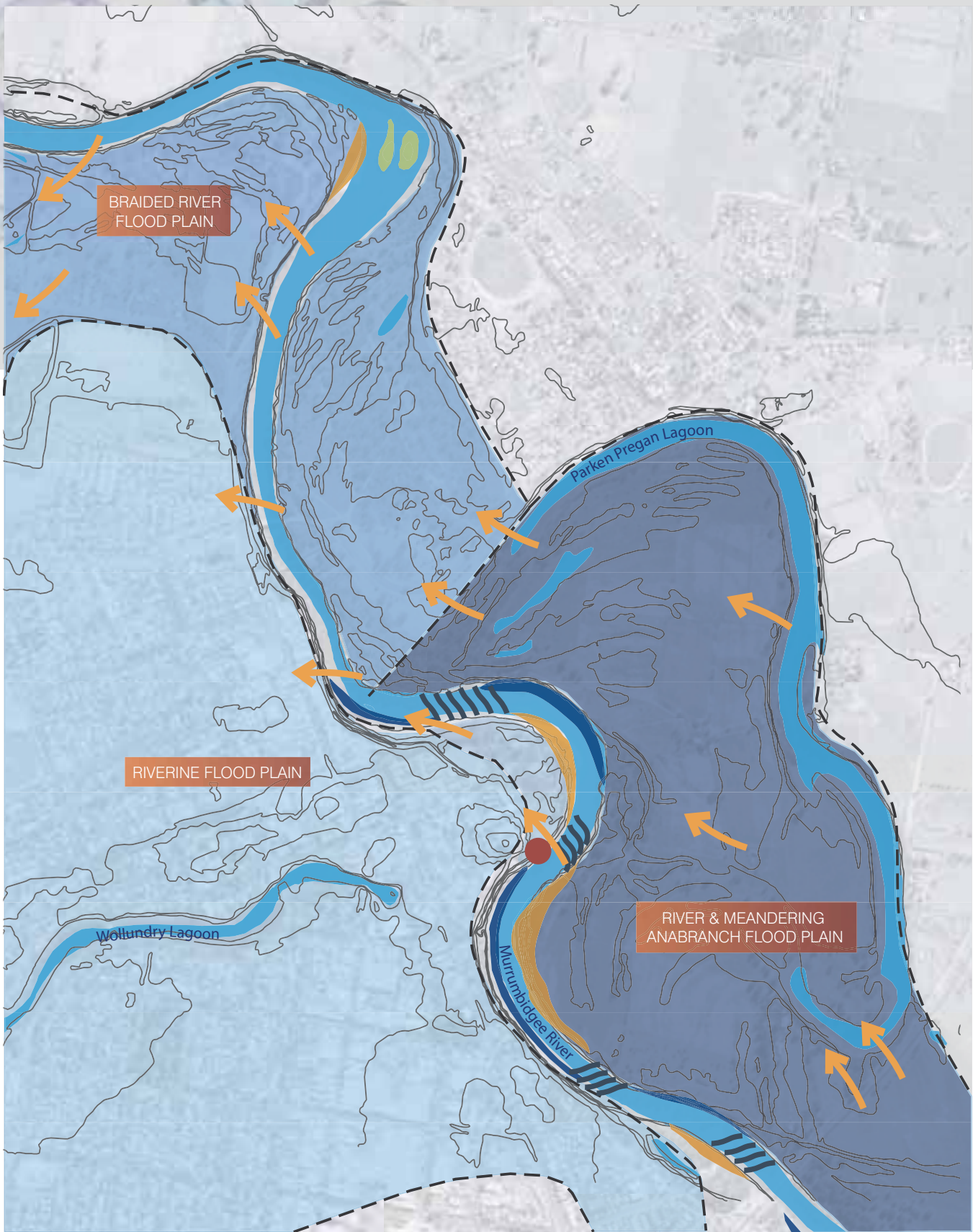
Major revegetation and habitat restoration work has been completed in Wilks Park. This work has included sowing areas with native grasses, planting local native shrubs and removing privet, willows and other woody weeds and the placement of nest boxes for Squirrel Gliders, *Petaurus norfolcensis*.

In the Wagga Wagga Local Government Area Squirrel Gliders are listed as an Endangered Population. However, the park has a widespread infestation of Cane Needle Grass, *Nassella hyalina*, which is related to Serrated Tussock, a noxious weed. Council have recommended that the entire area of Wilks Park must be protected from development in the strategic planning until the Cane Needle Grass is eliminated; and that only very restricted access should be allowed.

West of Wiradjuri Reserve is an area that encloses the Narrung Street Sewerage Treatment Works that has high biodiversity values due to the presence of many wetland species and abundant mature River Red Gum trees.

The Significant Areas of Biodiversity identified in the current LEP have been identified for a diverse range of attributes. Many areas contain substantial remnant vegetation of old River Red Gums and others are wetland habitats.

Threatened bird species can be found in most of these areas and Squirrel Gliders are known from sites along the Murrumbidgee River and Wilks Park within Riverside.



- Murrumbidgee River and existing water systems
- Meandering/anabranched based Flood Plain
- Braided River Flood Plain
- Elevated Riverine Flood Plain
- Over bank flood flows

- Bar
- Beach
- Island
- Pool
- Riffles



river geomorphology & ecology

Murrumbidgee River geomorphologic zones and elements



RIVER GEOMORPHOLOGY & ECOLOGY

Geomorphology provides a framework for interfacing a range of disciplines (engineering, hydraulic, landscape, ecology, climate change, sustainability, social, economic) relevant to the Riverside Master Plan, and for developing an understanding of flow, sedimentation & erosion processes, necessary to assess the viability of possible changes to land form or land use.

It defines the land forms, vegetation, habitat, ecology, hydraulic function and erosion / sedimentation zones which largely determine the natural resources values, constraints and opportunities.

Classification of fluvial geomorphology zones across the study area

The Wagga Wagga Riverine Zone needs to be understood in its catchment and river valley context:

- River Continuum Concept (RCC) – longitudinal gradient of sediment movement & deposition; longitudinal gradient of organic material size & composition.
- Riverine Production Concept (RPC) – lateral inputs of organic material & biota on falling arm of flood pulse, riparian litter input to stream flow.
- Flood Pulse Concept (FPC) – periodic flood as important disturbance to biota, driving bio-diversity.

The Valley Process Zones (VPZ) adopted in the Murray Darling Basin 'sustainable rivers audit' framework, comprise:

- Upland – sediment source, CPOM – mechanical degradation;
- Mid-slope – sediment deposition & re-suspension/transport – CPOM & FPOM mechanical & biological decomposition & mineralisation; and
- Lowland – sediment deposition & re-suspension, formation of floodplain, channel building, FPOM & DOM biological decomposition & mineralization.

The Functional Process Zones (FPZ) in the case of the Lowland / Riverine Valley Zone, comprise:

- Channel pools / reaches on the outer side of bends, as deep water pools promoting sedimentation & re-suspension during floods, interception of suspended organic material during medium to low flows, secondary production & mineralization of organic material. Dominant ecology one of secondary production, benthic macro-invertebrates, and higher (crustacea & fish) grazing on the macro-invertebrates;
- Channel shallow riffle zones between bends of the river, providing a substrate for benthic algae, fungi, bacteria (epilithon). The dominant ecology in this case is primary production (epilithon), and grazing by macro-invertebrates, crustacea & fish;
- Channel banks / bars on the inner side of bends, as zones of sand and silt deposition, riparian plant establishment, recycling of CPOM (vegetation) back into the river;
- Floodplain, as a major zone of suspended particle interception and entrainment during overbank spill from the river during the rising arm of flood events, sustaining diverse terrestrial plant growth, and return of high biomass of CPOM, FPOM & DOM to the river during the falling arm of flood events (overbank drainage); and

- Anabranches / secondary channels intercepting suspended particles during overbank spills, and discharging high biomass of FPOM & DOM during the falling arm of flood events, together with critical re-seeding of the river with a diverse range of biota. There is a changing connectivity of these systems with the primary river channel, as a function of river height.

Geo-morphologically, there are three key zones across the Riverside Master Plan Study site:

- the river and meandering / anabranch based riverine floodplain (area south of Hampden Avenue);
- the braided river floodplain (the Wilks / Wiradjuri area north of Hampden Avenue, including the northern loop); and
- the elevated riverine floodplain (area occupied by the city).

While the geomorphologic, hydraulic, biological & ecological processes have been significantly modified as a result of agriculture and river flow regulation (upstream water storages), the riverine structure is largely intact. Climate Change will bring further shifts in the hydrology, geomorphology and ecology of these systems and processes.

The riverine floodplain includes the cultural adaptation of the landscape to provide economic systems of production – timber, wool, beef, fruit and vegetables, grains (current floodplain use), as well as the natural floodplain vegetation and ecology. It tells a remarkable story of evolution, adaption, human settlement (indigenous and European) and management, as well as presenting a rich interpretative and recreational area.

Note that the city area remains an integral part of the riverine floodplain. While the levee protects it from inundation for large flood events, extreme flood events (> 1 in 100 yr ARI) will still inundate the city area. The old anabranches / lagoons remain key functional elements of the floodplain, and therefore need to be protected, with development respecting this process.

The Functional Process Zones (FPZs) within each geomorphological category define the land form, vegetation, habitat, ecology and hydraulic function.

The FPZs as shown in the River Geomorphology Plan include:

- channel banks, pools, riffles, beaches, bars and associated riparian vegetation;
- anabranch channels, banks, pools and riparian vegetation;
- braided channels, islands, bars, banks and riparian vegetation; and
- floodplain zones and overbank and anabranch spill and return zones, and associated vegetation.

Implications for drafting of the Riverside Master Plan

River pools comprise zones of deep water, high flow velocities during flood events, and erosion zones. They therefore comprise high risk areas with respect to changes to land form or vegetation exacerbating erosion of banks, and to public safety where the public are in close proximity to water.

The braided river channels zones are dynamic changing systems, with deposition of sediment creating bars, and erosion of banks creating new channels. Intervention in part of this system would lead to a shift to a new equilibrium, in respect to the pattern of deposition and erosion.



The over bank flow zones generally experience much reduced velocities as compared to the deep pools, but significant obstruction to these flow paths requires compensation via elevated flows and water levels elsewhere. Accordingly, major structures across the over bank flow zones should be avoided.

This understanding provides a framework of opportunities and constraints against which the development and assessment of modified land forms and location of facilities can be assessed.

The hydraulic and fauna & flora connectivity of the FPZs is critical to their functioning and adapting to Climate Change into the future. This is not just an environmental imperative, but an economic one as well.

An important finding from the assessment has been the number and the quality of anabranch lagoons across and adjacent to Wagga Wagga. The lagoons define key drainage pathways across the city (from a flood flow perspective), and significant natural resource values within the city – both important in a Climate Change period.

Lagoons include:

- Flowerdale Lagoon.
- Gobbagombalin Lagoon.
- Parkan Pregan Lagoon & floodplain.
- North Narrung St Lagoon.
- Billagha St Lagoon.
- Wilks Park floodplain.
- Bomen Lagoon.
- Wollundry Lagoon.
- Bentley Place Lagoon.
- Eunony Lagoon.

Two of the Precincts (The Bend and Hampden Terraces) fall into the 'river and meandering anabranch based floodplain' zone; while the Wiradjuri and Wilks Precinct is within the 'braided channels, islands, bars and banks' zone.

Opportunities

The number of remnant lagoons across the city area range well beyond the scope of the Riverside Master Plan. Their importance are as valuable environmental, economic and social assets and as key landforms determining responses to Climate Change. An example of an administrative framework to manage valuable natural resource assets in an integrated manner, is the establishment in 1970 of the National Capital Open Space System.

The National Capital Open Space System (incorporating major hills and ridge corridors, and river corridors) across the Canberra metropolitan area, has enabled substantial retention and management of these areas in their natural state, enhancing Canberra's capacity to adapt to the hydrologic, flora and fauna changes associated with Climate Change, and providing significant open space and recreational amenity for the residents of and visitors to Canberra.

A similar approach in Wagga Wagga, whilst beyond the immediate scope of Riverside, might comprise a "Wagga Wagga Riverine Park," which encompasses all of the Lagoons, the river and its riparian and floodplain zones.

This would provide an integrated framework for assessing the values of these ecosystems, their conservation values, restoration and management opportunities. It would be an acknowledgement of Wagga Wagga's unique place as an integral part of the riverine system. The sustainability, image, development, cultural, tourist, and research credentials of the city would present an amazing showcase for national and international interest.

Other opportunities include:

- Protecting and enhancing the braided flood channels in Wilks and Wiradjuri Parks and providing interpretation/boardwalks where appropriate.
- Capitalising on the variety in geomorphology and arranging workshops to discuss opportunities for education/interpretation through involving community, the University and council/ museum. Such approaches could add value to the eco-tourism attractors for Wagga Wagga .
- Design around the constraints presented with the flooding and geomorphology of the river and landforms., and see them as opportunities to express the unique elements as appropriate. For example ensure paths allow for viewing or access to the ripples of the river- so people can engage with the water element.



"The Rocks", an area well known to the people of Wagga Wagga; and created riffles downstream.



Looking north from Wiradjuri Beach to pool area against shoreline and islands to the left.





The Wagga Beach, northern section - a defined curve in the river.



The Wagga Beach, southern section - in front of existing caravan park.



View looking north from Hampden Terraces - pool area (with deposition) and riffles evident beyond.



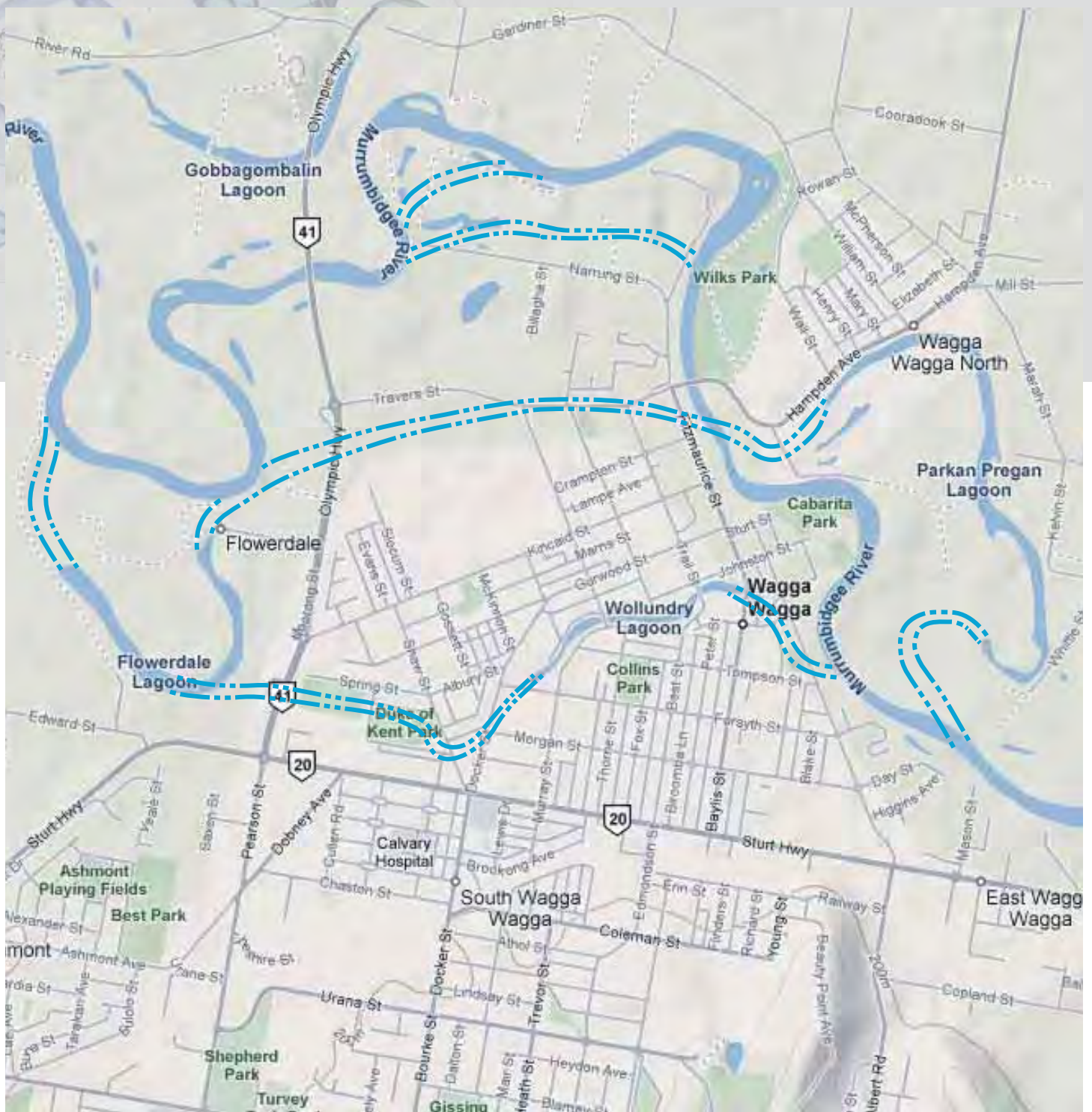
Looking north from Wagga Beach area - deposition on outer curve and deeper water against shoreline.



Braided channels within Wilks Park - in need of restoration with riparian species.



Old aerial showing the area of old anabranches / lagoons that provide the major overland flow paths during the inundation process.



- Murrumbidgee River and existing water systems
- Past flow patterns (Indicative)



old river channels

Indicative historical paths of water flow for Wagga Wagga and surrounds



OLD RIVER CHANNELS

Prior to construction of the levee and in times of increased flow the Murrumbidgee River is likely to have followed many different paths. The map opposite indicates approximate locations of past flow patterns- in particular for Flowerdale and Wollundry Lagoons, and the ones further north. These provide interesting background to the water patterns of the past, and provide opportunities for possibly re-interpreting the original water flows through future swales, drainage channels, or wetland embellishments within the Wagga Wagga environs.

The Master Plan will explore opportunities to express water as positive elements within the city's fabric. Future opportunities to explore water movements to reduce flooding of the city are beyond the scope of this Strategic Master Plan.



Photograph above is of the 1849 Town Plan; note the strong presence of Parken Pregar Lagoon and the Wollundry Lagoon.



1990s photo of the remnant lagoon areas of the Parken Pregar Lagoons, east of the bend in the river; now these areas are more difficult to read legibly as lagoons. Note that the Draft 2008 LEP has zoned this lagoon as Environmental Conservation. In recent years farming practices have further reduced legibility of the lagoons within the broader landscape setting.



Photograph above is of the existing end of the Wollundry Lagoon - Tony Ireland Park. From here the lagoon is piped under Tarcutta Street to the river.

RIVER & TOWNSHIP HISTORY

The following maps and summary descriptions outline the key changes of the city structure / urban pattern, relative to the river and the lagoons.

1849

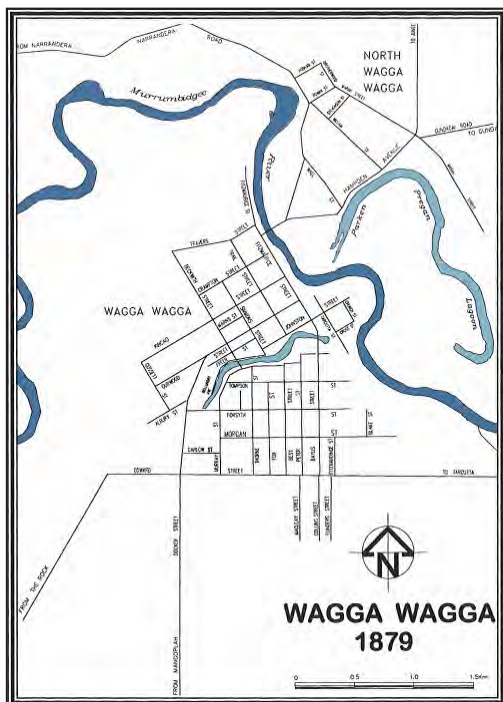
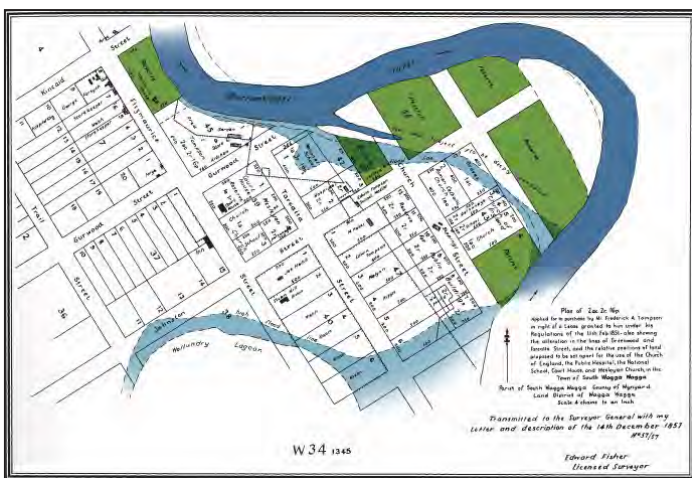
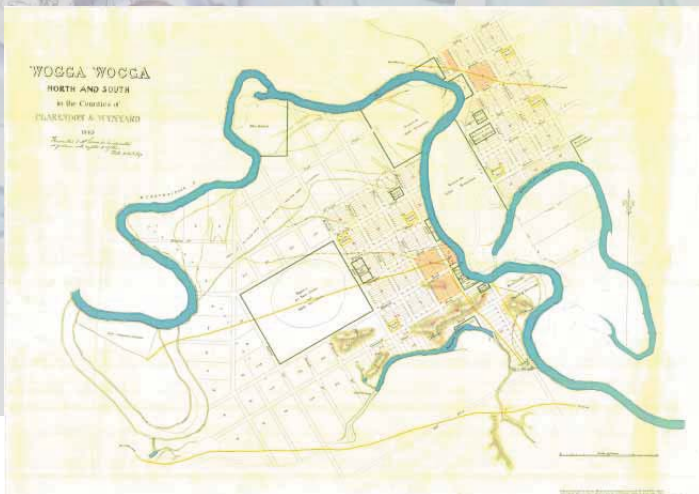
- Village nucleus on the riverbank near the ford.
- River and lagoons.
- Sand ridge dominant.
- Courthouse in main street.

1857

- Large reserves in floodplain.
- Reserve on corner Kincaid and Fitzmaurice Streets.
- Embankments and culverts along Tarcutta Street created for flooding.
- Bushland and swamps south of Wollundry lagoon turned into town lots.

1879

- Housing growth south and east.
- North Wagga depreciating in value.



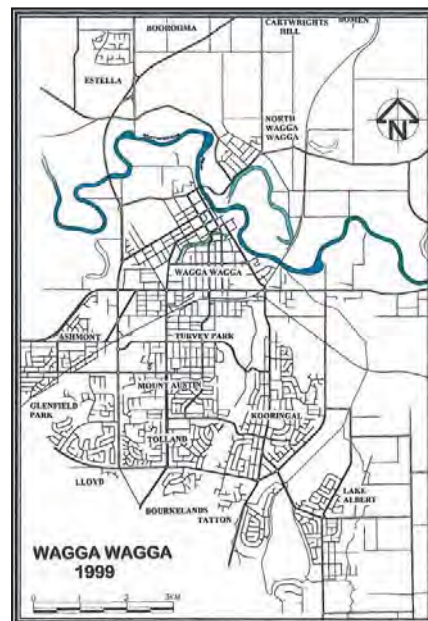
1922

- Town extended to higher ground to south.
- Tent town in the bend in the river below Hampden Bridge.
- Hampden Bridge (1905).
- Wagga Beach.



1999

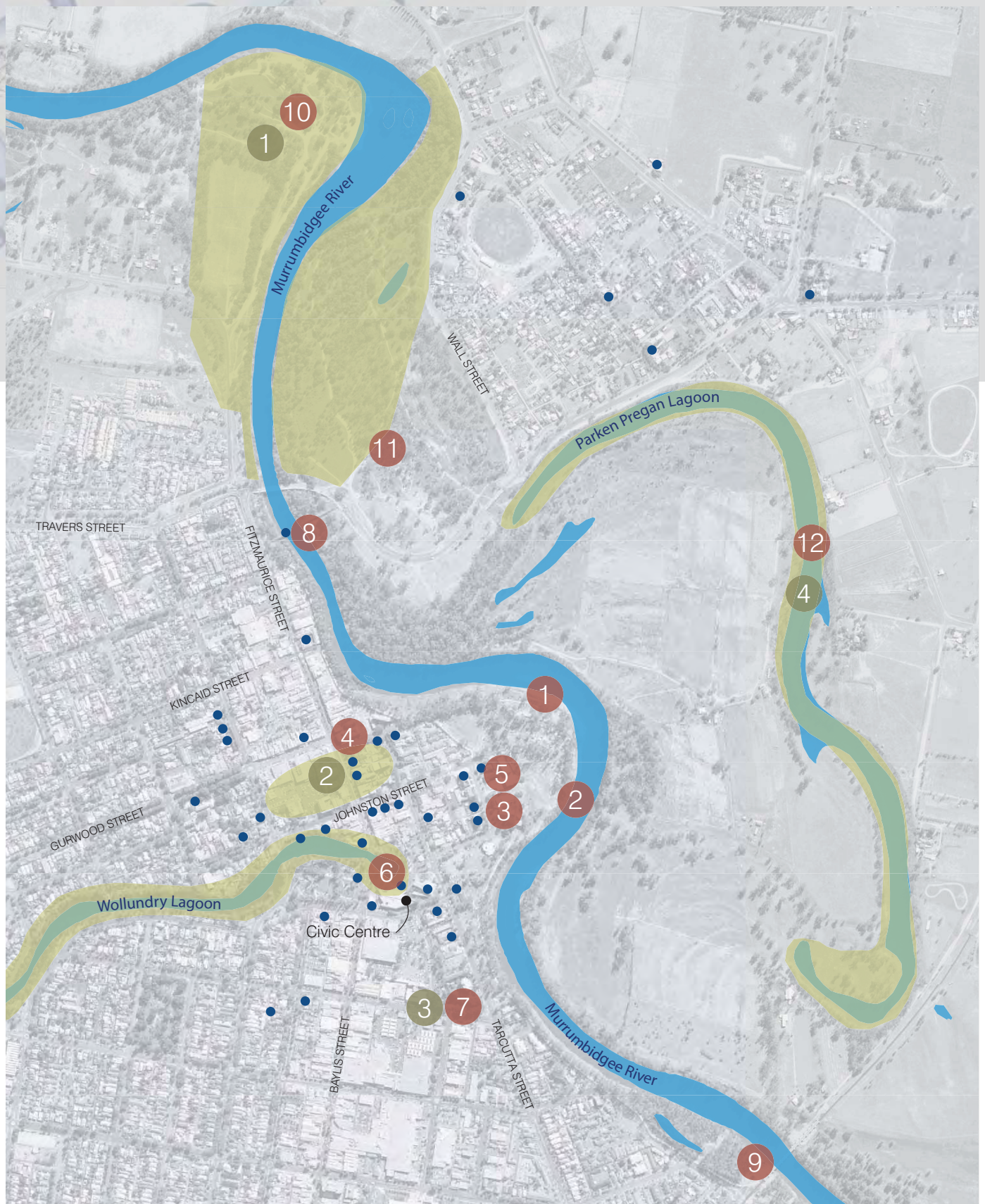
- Development of new subdivisions to the south development pattern disregarding town structure.
- Degazetted road in North Wagga Wagga (closer to river).
- Town backing to river.



2009

- Development pattern to the south and west continues.
- Charles Sturt University to north with distinct areas of Estella, Boorooma, Cartwrights Hill, Bomen.





Traditional Wiradjuri camping / hunting & gathering areas



European Cultural Sites (LEP)

1

Significant Wiradjuri Areas

1. Wiradjuri Reserve
2. Local Sand Hill
3. Tony Ireland Park
4. Parken Pregar Lagoon

1

Local Story Places

1. 'The Beach'
2. 'The Rocks'
3. 'Church Hill'
4. Romano's Hotel
5. Convent
6. Wollundry Lagoon
7. Tony Ireland Park
8. Hampden Bridge
9. Railway viaduct
10. Wiradjuri Reserve
11. Wilks Park
12. Parken Pregar Lagoon



cultural environment

Aboriginal & European places of significance, local story places



CULTURAL ENVIRONMENT

Wagga Wagga has a rich history incorporating Aboriginal and European heritage. For the purpose of this Strategic Master Plan a summary of only the key elements that add to the richness of the city and local area has been provided. These elements in particular need to be woven through the Story line of Wagga Wagga and as they provide inspiration and educative value for the community and visitors need to be creatively incorporated within the recreational and urban design / planning vision. Local story places have also been incorporated as they provide legibility and "place making" identity to the city / river structure. The material has been derived from the 2008 LEP and the Wiradjuri Heritage Study 2002, "A Guide to Wiradjuri Places of Wagga Wagga."

Key elements are described below:

Aboriginal History

Due to progressive and extensive changes to the landscape through agricultural practices and urban development, little direct physical evidence remains of Wiradjuri occupation. However, by visiting and resting a while at these places and by knowing their history, a connection with, and acknowledgement of, Wiradjuri cultural heritage can be made.

Wiradjuri lived in harmony with the environment using only what was needed from the land. Extended family or kinship groups travelled in response to seasonal availability of food, medicines, technological resources and cultural responsibilities. They lead a very spiritually based life. The waterways provided water, food, tools and materials sustaining aboriginal life. Dame Mary Gilmour 'Old Days Old Ways - A Book of Recollections' 1934, speaks of fish traps in this area of the river, the emu sanctuary across at Eunony, the pelican, swan and crane sanctuary at Parken Pregar Lagoon. There was major aboriginal occupation of the Menindee, Willandra - Hatfield Lakes areas 20,000 to 60,000 years ago, to the west of Wagga Wagga. The Darling, Murray and Murrumbidgee Rivers would have been the major migration route for aborigines coming in from the north.

Key elements of interest within the study area include:

Wollundry Lagoon:

- Wollundry means "place of stones". It was traditionally joined with the lagoon at Tony Ireland Park and also formerly connected to the Murrumbidgee River before Tarcutta St was constructed;
- it was managed traditionally by Wiradjuri as a fish breeding ground and fishing place;
- reputedly home to the Wawi, the serpent creature and ancestral being of the Wiradjuri people; and
- a log baulk was positioned across the outlet to restrict fish movement out of Wollundry Lagoon.

Hunters (Sand) Hill

- A meeting, corroboree and fighting place;
- a burial place (under the Wagga Courthouse); and
- meetings of up to 1000 Wiradjuri and their neighbours took place here (1840's-1850's).
- The Wiradjuri floral emblem, the silver leafed banksia that grew on the sand hill is now extinct locally.

Wiradjuri Reserve

- A traditional Wiradjuri camping place with access to the riverside,



Pelicans and Swans frequent the lagoons in wetter seasons.



The name "Wagga Wagga" derives from a modification of the Wiradjuri word "Waagan," (Crow or Australian Raven). The doubling of the words "Wagga" to "Wagga Wagga" indicates the plural or gives emphasis. Thus "Wagga Wagga" signifies simply a place remarkable for flocks of these birds or a place where they congregate or gather in large numbers."(1)

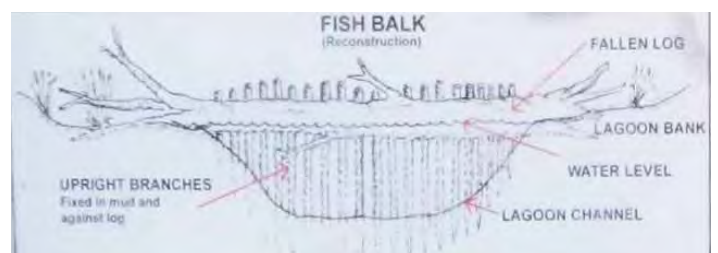


Image from the site sign - a fish baulk was positioned by Wiradjuri across the outlet of the Wollundry Lagoon where Tony Ireland Park lagoon is, to restrict fish movement out of the Wollundry Lagoon. The lagoon used to be connected with the Murrumbidgee River prior to Tarcutta Street being constructed.

beach and shallow water; it was referred to as a "crossing place" - a Wiradjuri representative referred to "he keeper of the crossing."

For the Europeans also the place had significance as a crossing place, and a camping place. (Wiradjuri representatives meeting 2010).

Overall the significance of the Wiradjuri Reserve was the Environment- food source, water, shelter; from which both the Wiradjuri and European cultural significance flow.



The Beach- "Cabarita"

The word maybe derived from the Wiradjuri language, is an Aboriginal word meaning "by the water."

Murrumbidgee River

The River itself has the most significance of all the individual sites, as it is a life source as well as a spiritual source. The origins of the name Murrumbidgee are "Big River" (Wiradjuri representatives meeting 2010).

Wiradjuri Walking Track

Parts of the track, close to the river are part of the traditional walking track. (Wiradjuri representatives meeting 2010).

European Heritage

There is a heritage study on Wagga Wagga and the 1994 Mainstreet Study outlined the heritage significance of the key elements within the city structure, in particular along Fitzmaurice Street. The shown elements of interest on the plan have been derived from the "European Cultural Sites," on the 2008 LEP. These sites / elements should be considered in terms of vistas, inter-relationship of any proposed built form, scale etc.

Local Story Places

From listening to people at the community workshop and to Wagga Wagga residents relating to the places around the city we have summarised the key areas that people often relate to as places around the city. These are significant as they create legibility and form strong elements within the "place making" of a city, and within the proposed strategic Master Plan.

All of the cultural elements in particular provide inspiration for future activities / themes / design and interpretation signage for Riverside.

The Rocks was a popular place for fishing.

Cultural Activities

Although difficult to map, there are a number of festivals and activities that elevate the city. Wagga Wagga has a rich community with regular events that include:

- monthly farmer's market
- weekly markets on Myers carpark
- film festivals
- music festivals
- art on the levee
- museum exhibitions
- art exhibitions
- indigenous community events
- Lake to Lagoon Fun Run
- Wagga Gold Cup

Such activities need space, access and circulation and need to be considered in the Master Plan to ensure that the new community / recreational spaces can suitably accommodate them now and in the future.

There is scope to consider re-introducing significant community events such as the Gumi races to enliven the city as well.

The Wiradjuri Representatives (April 2010) suggested that there is a need for a cultural centre to provide:

- A shop front for aboriginal culture
- Performance space
- Space for teaching Wiradjuri culture and language
- Space for guest artists – artist in residence
- Space for a cultural display / keeping place.

Further consultation relating to these concepts and ideas relating to the major community facility and the concept of a "keeping place" for aboriginal artifacts needs to continue in following stages of the project.

There is scope for interpretation signage to display the richness of the Aboriginal and European heritage through the site, and for innovative concepts relating to employing Aboriginal people in the future development of the parkland/Wiradjuri cultural aspects of the project.



Farmers Market, September 2009





Crab Cycle Gumi, Museum of the Riverina



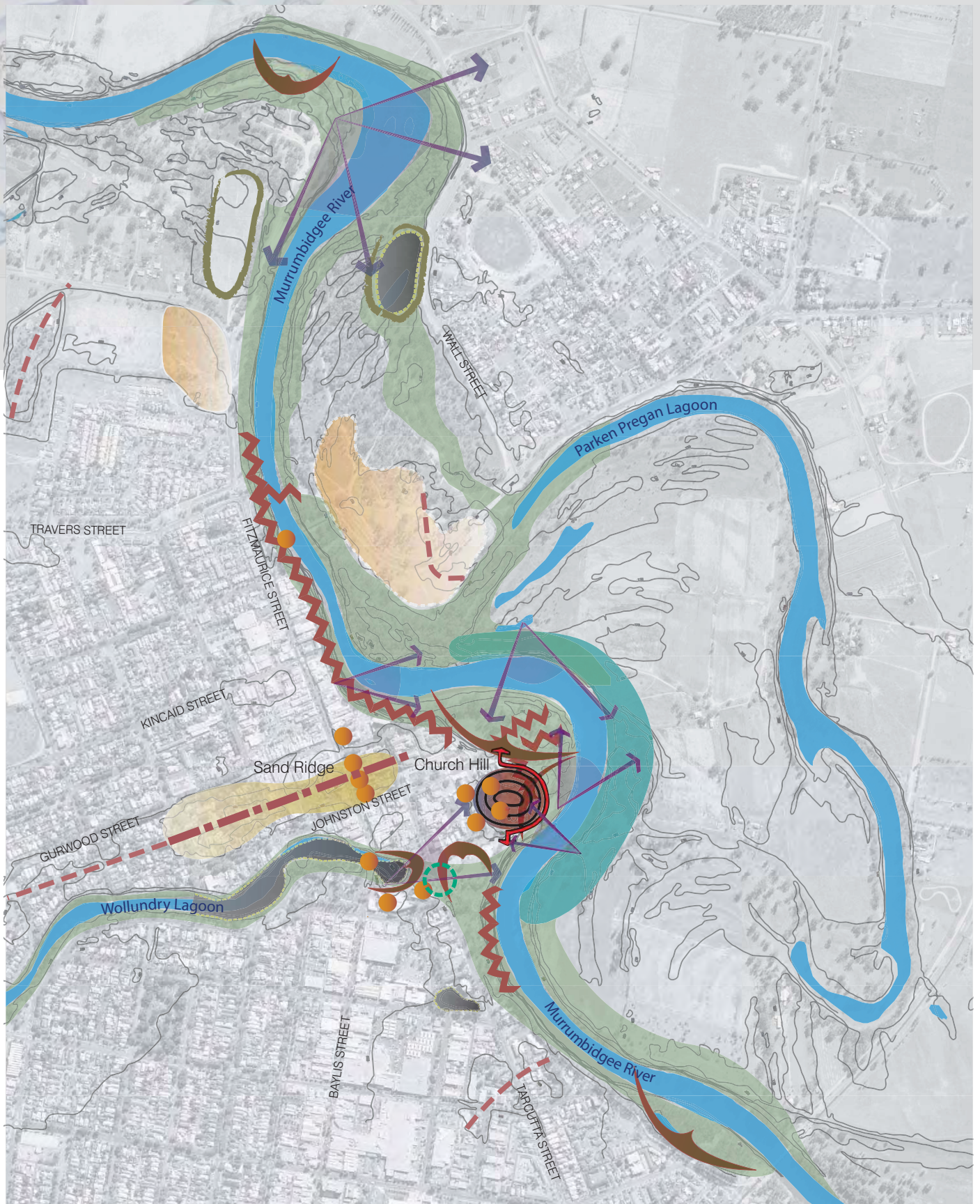
Wagga Beach (c. 1980s)



Courthouse, Fitzmaurice Street



Wagga Beach playground, (photos courtesy of Wagga Wagga City Council, c. 1980s)



-  Significant Built Form
-  Main Visual Detractors
-  Sunken Depressions
-  Enclosing Slopes / Spaces
-  Primary Ridgeline
-  Secondary Ridgeline

-  Prominent Landform
-  Significant Contextual Views
-  Visually Exposed Open Areas
-  Visually / Spatially Enclosed Areas

-  Create Entrance Space
-  Panoramic views
-  Significant Natural Edge
-  Critical Green Space



visual & spatial analysis

Identification of important views, visual detractors and spatial connections



VISUAL & SPATIAL CHARACTER

A key visual detractor and spatial barrier is the existing levee itself. It appears as a man-made element, disregards the city's built structure and does not integrate with the natural landscape setting of the river. As a result, the existing levee could be considered an extraneous element that does not relate to either side.

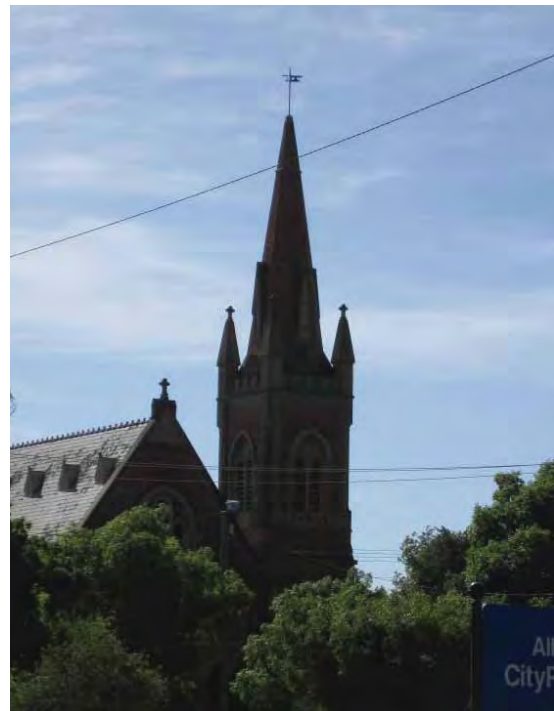
The prominent landform of Church Hill combined with the various church spires provides a significant visual backdrop that is iconic to Wagga Wagga. Views towards this ensemble need to be exploited to promote the city's visual identity.

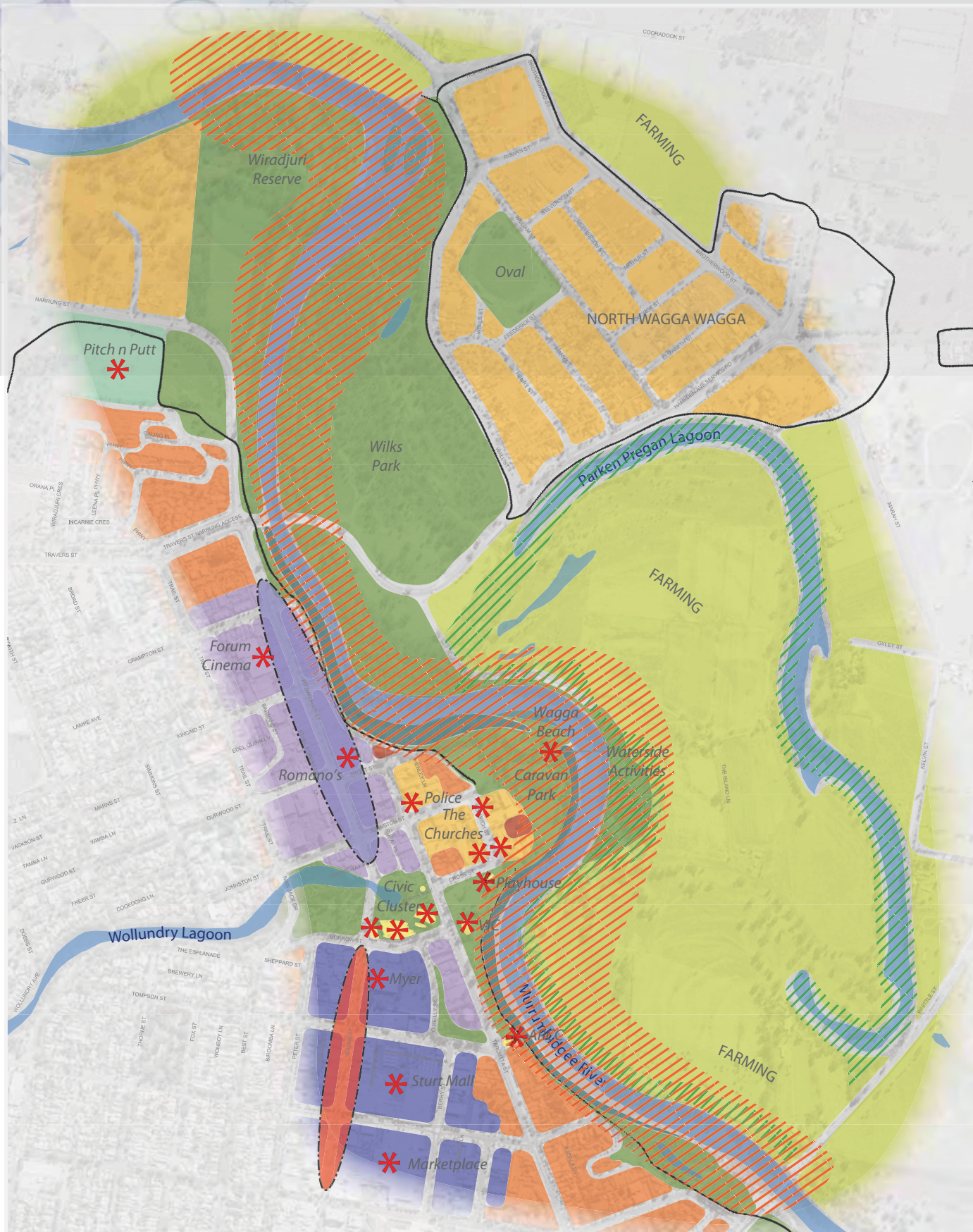
A number of significant built form and particularly heritage buildings flank Baylis and Fitzmaurice Streets. The visual continuity and visual quality of these built form elements strongly add to the character and visual experience of the city.

The river itself forms a strong sinuous element that is predominantly of a "natural" picturesque aesthetic. This element requires careful consideration in relation to future development and river crossing points (for example bridge sites) and consideration of critical viewing areas. The green buffers to the river itself are visually and environmentally significant, and the central sinuous curve of the river, that embraces the form of Church Hill is of particular significance and should be maintained as a landscape dominant form.

Whilst the east / west ridge through the city, north of Wollundry Lagoon is not visibly legible due to the covering of built form, it nevertheless provides legibility to the overall city structure. From this ridge one can view down towards the Wollundry Lagoon and east towards Church Hill.

The Wollundry Lagoon is a visually significant element within the city centre and any opportunities to integrate and link it with the riverside should be explored to create a seamless urban fabric. It is the integration of the various elements such as lagoons, architecture, public spaces that creates a unifying composition and a rich urban fabric.





- | | |
|---------------------------------|--------------------------------|
| Parkland | Institutions (mainly Churches) |
| Inaccessible Cityside Riverside | Higher Density Housing |
| Farming | Standard Density Housing |
| Civic/Council | Lower Density Housing |
| Town Centre Retail | Private Sports Facility |
| Retail/Commercial-Mixed Use | Environmental Conservation |

- | |
|----------------------------------|
| Activity Generators |
| Little or Inappropriate Activity |
| Low Level of Activity |
| Active Main Street |
| Levee |



existing land uses



LAND USE - Existing Conditions

The plan opposite shows the existing pattern of land use at Riverside Wagga Wagga and its environs. This has been derived through a desk top analysis of existing policy, on-site inspection and consultation. There are a number of distinctive characteristics of the land uses adjacent to and associated with the riverside.

They are as follows:

- Wagga Wagga city centre and the riverside already accommodate a number of activities. Many of these take place within specific parts of the city and riverside with little mixture of uses. The uses include:
 - City centre retail
 - Retail/ commercial - mixed use
 - Civic – including Council
 - Institutional – including Churches
 - Residential – including lower and higher density residential
 - Parkland
 - Farming
 - Waterside recreation / sports
 - Private Sports Facilities
- there is little activity or inappropriate activity at the riverfront – examples of inappropriate activity include the random and environmentally disrespectful use of Wiradjuri Reserve and the use in Wagga Beach area of a caravan park that physically dominates the setting, thereby restricting the larger community to celebrate the riverside;
- the river is inaccessible in some locations;
- there are a number of generators of activity located near the river. These are primarily located south of Wollundry Lagoon adjacent to Baylis Street and are retail attractors. The generators of activity adjacent to the lagoon are either civic – the council, museum and playhouse or the churches;
- there are very few generators of activity north of Wollundry Lagoon;
- Fitzmaurice Street – traditionally the main street of Wagga Wagga now has a 'low energy' feel;
- there is no activity on the eastern side of the river;
- the water elements of the city – the lagoon and river - are separated;
- there is no celebration or education of the river;
- the city elements – North Wagga and Wagga Wagga - are distinctly separate; and
- there is lower density development in North Wagga.



- Existing Landmark Building or Structure
- Existing Buildings
- Levee



built form

Figure Ground and Landmarks



BUILT FORM

The plan opposite shows the existing pattern of built form in Riverside Wagga Wagga and its environs. The built form has been analysed with respect to both the pattern of settlement – building size and layout and subsequent urban form and the prevalence and location of landmark buildings and structures – church spires and tall buildings.

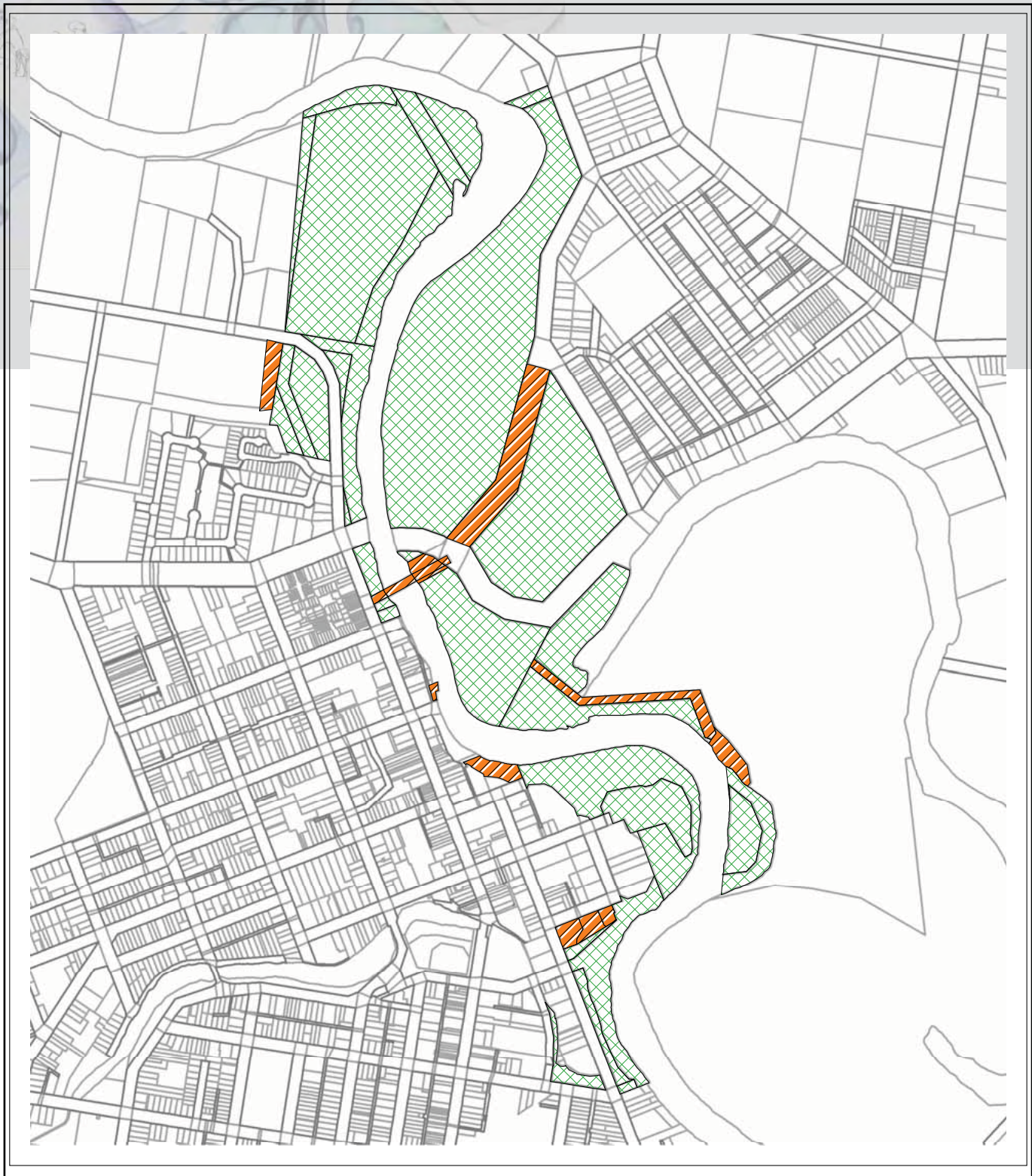
There are a number of distinctive characteristics of the built form adjacent to and associated with the riverside.

Settlement Pattern

- The buildings adjacent to the streets define and frame the long views to the riverside;
- in the majority of cases the views to the riverside incorporate a view of the levee;
- streets lead directly to the riverfront along a significant length of the river and are often blocked off by the levee;
- the two parts of the city, Wagga Wagga and North Wagga, are distinct and separate from one another;
- there are few buildings within the floodplain areas. To the west of the Murrumbidgee buildings are close to the river, in particular adjacent to Cadell Place;
- the levee is a clear demarcation line between the buildings and the riverside;
- North Wagga is not fully developed. It is a low density environment characterised by detached houses, large yards, vacant lots and laneways;
- non-residential uses are clearly delineated. This is highlighted by the built form adjacent to Fitzmaurice Street and particularly that south of Wollundry Lagoon adjacent to Baylis Street; and
- there is a greater sense of enclosure along Fitzmaurice Street and Baylis Street with gaps in the 'urban fabric' behind these streets typically created by car parks.

Building Landmarks

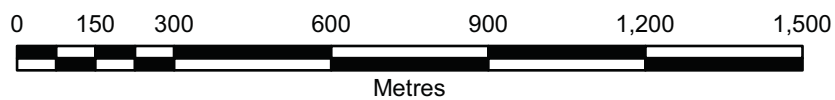
- Landmark buildings are clustered in and adjacent to the historic core of Wagga Wagga and on Church Hill; and
- there is little in the way of landmark structures immediately adjacent to the river apart from the Hampden Bridge;



RIVERSIDE WAGGA WAGGA SHOWING CROWN & COUNCIL LAND

Legend

-  Wagga Wagga City Council
-  State of New South Wales



Disclaimer:
The information contained in this map has been provided in good faith.
Whilst all effort has been made to ensure the accuracy and completeness
of this information the data providers take no responsibility for errors or omissions
nor any loss or damage that may result from the use of this information.
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LAND OWNERSHIP

The adjacent map provides an overview of Council and Crown Land; and State of New South Wales land ownership. There is a strong correlation between the Master Plan area and land held either by Council or the Land and Property Management Authority.

The land ownership is significant in so far as it identifies potential revenue sources from development opportunities identified by the Master Plan. These revenue sources could become critical in making parts of Riverside a reality.

The tables below provides a break-down of the land ownership in the various Master Plan precincts.

WIRADJURI AREA

LAND OWNERSHIP	RESERVE NUMBER	LOT & DP
Crown Reserve	64975	LOT 7009 DP1115364
Crown Reserve	57860	LOT 303 DP757249
		LOT 7003 DP1116547
		LOT 277 DP757249
		LOT 7004 DP1116547
		LOT 7008 DP1115364
		LOT 7005 DP1115514
		LOT 7006 DP1115514
		LOT 7007 DP1115514
Crown Reserve	57863	LOT 5 DP193626
Crown Reserve		LOT 7010 DP1115581
Crown Land		LOT 7011 DP1116224
Council Land		Part LOT 1 DP260462

WILKS AREA

Crown Road		Hopkirk Street
Crown Reserve	43154	LOT 7013 DP1115880
Crown Reserve	58656	LOT 7014 DP1125781
Dedicated Crown Land	620077	LOT 441 DP751422
Crown Reserve	5660	LOT 7015 DP1115516
Crown Reserve	91500	LOT 7015 DP1115516
Council Land		LOTS 1, 2, 3, 4, 5 & 6 DP875316
Council Land		LOT 1 DP599646
Council Road		Gardiner Street
Council Road		Unnamed

HAMPDEN TERRACES

Crown Reserve	76984	LOT 7080 DP1116297
		LOT 7081 DP1116297
		LOT 1 SEC 6 DP759031
Crown Road		Cadell Place
Council Land		LOT 2 DP857894
		LOT 2 DP700199
		LOT 3 DP1138428

THE BEND

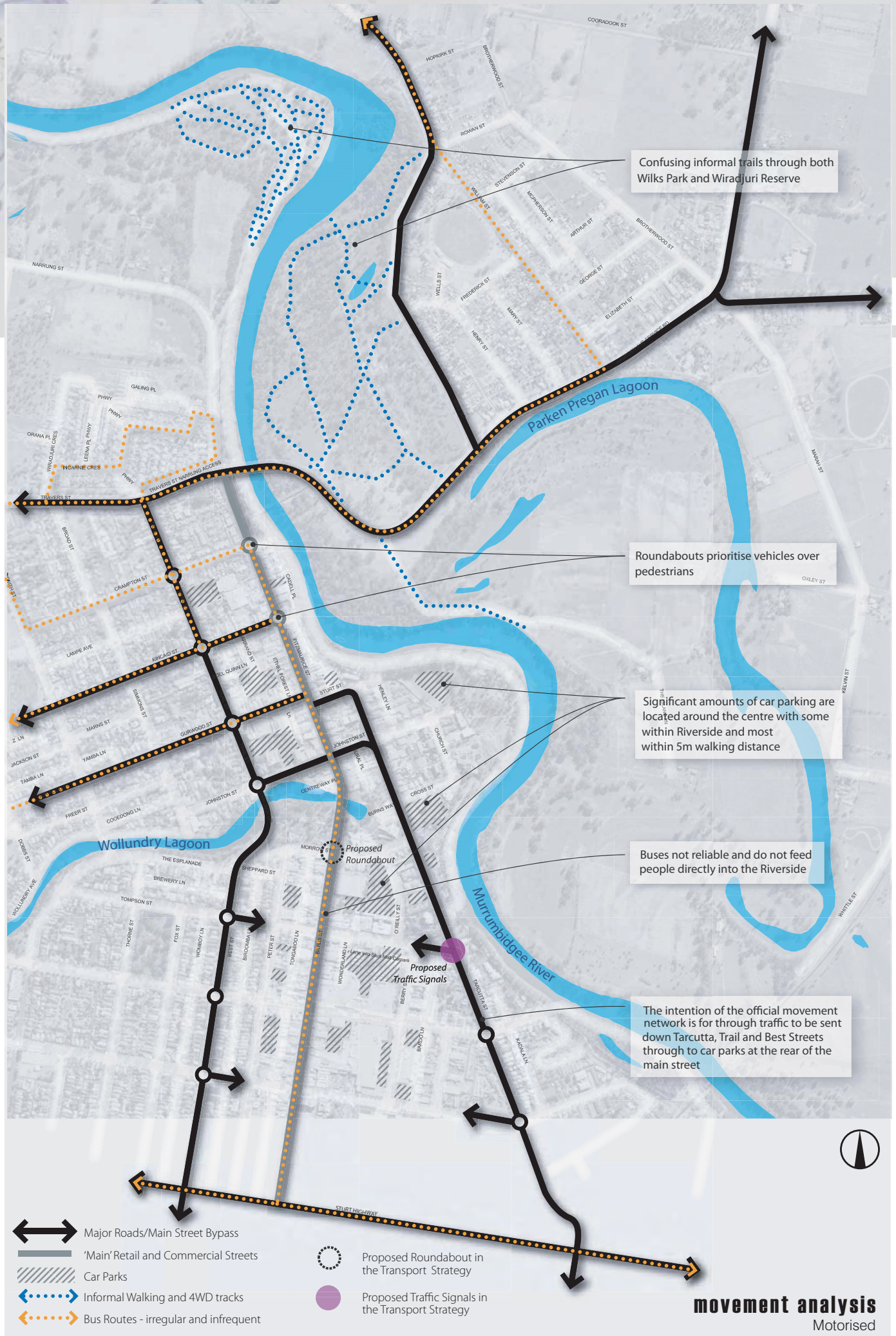
Crown Reserve	620057	LOT 7068 DP1124868
		LOT 1 DP1009920
		LOT 7032 DP1132609
Crown Land		LOT 2 DP1009834
Crown Land		LOT 13 SEC42 DP759031
Crown Reserve	50638	LOT 7305 DP1132872
Crown Reserve	83074	LOT 7306 DP1132872
Crown Reserve	87557	LOT 335 DP1019131
Crown Reserve	87043	LOT 7307 DP1132470
Council Land		LOTS 3,4 DP828377
Council Land		LOTS 1 DP717828

MOVEMENT - Non Motorised Analysis

The plan opposite shows the existing patterns of non-motorised movement and access in Riverside Wagga Wagga and its environs. Non-motorised modes of transport have been defined to include walking and cycling as well as other modes of active recreation such as hiking, skateboarding and rollerblading. Non-motorised transport modes also include wheelchairs and gophers.

There are a number of distinctive characteristics of the movement and access adjacent to and associated with the riverside. These include:

- Access to the levee top is restricted within the city centre and serves to limit pedestrian access to the riverside;
- the roundabouts on Fitzmaurice Street prioritise vehicles over pedestrians;
- there are no walking or cycling trails across to or on the southeastern side of the river;
- cyclists are intended to use Wiradjuri Trail and Wollundry Loop, this has the potential to create conflict between them and pedestrians;
- the Wiradjuri Trail and Wollundry Loop utilise the levee and connect people to and along the riverfront;
- there is no direct connection to the Railway Station and proposed Riverina Rail Trail from Riverside; and
- the walkable catchment of the Murrumbidgee River is restricted in the area around Fitzmaurice Street by the levee which restricts pedestrian access to the riverside.



MOVEMENT - Vehicular Analysis

The plan opposite shows the existing patterns of motorised movement and access in Riverside Wagga Wagga and its environs. Motorised transport has been defined to include private vehicles, delivery vehicles and public transport.

There are a number of distinctive characteristics of the movement and access adjacent to and associated with the riverside. These include:

- Confusing, informal and destructive trails through both Wilks Park and Wiradjuri Reserve;
- existing and proposed roundabouts which prioritise vehicle movements over those of pedestrians;
- significant areas of at-grade car parking around the city centre with some within Riverside and most within a 5 minute walking distance;
- unreliable and infrequent bus services which do not feed people directly to Riverside; and
- a network of ring-roads where through-traffic is directed to Tarcutta, Trail and Best Streets in order to access car parks at the rear of the Baylis and Fitzmaurice Streets. These ring roads create additional barriers between the city centre and the riverside.



RIVERSIDE FLOOD PROTECTION

Background to Riverside Master Plan

Wagga Wagga City Council and LPMA's decision to develop the Riverside Master Plan, arises from a recognition that the River and riverine zone adjacent to the city is an extraordinary asset, currently largely ignored by the city.

Key objectives of the Master Plan comprise:

- enhancing the city's open space, landscape and recreation values through re-connection with River;
- building a more sustainable future through recovering important natural city – River linkages and environmental values; and
- enhancing cultural, academic, heritage and aesthetic engagement afforded by re-connection of the city with the River.

The Main Flood Levee constitutes the major obstacle needing to be addressed in order to meet these objectives. The Levee is also the defence against the greatest potential risk to the City and the well-being of its citizens – damage and loss of life from a major flood.

In addition, the River bank represents a key landscape element in respect to accommodating recreation and cycle ways, and its relationship to the River.

The Riverside Master Plan analysis has explored the levee and River bank forms, arrangements and alignments that facilitate meeting the Master Plan objectives.

This section identifies the key management issues in respect to the Levee and the River bank, and assesses a range of possible options for addressing the issues.

River bank & levee risk assessment

The Murrumbidgee River bank (City side) and its levee comprise three broad landforms:

- steep slopes (2:1 to 2.5:1), rising to a height of 10 to 11 metres;
- moderate slopes (3:1 to 4:1) with berms, rising to a height of 10 to 11 metres; and
- gradual slopes (< 4:1) comprising natural surfaces and a 'set-back from bank' levee.

Soils within the River banks are generally alluvial soils of the Farnham Soil Landscape Group. The soils are classified as highly plastic Eutrophic Brown Dermosols. The soil texture comprises loam to clay-loam, having 10% to 25% of clay, with sand lenses.

Risks to the integrity of the slopes and their vegetation cover comprise:

- erosion of the slope surface during periods of high flow
- structural failure of slopes, as a result of:
 - dispersion (loss of cohesion strength) of fine cohesive material in the toe of the banks, with wash-out by elevated flows or groundwater discharge post drawdown, followed by collapse of the overhanging bank;
 - slope slippage as a result of high loads (steep and high banks, superimposition of levees), and rapid drawdown of River height post irrigation water supply season.

Bank erosion risk levels

The Wagga Flood Study Hydraulic Model produced estimates of flow velocity for each event, at a range of points across the floodplain. The flow velocities for the 100 ARI flood at Hampden Bridge, Cabarita Park and the Railway Bridge were 1.5, 1.3 & 1.0 m/s respectively. Critical scour velocity for grass (level surface) is 2 m/s. The critical scour velocity are lower for a steep batter.

High velocities (1.3 to 1.5 m/s) were estimated for the Kincaid St to Hampden Bridge to Narrung St reach (a zone of major flood flow restriction) and (1.4 to 1.7 m/s) for the Narrung St to Gobbagombalin Bridge to Flowerdale Rd reach.

As part of the Riverside assessment, hydraulic analysis was undertaken of the distribution of velocities across the River at bends, indicating elevated velocities at the outer bank and low velocities at the inner bank of the bends. This understanding of flow velocities, together with the geomorphological assessment of erosion and sedimentation zones, forms an important input to identification of Riverside development opportunities and constraints.

River flow is concentrated at the outer bank of bends, with highest velocities (1.3 – 1.5 m/s) and depths (pools) occurring at these locations. Conversely, the reduced velocities (0.6 – 0.8) adjacent to the inner bank of bends promotes sedimentation – formation of shallow beaches.

Straight reaches of the River are typically located within narrower channel sections, with flow (1.1 – 1.3 m/s) distributed evenly across the flow cross section. Sediments within these reaches are typically gravels and sands (riffle zones), reflecting deposition rather than erosion conditions within these reaches.

River obstructions/(bars & bridges) create turbulence and disruption to the normal flow paths. Located at the end of a straight reach, the rock bar opposite Cross St is overtopped during flood flows, with overbank flow occurring across the Cabarita Park floodplain zone. The Henley Lane levee wall is located well back from the River.

Bridge abutments (Hampden Bridge, Railway Bridge) constrain the flow cross section, or impose obstructions to flow, typically creating elevated flow velocities and turbulence locally. Flow velocities identified above are from the 2004 Flood Study for the 1 in 100 ARI event.

In summary, the analysis points to the outer banks of River bends as the zones at greatest erosion risk, followed by straight sections of the River, with inner bends of the River having lowest erosion risk.

Currently, the River banks are armoured against erosion by a vegetative cover of trees, shrubs and grasses. At lower levels, where irrigation water release (extended periods of inundation) limits the viability of plants, rock revetment has been used to stabilize banks in vulnerable locations. Some slope toe failures are evident in these sections, probably due to dispersion of fine clay material – washout by flow or groundwater drainage post irrigation water supply period.

The Riverside proposals do not involve any works or changes in respect to these lower slopes. However, there are some steep slopes where it is proposed to either step back the levee, or replace it with a retaining structure, enabling the incorporation of a berm into these slopes. This would provide improved access for maintenance and rehabilitation works on these lower slopes.

In some locations, flood flow velocities are close to scouring velocities for grass. A particular concern currently is the clearing of exotic species such as Willows, on extremely steep batters.

Serious maintenance issues arise where steep batters exist and where the lack of berms across the slope, limit access and conditions for the establishment of replacement plants.



Slope stability assessment

STEEP SLOPES

At the human scale, the steep slope is an unfriendly landscape, presenting a serious impediment to connectivity and movement, and detracts from the aesthetic and environmental values of the riverine landscape. It also creates serious maintenance issues, and raises concerns regarding slope stability and bank erosion control.

In several locations, the river bank slopes at 1:2.0 to 1:2.5, for a vertical height of 11 m. The Flood Levee upgrade requires an increase in levee height of 0.8 m for the section between Crampton and Sturt Streets – a section which already has an extremely steep batter with negligible berms across its 11 m height.

The critical slope stability condition for the river bank is rapid water drawdown – drop in water level post flood event, or drop in water level post irrigation supply period.

In the case of floods, the relatively short duration of elevated flood levels (2 to 3 days) limits seepage into the bank, such that the development of elevated pore water pressures is limited. The duration of the irrigation peak release flows is considerably longer (4 months), giving rise to a greater depth of river water infiltration. However, the irrigation water supply river rise is limited to 3 - 4 m. The presence of sand lenses would modify this assumption.

Preliminary slip circle stability analysis was undertaken for typical river slopes and heights in the riverside area.

SLOPE	SLIP CIRCLE RADIUS	TEST NO.	SLOPE TYPE	FACTOR OF SAFETY
2.5:1	20m	1	Existing whole slope	1.9
		2	Modified whole slope	2.6
	14m	3	Existing whole slope	2
		4	Modified whole slope & berm	2.1
2.0:1	18m	5	Existing whole slope	1.8
		6	Modified whole slope	2.0
	20m	7	Existing whole slope	1.6
		8	Modified whole slope	2.0

Table 1. Summary of Stability Tests and Factor of Safety assessment

Refer to 'Riverside Master Plan: river bank slope stability analysis' for details of this assessment. The slope stability assessment yielded a Factor of Safety of 1.9 for existing slopes of 2.5:1, improving to a Factor of Safety of 2.6 with the slope modification.

In the case of the 2:1 slopes, the Factor of Safety of existing slopes was assessed as 1.6. This is very close to the minimum permissible Factor of Safety (1.5), and points to the need for closer investigation of the river bank slope stability.

The assessment included analysis of changes to Factor of Safety resulting from proposed riverside modifications to the slopes, including the set-back of levees and reduction in upper slopes and / or incorporation of berms, and removal of the earth levees and their replacement by retaining structures, such as gates or sheet piling. The Factor of Safety for the modified slope in the case of the 1:2 slopes, improved from 1.6 to 2.0.

It is concluded that the proposed modifications to the steeper slopes results in significant enhancement of the stability of these slopes.

Management Option: Incorporation of Berms into River Bank

Currently, in a number of locations, the levee slope continues unbroken to the bed of the river, presenting a steep and extremely high slope that:

- is unsympathetic to people movement along the corridor (safety, access, aesthetic);
- is potentially unstable; and
- is difficult to stabilize following removal of exotic plant species (Willows).

The Study has assessed a range of options for ameliorating this situation, including:

- moving the Levee bank towards the city;
- removing the earth levee bank in locations where a concrete retaining wall exists; and
- removing the earth wall and replacing it with a concrete or sheet steel piling barrier.

The extra width provided by these options would then be split between two berms across the slope – one at the base of the levee structure, and the second just above the high irrigation release flow level. Natural flows typically erode a series of berms, upon which trees and shrubs take hold and armour the surfaces against subsequent erosion. In addition, the 'hydraulic roughness' created by the trees reduces river flow velocities adjacent to the banks.

With this arrangement, the rock revetment would be limited to the slope below the high irrigation release flow level, and overall bank protection and flood protection of the city enhanced.

Management option: Moving the earth levee bank towards the City

There are some reaches (Tarcutta St) where the moving of the earth levee towards the city appears possible, without loss or impacts on private land use.

Management option: Replacing earth levee sections with a concrete wall or sheet steel piling

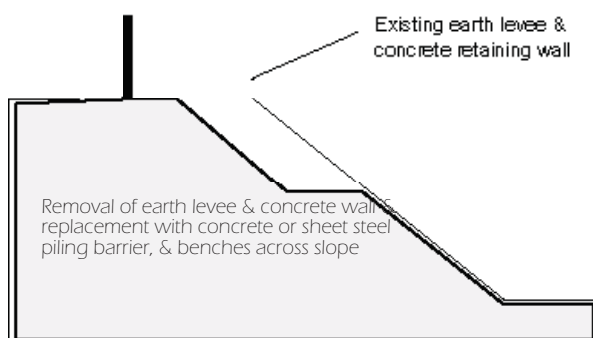
Currently, there is a concrete wall between Sturt St and Crampton St section of the levee, comprising a thin (120 mm) wall of precast concrete slabs, with breaks to incorporate power poles, and section of a thicker (240 mm) continuous concrete wall.

Analysis indicates that the thin wall is little more than an earth retaining structure, and would not serve as a flood water barrier in the absence of the adjoining earth levee. Preliminary analysis also raises doubts regarding the structural integrity of the thicker wall. Although it has sufficient integrity as a earth retaining structure, it may not suffice as a water retaining structure. Investigations may be required to reinforce the existing structure for this purposes.

Adoption of a vertical wall would provide an additional 17 to 22 m of additional width for the incorporation of benches across the slope, and an effective reduction in the steepness of the slope.



Below: Cross Section of earth levee removal arrangement on walled sections



Concepts/options:

- Use of gated structures to provide visual and movement connectivity between the city and the riverine zone;
- use of gated structures or concrete wall, or sheet steel sheeting in place of the earth levee, to enable reduction in slope steepness and incorporation of berms into slope; and
- set-back of levee location, to enable reduction in slope steepness and incorporation of berms into slope.

The bottom berm should be set just above the 'irrigation water release' level, with armouring of the slope below the bottom berm using gabions or related revetment protection measures in zones of medium to high erosion risk.

The berm should be planted with native trees (*Casuarina cunninghamiana*, *Eucalyptus camaldulensis*) on the lower berm, *Casuarina cunninghamiana* and *Acacia stenophylla* on the middle and upper berms, with the middle and upper slopes planted with grasses (*Danthonia dattoniana*, *Hemarthria uncinata*) and herbs (*Centipeda cunninghamii*, *Wahlenbergia fluminalis*, *Rununculus inundates*).

Note: This schedule needs to be reviewed in the light of Council and MCMA river bank planting schedules / practices.

b. Moderate slope

The moderate slope is a much more friendly landscape in respect to scale, ease of movement, proximity of the berms to the river, and vegetation values. The moderate slopes and multiple berm access, facilitates maintenance of these slopes.

Concepts / options:

- Use of gated structures to provide visual and movement connectivity between the city and the riverine zone;
- some set-backs of levee location, to accommodate activity nodes adjacent to the river; and
- introduction of some variation in levee form and alignment (where erosion hazards permit), to enhance the visual/landscape values of the river corridor and activity zones.

Selected thinning and replanting of the berms and slopes, as for the steep slopes above.

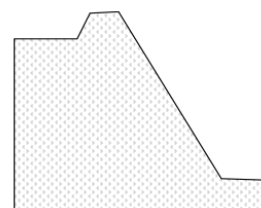
c. Gradual slope

This category relates primarily to the Cross St to Sturt St - Cabarita Park & Caravan Park area. In this case, the levee is set well back from the river bank, offering opportunities for river bank based activities and landscapes.

Concepts / options:

- recovering the area as a riverine – parkland area, for walking / contemplation, as well as river based recreational activities;
- maximise the natural opening to the river afforded by the elevated knoll in this location;
- mould the levee into the Cross St knoll at the southern end;
- some reshaping of the land form adjacent to the river bank to provide a more natural – softer appearance;
- replace the concrete wall Johnston St to Sturt St with a earth bank levee, moulded to tie into the levee north of Sturt St.

Existing earth levee & concrete retaining wall



Existing slope

Above: Preliminary concepts: Steep slopes

Replace earth berm by concrete wall, sheet steel piling or gate structure

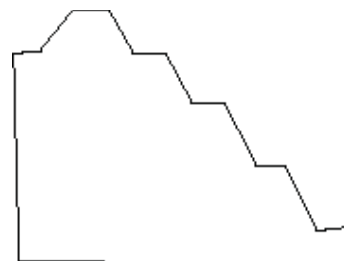
Addition of berms & trees



Gabion

Modified Arrangement

Levee set-back from bank



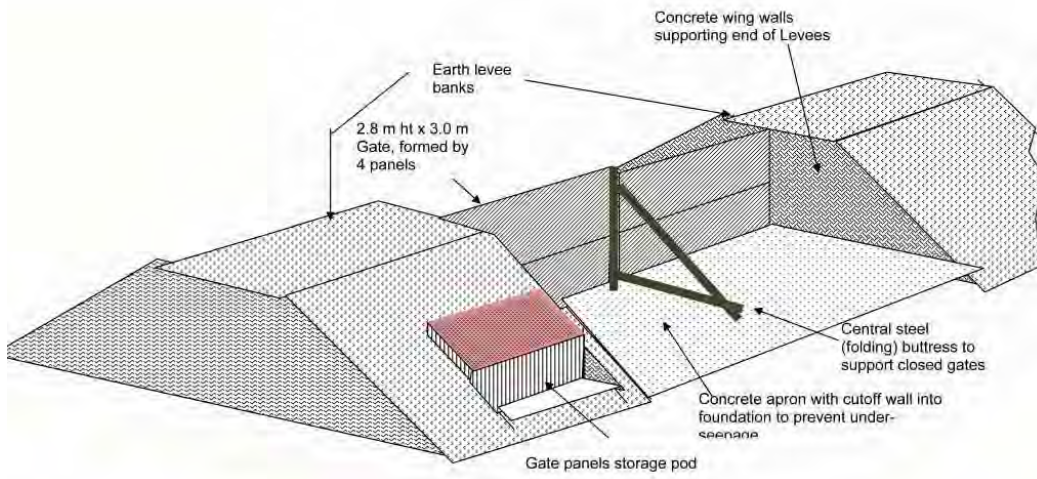
Existing slope

Above: Preliminary concepts: Moderate slope



Modified Arrangement

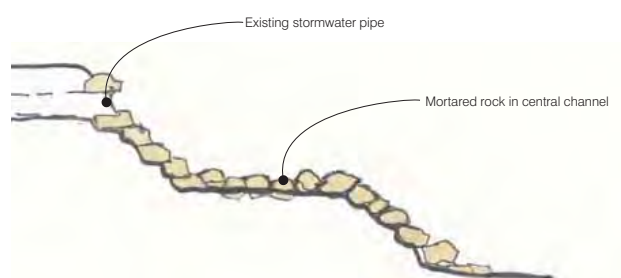
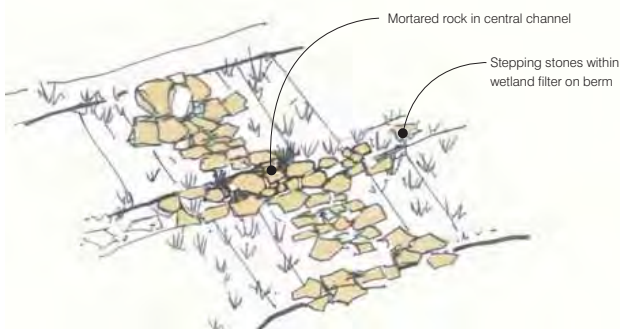




Above: Sketch of possible Flood Levee Gate arrangement. The introduction of such type of gates would allow increased urban and visual permeability to the river.

d. Integration of rock cascades

The opportunity to enhance the stormwater outlets within these river banks is discussed in the next section of the report. The sketches below illustrate the nature of the proposed rock cascades for the stormwater discharge pipes where erosion and high velocities are present.



Left: sketches of proposed rock cascade treatments to stormwater outlets within the river banks, to reduce velocities, and enhance landscape /recreational values.



Opportunities for streetscape
WSUD initiatives: swales / biofilters



Existing lagoon



Existing wetland



Existing stormwater pipes



Clean stormwater prior to release to river / lagoon



Stormwater cascade / bank erosion protection



sustainable water opportunities
Potential zones for integration of Water Sensitive Urban Design



SUSTAINABLE WATER OPPORTUNITIES

Potential economic benefits of Water Sensitive Urban Design

While the Murray Darling Basin Authority has announced the development of a Water Allocation Basin Plan which will integrate groundwater with surface water allocations, the current MDBA Cap surface water allocation is limited to the 1993/94 level of water use. WWCC indicated that the groundwater source is currently being seriously drawn down (refer to Attachment A for background on the Wagga Wagga groundwater aquifer). Future access to water is becoming a significant sustainability issue for Wagga Wagga.

Wollundry Lagoon provides Council with a significant potential source of water for parks and sportsground irrigation over summer periods. Summer drawdown of Wollundry Lagoon requires top-up from bore water, in order to maintain irrigation water levels. It is probable that the summer drawdown of the Lagoon reflects evaporation losses and groundwater drawdown. The promotion of infiltration across the city area would ensure protection of water quality of Wollundry lagoon, and the sustainability of a stormwater abstraction system. viz: there are significant economic benefits associated with the application of WSUD across the city area.

Range of appropriate WSUD measures

The Wagga Wagga city area already has a number of ponds, lagoons and wetlands dispersed across the area, including Wollundry Lagoon, Tony Ireland Park lagoon, Flowerdale Lagoon, Olympic Highway Lagoon, Wollundry Lagoon, and the Bentley Place Lagoon, in addition to the river floodplain anabranches.

The lagoons, wetlands and swales provide the potential for a powerful visual cue linking the city with the river, and attractive movement corridors enhancing that linkage. A number of park / reserves, and wide streets offer the potential for development of wetlands and swales expanding the current system of lagoons.

In responding to Climate Change, a number of urban constituencies are now modifying their urban ponds and wetlands, to incorporate significant 'ephemeral wetland' zones, ensuring maintenance of landscape values, and efficient use of dwindling water resources. Stormwater pollution control ponds and wetlands are being designed as extended detention systems, with significant ephemeral wetland zones.

The bulk of the WSUD measures are surface water based. The reticulation of the Riverside area with stormwater pipes limits opportunities in the short term to intercept stormwater runoff. However, as part of re-development, and a program of local disconnection from stormwater pipes, enhanced surface water runoff will be possible.

Combined swales and biofilters are emerging as a valuable means of filtering water, prior to discharge to wetlands or lagoons, or infiltration into the groundwater system. The strong vegetation associated with these linear systems maintains the sense of a stream, even in dry periods when there is no surface water ponding.

In summary, there is an opportunity to build on existing wetlands, lagoons and drainage systems to consolidate strong visual and drainage lines, linking the city and the river. WSUD measures will play a significant role in facilitating the establishment of these landscape and movement corridors.

There is also opportunity to introduce areas of permeable pavements within the civic areas and streetscapes to reduce velocities of stormwater, increase infiltration where appropriate, and to provide variety in pavement design to designate car parking areas.

Wagga Wagga Riverside Master Plan: Stormwater Outlets Options

Currently, there are some 20 stormwater pipes discharging onto the river banks. The drains are fitted with gates for closure during river flood events, preventing backflow of river water into the levee protected parts of the city.

The drain outlets are typically some 4 to 5 metres above the river bed, with erosion of the bank caused by the stormwater discharge. Where the stormwater collector channel runs across flat berms, there is often erosion caused by longitudinal flow of the river during high flow events.

Works are required to stabilise these areas, and provide a discharge arrangement that will minimise the potential for future erosion.

From a landscape perspective, the drain outlets are a significant feature encountered by walkers along the berms or levee. The current condition of the outlets detracts from the natural beauty of the area. The drain outlets also provide an opportunity to introduce cascades and rivulets into the river bank, which in association with riparian vegetation, would significantly enhance the landscape and recreational values of the river corridor.

In order to minimise the potential for longitudinal erosion by elevated river flows during flood events, the drain outlet features will need to be shallow, and therefore wide to accommodate storm discharges without spill onto unprotected earth embankment.

The slope cascade could comprise either:

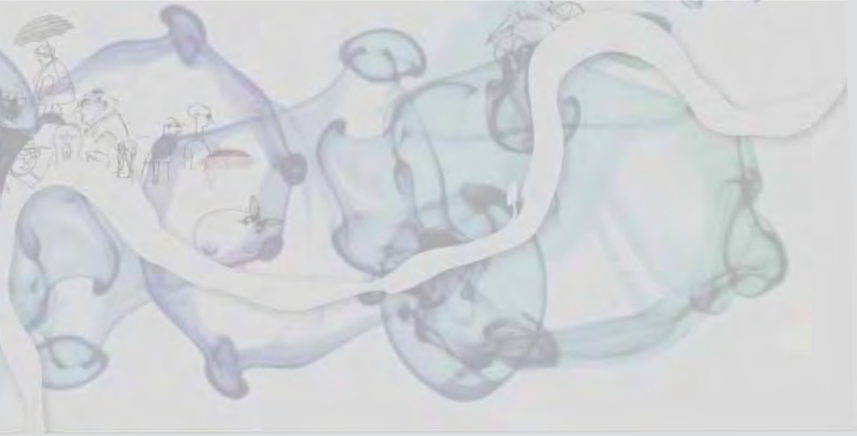
- a series of steps within a shallow concrete channel, with dissipation of flow energy as stormwater tumbles down the cascade; or
- a rock cascade, with larger open rocks on the surface to dissipate energy as the stormwater tumbles down the cascade. (refer previous pages for illustration)

The crossing of the horizontal berms along the river bank could comprise either:

- shallow concrete or mortared rock channel with stepping stone crossing; or
- a collector pool connecting into a narrow swale or linear wetland running along the berm, ultimately turning to again cascade down the next slope. A light wooden bridge might be used for crossing the swale/wetland. This option would require a wider berm than for the simple channel crossing above.



Examples of infiltration area/bio-filter in rock mulch (above) and vegetated swale in median to intercept and clean stormwater. (right)



c1964 Courtesy Wagga Wagga City Library Local Studies photographic collection



RIVERSIDE PRECINCTS

WIRADJURI / WILKS PRECINCT

These two major open space reserves provide wonderful opportunities for predominantly informal recreation for the Wagga Wagga and North Wagga residents, focused on ecological restoration of the river corridor. As they are both within the Braided River Floodplain of the Murrumbidgee River they are therefore restricted in terms of future developments etc. Both parks present different opportunities and are discussed separately below.

Wiradjuri Reserve

This reserve is the most distant from the city centre, to the north and is connected by a linear green belt beside the river and the road systems. The original people of the general Wagga Wagga area are the Wiradjuri, one of the many indigenous groups of Australia. This reserve marks the far north west section of Riverside and strategically will create a significant green link further around the river towards the future potential wetlands of the Sewerage Station and continuing west along the Wiradjuri Walking Track. The area is poorly managed with uncontrolled vehicular access, yet it has a wonderful presence. It's remoteness and landscape dominant setting on the river bend are unique characteristics which require careful management and planning.

For at least 40,000 years the Wiradjuri have been custodians of this part of the country, nurturing it, creating language, customs, stories, music and dance whilst seeking knowledge, happiness and leading a spiritually based life. (A Guide to Wiradjuri Places of Wagga Wagga) WW LALC.

Traditionally, Wiradjuri lived in harmony with the environment using only what was needed from the land. Extended family of kinship groups travelled in response to seasonal availability of food, medicines, technological resources and cultural responsibilities. (A Guide to Wiradjuri Places of Wagga Wagga) WW LALC.

Wiradjuri Reserve is a traditional Wiradjuri camping place with access to the riverside, beach and shallow water. It has in recent years been over run by vehicles and suffers from erosion, multitude of tracks and disturbed vegetation.



The area is within the section of braided river floodplain as shown in the plan "Geomorphology", and the distinct formations through the site provide visual and ecological interest. These braided river channels "are dynamic changing systems, with deposition of sediment creating bars, and erosion of banks creating new channels" (Ian Lawrence).

These areas should be left as they are, to continue their processing over time, as any intervention in part of this system would lead to a new equilibrium in respect to the pattern of deposition and erosion.



Existing picnic facilities

At Wiradjuri Reserve, beside the existing toilet block, are a few barbecues under a shade structure, within an area of cut grass beneath the canopy of large River Red Gums.



Unplanned/uncontrolled vehicular access

The multitude of tracks has created many eroded and environmentally depleted areas that impact upon the otherwise pristine character of the landscape.



Wiradjuri Walking Track; Wiradjuri Reserve forms a key link in the existing Wiradjuri track; this photo shows the link from the Reserve along the river corridor to the north west of the site.



Park Entry / Exits



Main Visual Detractors



Steep Slopes



Wiradjuri Walking Track



Facilities



Open Areas



Levee



Higher ground in relation to surrounds



Ephemeral wetland systems



wiradjuri / wilks analysis



Wiradjuri Reserve

Other key issues relating to the Reserve are the visually enclosed space west of the entry road that was the previous excavation site used for levee material, and as such is now a relatively flat area used as a playing field. Other possible uses may be suitable in this large enclosed space.

There is little high ground that would be suitable for additional picnic and recreational facilities and the steep banks to the east also require attention to prevent future under-cutting.

The highly valued landscape elements are the mature River Red Gums, the braided floodplain character; the somewhat "pristine" spiritual nature of Wiradjuri Beach setting, and the characteristic bend in the river, highlighted with the two islands that provide bird refuge. The perhaps greatest opportunity is to integrate Wiradjuri themes into the planning and design in a collaborative way with the Aboriginal custodians of the land.



This broad flat area west of the existing road entry is visually secluded and was the borrow pit for the levee construction. The belt of Eucalypts against the roadway provide effective screening to the site; it should be considered for a low-impact use within the river corridor. The area is currently used for playing fields.



Wiradjuri Beach is a secluded area, contained visually by vegetation, and without built form in sight. This view is across to Wilks Park and the islands to the left provide essential ecological refuge for waterbirds.

Wilks Park

This park is adjacent to North Wagga Wagga and like Wiradjuri is within the Braided River Flood Plain of the Murrumbidgee River. Opportunities exist to better integrate it visually and physically with the residences of both North Wagga Wagga and the city area.

The area has suffered from environmental degradation from past activities, especially cattle yards, grazing and uncontrolled 4WD and trail bike access. The large open space adjacent the road suffers from uncontrolled vehicles and requires amelioration.

Similar to Wiradjuri there are some areas of deeply incised flood channels through the northern section and an area of wetland grasses that has been re-vegetated in recent years. Potential exists to further reinforce the wetland / drainage system and to assess opportunities for educative trails etc.

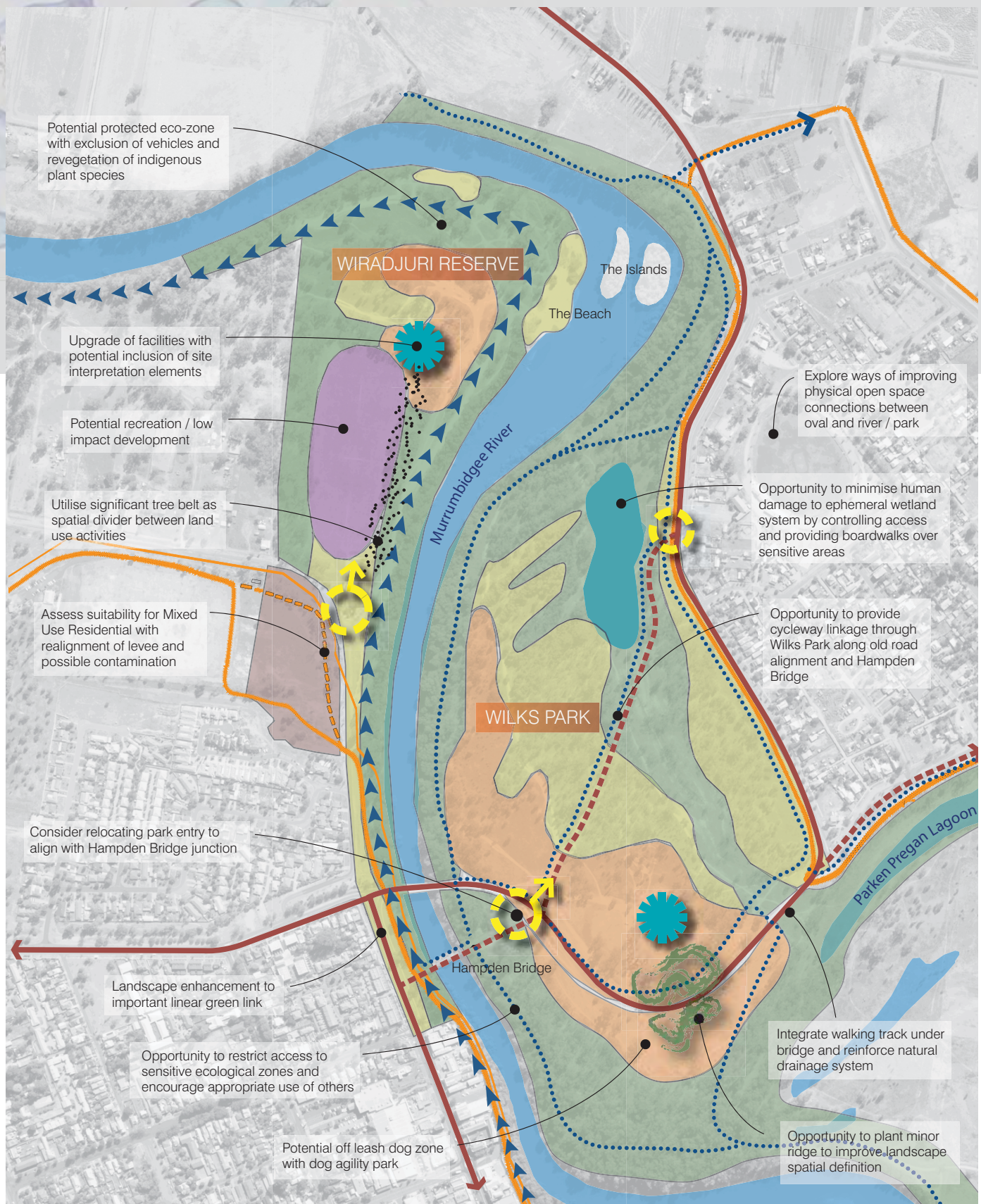
Key to the long term success of planning for this park is to improve connectivity between North Wagga Wagga settlement and the open space corridor.



Line of existing 4WD track over the undulating topography of the flood channels. This road marks the previous alignment of the old road through this area, yet in the future it should be abandoned due to erosion and impact on the landscape setting.



Cyclist riding through one of the lower lying areas of the floodplain.



- Environmental protection - Restricted use and low management
- Middle ground - Low use and management
- Higher ground - low use and management with pockets of moderate use
- Areas for low impact development / enhancement
- Potential mixed use development site
- New / enhanced park entry / exits

- Upgrade facilities
- Enhance pedestrian amenity along Wiradjuri Walking Trail
- Potential recreational / pedestrian loops
- Existing bicycle route (identified in 1997/98 plan)
- Existing levee



wiradjuri / wilks opportunities & constraints



WIRADJURI / WILKS PRECINCT

Opportunities and Constraints

To properly manage the landscape zones within these parks, it is essential to respond appropriately to the sensitive floodplain environments. The Legend is further described below.

HIGHER GROUND

Corresponds with Natural Focus (Landscape Management Zones)
Higher ground with low use and management
with pockets of moderate use

- Important buffers to river corridor with moderate exposure
- Re-vegetation of indigenous species
- Restricted cycle and equestrian use
- Easy walking trails
- Minimal structures
- Limited, low impact picnic areas
- Limited car access
- BBQ and picnic facilities

MIDDLE GROUND

Corresponds with Environmental Recreation (Landscape Management Zones)
Middle ground with low use and management
i.e. between sensitive ecological areas and areas of moderate use.

- Areas with moderate conservation value
- Ecological corridors / buffers to other sensitive areas
- Re-vegetation of indigenous species
- Pedestrian trails
- Restricted equestrian trails
- Restricted cycle use
- Environmental interpretation
- Bush regeneration
- Service access only
- Interpretation

ENVIRONMENTAL PROTECTION AREAS

Corresponds with Environmental Protection (Landscape Management Zones)
Restricted use and low management

- Areas of high conservation / bio-diversity value
- River bank stabilisation and lagoon / low lying ground
- Planting of indigenous plants to stabilise banks
- Wetland reinforcement and management
- No equestrian and cycle use
- Environmental interpretation
- Walking trails for moderate walkers / hikers
- Boardwalks, interpretation



Exposed, dry landscape surrounding Travers Street, southern section Wilks Park. This area is denuded by uncontrolled vehicular traffic. It is frequented by campers, 4WD, BMX bike users and day users of the river corridor.



Planning needs to ensure protection of buffers around significant mature trees through the park as they are the "nursery" for new growth of seedlings.



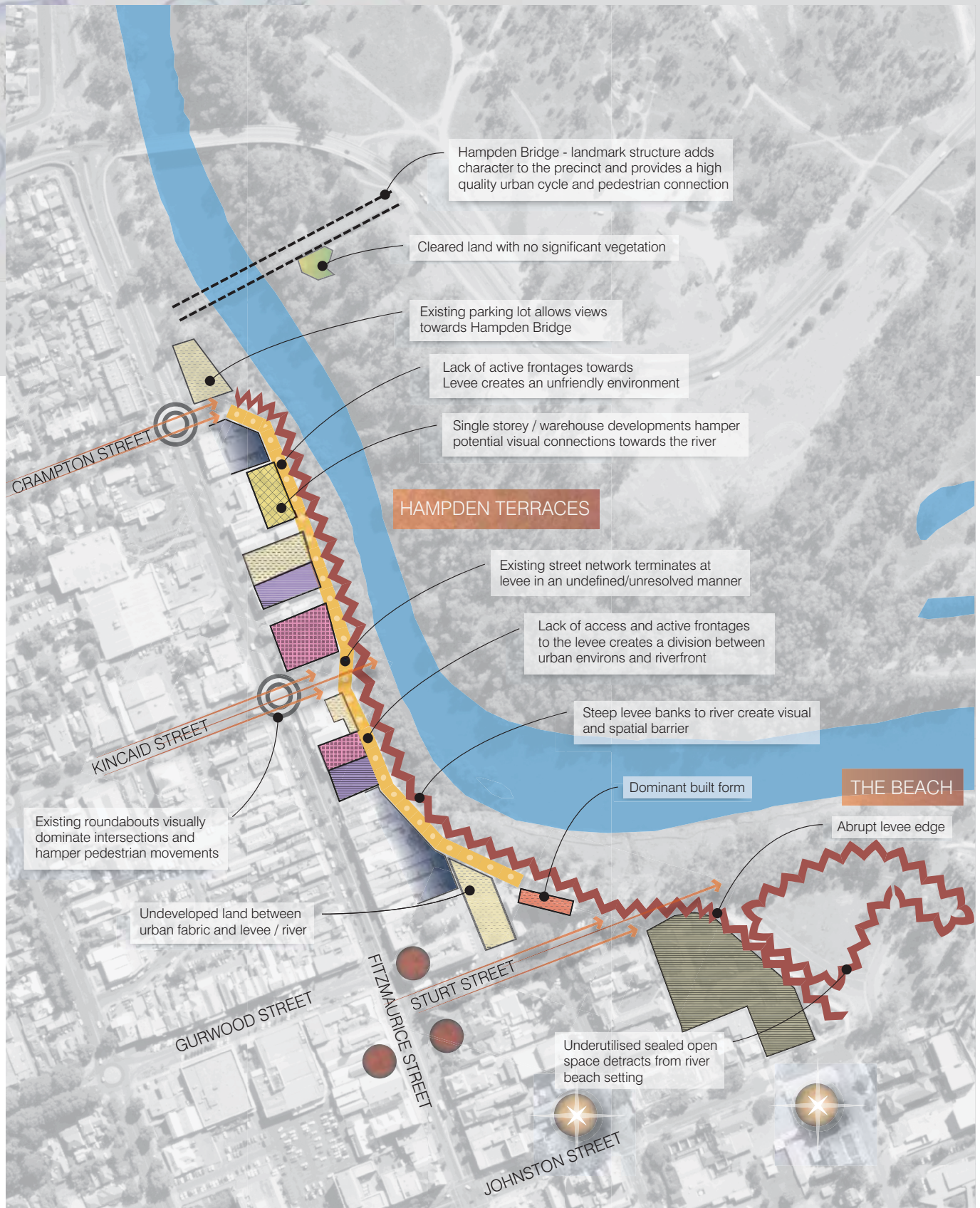
There is a need to plan an appropriate location for BMX bike users somewhere within the river corridor, where environmental impact is minimised.



Wiradjuri Reserve & Wilks Park		
OBJECTIVE	STRATEGY	DESIGN PRINCIPLE
Improve inter-relationship between Riverside and city	Create strong vegetation framework links	Instigate re-vegetation of riparian corridors to reflect indigenous patterns pre-settlement
	Create strong connectivity links	See others (connectivity)
	Introduce signage strategy	Locate signage at key areas to maximise views / park presence
Improve the quality, identity and attractiveness of the parks	Control vehicular access	Introduce “light” structures on thin columns with chain link, high kerbs, timber bollards, or rocks / planting of trees to restrict traffic
		Restrict maintenance access, and confine to areas of high ground
	Exploit the natural beauty of the site	Minimise built form in areas of natural beauty e.g. Wiradjuri Beach
	Let the landform speak - tread lightly on the earth	Minimise built form and road impacts on the floodplain environment.
		Locate caravan park in visually contained area only (Wiradjuri)
Promote environmental education and interpretation for all ages	Utilise natural assets of the sites	Provide bird hides to enable bird watching
		Re-instate wetlands where appropriate. Work with Aboriginal Elders / groups to implement Aboriginal Education trails / networks / information signage
		Explore the possibility of water features at key locations
		Establish a bush tucker trail to educate visitors and locals
		Provide tent / camper sites that capitalise on the natural setting
		Educational monitoring station (research with CSU)
		Assess suitable location for trail bikes (near Wiradjuri)
		Provide a landscape suitable for natural environmental interests - bird watching, photography, etc
	Improve self-contained traveller area (Wilks Park)	Provide improved, well designated / areas for self-contained travellers - legible open spaces with feeling of “being in the bush”
		Planting and facilities upgrade
Improve the quality of the river and its surrounding environs to encourage flora and fauna etc	Reduce steepness of batters to minimise erosion	Assess river bank stability and provide more maintainable, less erodible slopes / benches supported with indigenous planting
		Restore eroded tracks, rehabilitate with indigenous plantings
		Reinforce natural drainage systems



Wiradjuri Reserve & Wilks Park		
OBJECTIVE	STRATEGY	DESIGN PRINCIPLE
Improve connectivity / interaction between the parks, the river corridor and the city	Assess appropriateness of cycle / equestrian / pedestrian networks in parks, and restrict cycle and equestrian in sensitive environments	Provide local, indirect walking trails in Wiradjuri reserve and the eastern side of the river that manage visitors while allowing them to come close to wildlife (as opposed to direct recreation trails for joggers and cyclists) Provide equestrian trail links - North Wagga on levee; Wiradjuri through area of less environmental sensitivity
	Provide boat access to each reserve	Maintain canoe / kayak access to river for North Wagga residents and Wilks Park users. Provide formal boat access to Wiradjuri Reserve (emergency access also)
	Ensure activity generators in between park and city	Provide corner shop / caravan park entry to Wiradjuri; and bike hire for example for Wilks Park
	Improve pedestrian trails along river foreshore	Reduce impact of trail upon river banks Plan legible routes
Improve recreational facilities	Provide built structure in areas of low flood risks	Locate picnic facilities and BBQs in areas of high ground i.e.. above contour 177.5
	Provide adventure play and activity areas	Locate play equipment adjacent facilities and higher maintained park areas and on higher ground i.e.. above contour 177.5
		Incorporate exercise track with stations
Introduce sustainable initiatives	Promote pilot projects	Work with Charles Sturt University to determine appropriate research and education facilities for Riverside
	Introduce Water Sensitive Urban Design (WSUD)	Introduce riverine plantings to flood channels to strengthen indigenous landscape character No kerb and gutters to roads or carparks; use permeable surface materials and introduce swales and bio-retention areas to minimise stormwater run-off and clean stormwater prior to release into river
Strengthen the natural environment and reinforce biodiversity	Increase vegetation biodiversity and strengthen floodplain vegetation	Strengthen existing vegetation management plan for Wilks Park; introduce indigenous planting framework for Wiradjuri. Plant drainage channels with riparian species
	Reduce further impact on the sensitive environments	Plan and implement appropriate low impact passive recreational facilities with pockets of moderate use on areas of higher ground
	Maintain ecological corridors	Provide generous buffers to river corridor



- | | | | |
|--|------------------------|--|--|
| | Hampden Bridge | | Built Form interacting with Levee / River |
| | Significant Buildings | | Large industrial lots |
| | Roundabout | | Single storey residential development oriented away from the levee |
| | Churches | | Small residential / industrial lots |
| | Main Visual Detractors | | Unbuilt Land |
| | Inactive frontages | | |



hampden terraces analysis



HAMPDEN TERRACES PRECINCT

Existing Conditions

The plan opposite shows key spatial and visual inter-relationships within this precinct. This has been derived through an on site inspection and desk top analysis of the existing situation. The visual and spatial analysis has been evaluated in particular with a focus on the interrelationship between the city centre and the riverside.

Key Issues

Key issues identified include:

- levee acts as a visual detractor;
- interface of the local street network and riverside is severed by levee. No visual connection;
- there are no visual clues between urban structure and riverside. The city faces away from the riverside;
- existing elements that greatly contribute to the visual character of the urban form such as the Hampden Bridge are not exploited;
- lack of visual amenity along the levee walk due to its rather utilitarian character. No sense of celebration of the riverfront;
- steep banks create an eroded and unsafe appearance;
- visual links to the levee are low quality;
- poor integration of the levee into the urban form; and
- some buildings and uses visually detract from the setting and do not contribute to creating an inviting and friendly atmosphere.



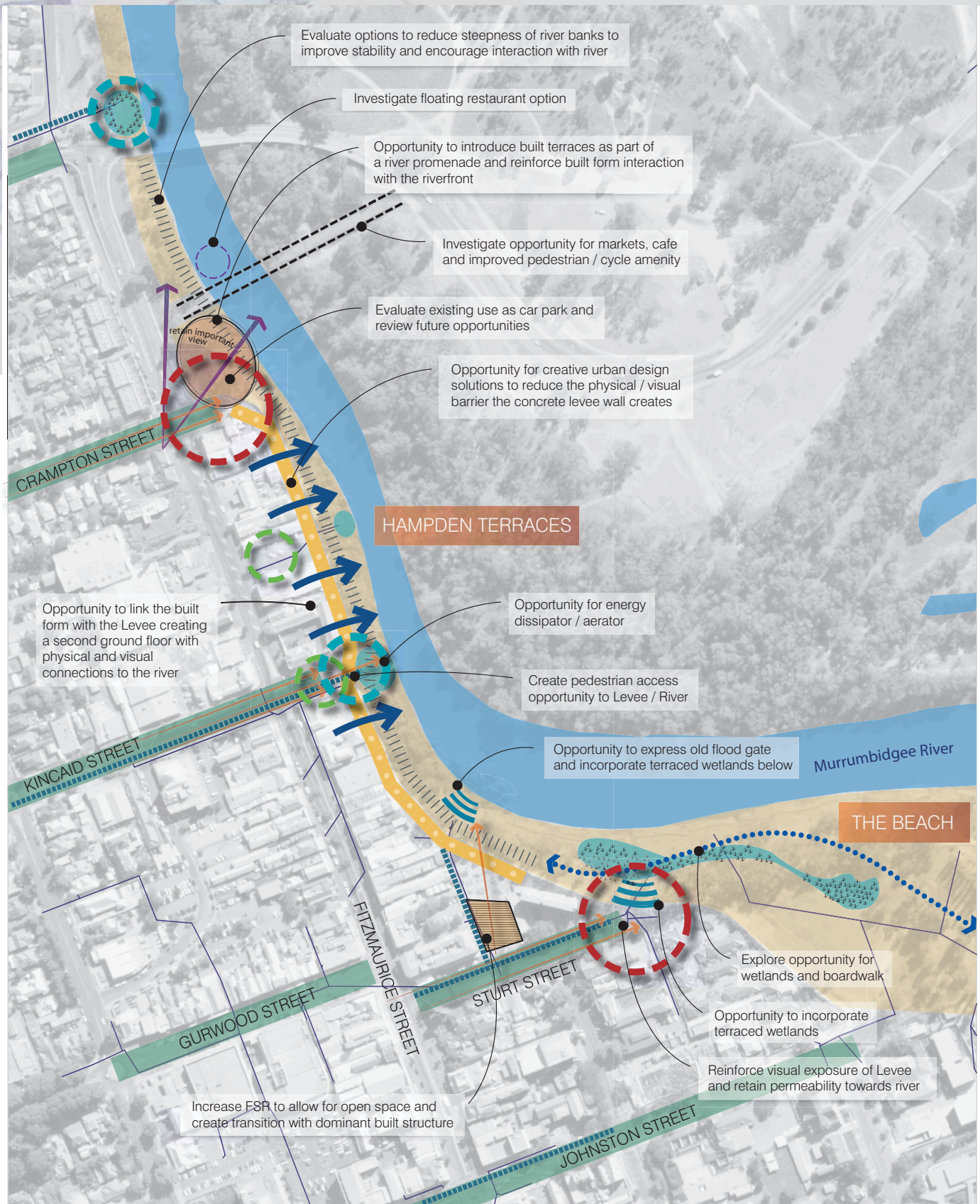
There is a strong opportunity to exploit vistas to the river such as this terrace of the Duke of Kent Hotel



This unbuilt property in the vicinity of Romano's provides a great opportunity to integrate built form and levee



The type of land uses and lack of interface between built form and levee creates an unfriendly environment



Evaluate potential to create pedestrian oriented plaza spaces to reinforce visual and physical links to the river



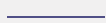
Promote permeability and access to river / levee



Opportunity to create gateway to river precinct



Opportunity for levee gate



Existing stormwater pipes



Water sensitive design opportunity: swale / channel



Wetland filter opportunity



Opportunity for cleaning stormwater prior to release into river



Enhance river foreshore



Priority streetscape enhancements to strengthen city / river connection



hampden terraces opportunities & constraints



HAMPDEN TERRACES PRECINCT

There are a number of Spatial Objectives that would reinforce and exploit the unique features of Wagga Wagga. These objectives concentrate in particular on how Fitzmaurice Street and Cadell Place interact with the levee and riverside. The objectives focus on the integration of the riverside into the urban fabric, as an inherent part of the city centre. These provide the footing for a new re-vitalisation of this area of the city centre whilst improving connections to the riverside.

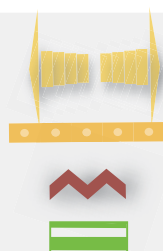
These are as follows:

- improve the identity and attractiveness of the city centre;
- improve connectivity / interaction of levee and adjacent built form, and
- improve relationship between city and river.

Hampden Terraces OBJECTIVE	STRATEGY	DESIGN PRINCIPLE
Improve the identity and attractiveness of the city centre	Exploit vistas to key landmarks	Retain significant vistas to Hampden Bridge
	Allow the Master Plan to integrate the various precincts into a cohesive urban fabric	Ensure attractors and points of interests are visible / legible within short distances
		Reinforce site specific attributes between precincts
		Evaluate built form strategies to create a stronger permeability between city centre and levee
	Create Civic and Community Spaces	Introduce plaza type spaces
	Capitalise on the Hampden Bridge as a potential iconic feature within Riverside	Introduce feature lighting at Hampden Bridge
	Celebrate the levee as a unique and inherent structure of Wagga Wagga	Introduce focal points with activities such as plazas, cafes, sculptures, beer gardens etc to create a place for people
Improve connectivity / interaction of levee and adjacent built form	Emphasise levee as an extension of the built form of the city	Integrate levee with the built form to visually interrupt its continuity and improve permeability
	Create comfortable access to levee walk	Reduce height of levee walk to improve access from the city
	Make the levee a feature and a positive element	Introduce public art or feature treatments along the wall
		Improve its architectural appearance and de-emphasise its infrastructure character
Improve inter-relationship between Riverside and city	Introduce the element of water at key locations to echo the river behind the levee as a visual cue	Introduce wetlands as sustainable streetscape measures
		Explore the possibility of introducing sustainable water aeration elements at key locations
	Open up views towards river at key locations	Introduce openings / gates that can be closed in the event of flooding
	Allow the urban / built form to extend past the levee and interact with the river as accent	Introduce feature terraces at key locations to create places along networks
	Reinforce the Riverside presence	Extend the riverine vegetation into the city through streetscape enhancements



- Churches
- Civic Centre
- Civic Theatre



- Critical linkages
- Inactive frontages
- Visual detractors
- Identified need for remediation

- Buildings that enhance streetscape character
- Undeveloped Land
- Land with potential for major community facility development



the bend analysis



THE BEND PRECINCT

Existing Conditions

There is an opportunity to spatially redefine the area between Wollundry Lagoon and the Riverside, as well as improving the key landform feature- the “bend” of the river, i.e. in the area around the existing caravan park and the beach. The links between the city and the river are poor, mainly as a result of the levee, landuses and buildings. The visual and spatial analysis has been evaluated with a focus on the interrelationship between the Civic Centre, Wollundry Lagoon, the Church Precinct and the riverside.

Key issues identified include:

- lack of vistas and view corridors towards key landmarks such as the church spires;
- lack of cohesive structure of the built form to assist in orientation and city structure;
- visual discontinuity between open spaces;
- lack of visual interaction between city centre and riverside. This is particularly exacerbated by the existing levee;
- poor integration of the levee into the urban form and topography / landscape;
- buildings and land uses block vistas and views such as caravan park, Playhouse etc;
- disparate land uses discourage a legible structure and way finding; and
- wide roads emphasise vehicular traffic and create the appearance of a harsh environment.



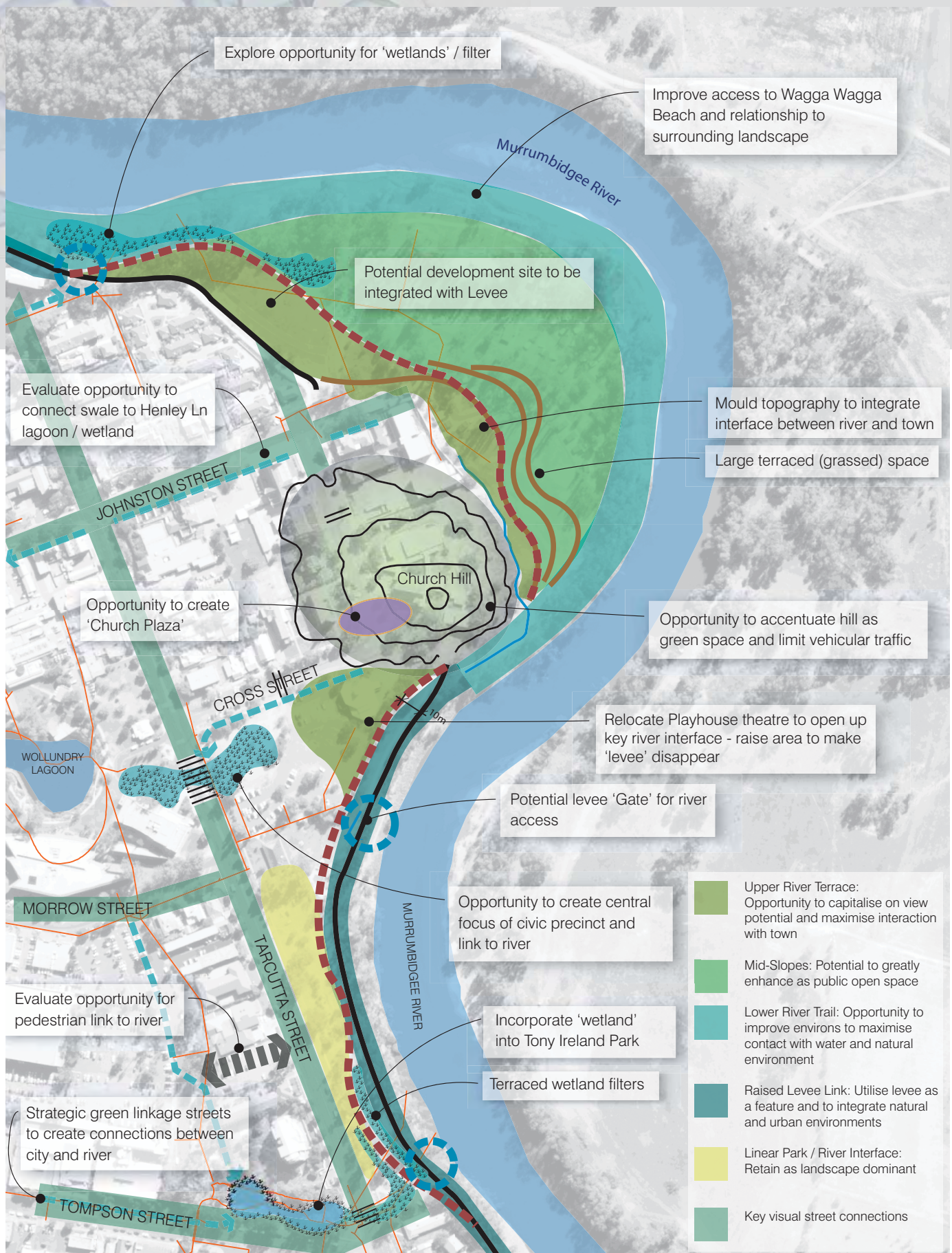
Above: Views towards church spires should be reinforced to express a key quality of the character of Wagga Wagga.



Above: The car park at Wagga Beach is a dominant feature that strongly detracts from the setting and compromises the spatial connectivity with the city.



Above: The Civic Centre and Civic Theatre provide a key anchor to this precinct which the Master Plan should build on.



the bend: landscape and water opportunities & constraints



THE BEND PRECINCT

There are a number of Spatial Objectives that would reinforce and exploit the unique features of Wagga Wagga. These objectives concentrate in particular on how the city centre is perceived and focus on the integration of Riverside as an inherent part of the city centre. This provides the footing for articulating the identity of Wagga Wagga and its riverside. These are as follows:

- improve the identity and attractiveness of the city centre; and
- improve the legibility and way finding within the city centre and riverside.

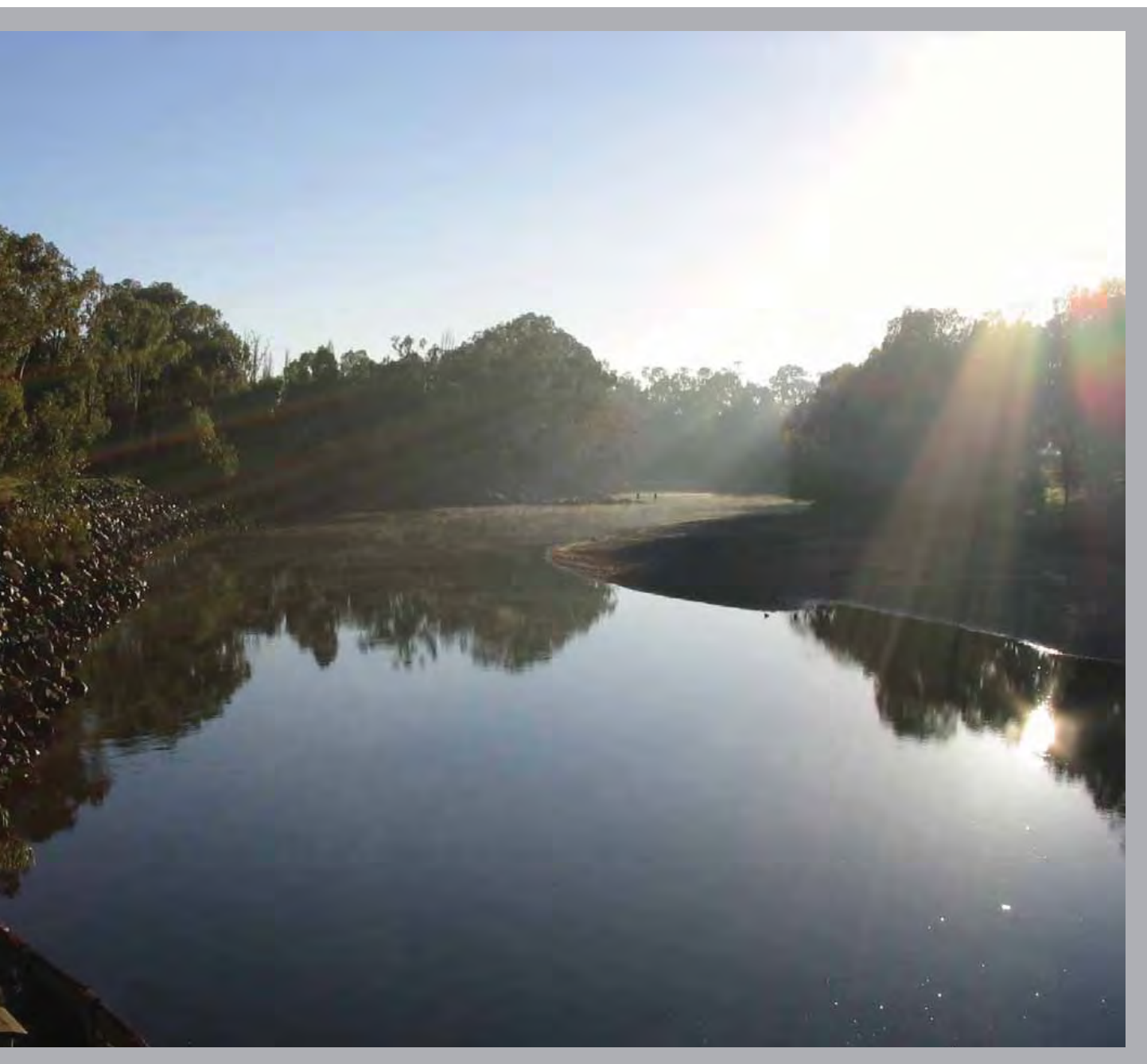
The Bend OBJECTIVE	STRATEGY	DESIGN PRINCIPLE
Improve the identity and attractiveness of the city centre	Exploit vistas to key landmarks	Retain / create open space corridors that allow significant vistas to be retained
		Improve and protect views of the churches on the peninsula
	Allow the Master Plan to integrate the various precincts into a cohesive urban fabric	Reinforce site specific attributes between precincts
		Link church precinct with the Civic Centre / city Centre through open space and vistas
	Create Civic and Community Spaces	Introduce and formalise areas of assembly
		Introduce plaza type spaces
	Spatially and visually integrate the Wollundry Lagoon with the riverside	Introduce water elements (ephemeral or fixed) where possible; or as a minimum, planting to reflect riverine species to visually extend the lagoon towards the river
Improve the legibility and way finding within the city centre	De-emphasise local roads and streets and emphasise alternative modes of transport such as walking	Reduce widths of streets
		Introduce blisters at key locations
		Introduce raised thresholds in key areas
Improve relationship between city and riverside	Visually reinforce key streetscapes along desire lines	Introduce landscape and streetscape strategies and de-emphasise the vehicular environment
		Introduce a raised threshold of considerable length to create a pedestrian oriented space
Improve relationship between city and riverside	De-emphasise levee as a built barrier	Integrate levee with the built form to visually interrupt its continuity
		Meander the alignment of the levee to create a softer appearance



The Bend OBJECTIVE	STRATEGY	DESIGN PRINCIPLE
Improve the quality of the micro-environment within the city centre	Exploit the natural beauty of the site	Re-instate wetlands where appropriate
		Introduce WSUD measures that beautify streetscapes and improve legibility
	Reduce or slow down traffic along Tarcutta Street to improve noise ambiance	Introduce raised thresholds
		Reduce the apparent width of the street
	Reduce flooding risks	Identify opportunities that allow for potential future controlled flooding
Improve the quality of the river and its surrounding environs to encourage flora and fauna etc	Reduce steepness of batters to minimise erosion	Introduce retaining walls to reduce the height of fill
		Investigate moving levee to improve slopes, and introduce indigenous planting to river banks
	Introduce native species and eliminate exotics in a staged process	Reinforce indigenous plant species
		Remove unhealthy exotic trees; retain culturally significant species
Introduce sustainable initiatives	Promote a greener environment	Introduce development controls that include rooftop gardens and green roofs
	Reduce carbon footprints	Promote community and market gardens
	Promote pilot projects	Work with Charles Sturt University to determine appropriate research and education facilities for Riverside – in particular WSUD potential.
	Introduce pedestrian oriented strategies	Create plaza type spaces with raised thresholds
	Introduce WSUD	Streetscape enhancements to minimise stormwater run-off
		Convert piped drainage to above ground visible swales / drainage where feasible to increase legibility of drainage systems



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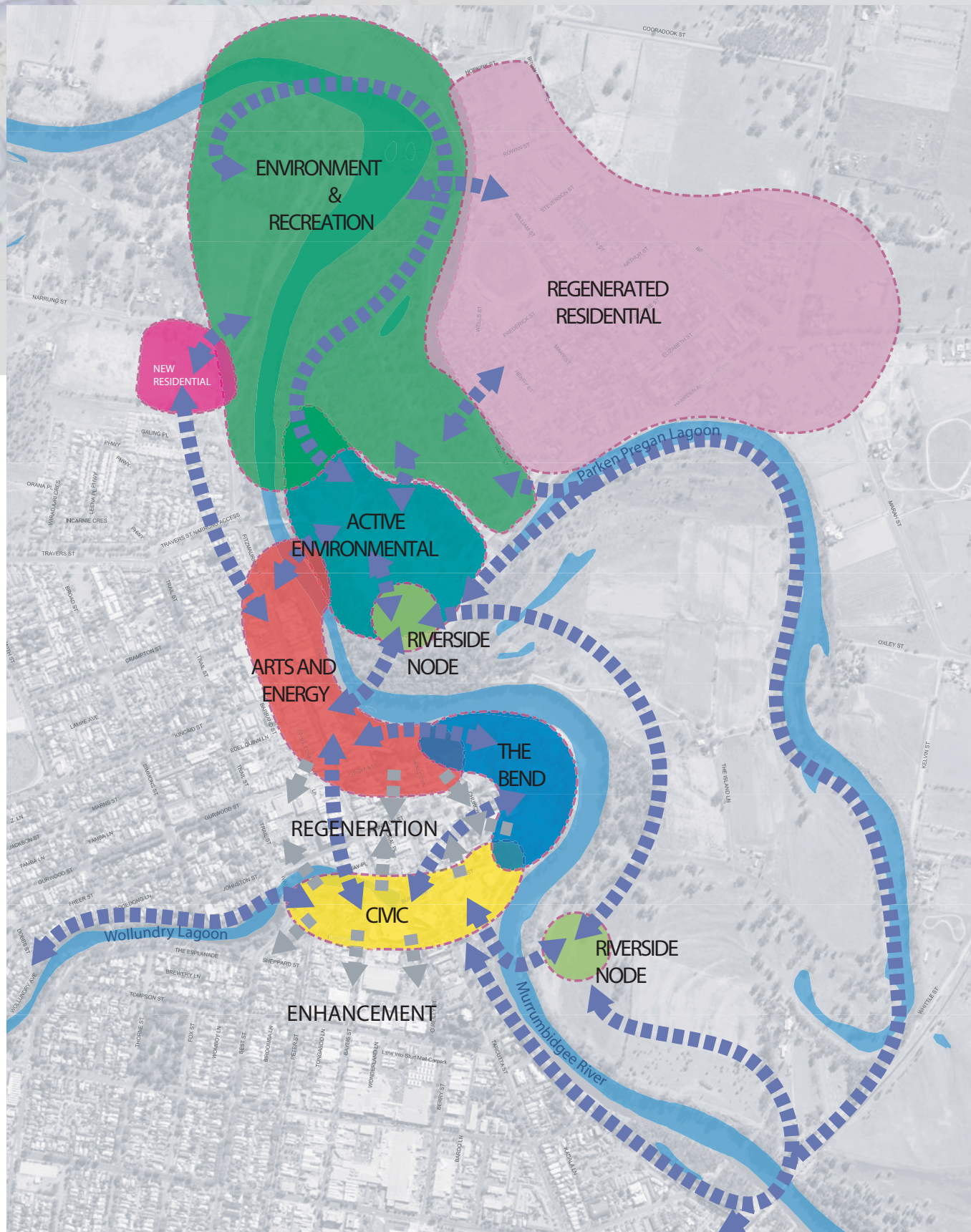


STRATEGIC FRAMEWORK

A strategic framework has been developed to guide the resolution of the Strategic Master Plan. The framework consist of key maps and a series of tables identifying strategies and actions which are then translated into the Master Plan.

The Strategic Framework discusses five topics:

- Riverside Regeneration which focuses on the interrelationships between the various precincts, their connections and opportunities to improve areas and uses.
- Landscape Management Zones which guide the intensity of usage and management for each area within the plan.
- Land Use Strategy which identifies activities and appropriate land uses.
- Built Form Strategy which identifies key sites/areas for development in conjunction with activities and land uses.
- Movement and Access Strategy which identifies links, routes and networks for various modes of transport.



New and Enhanced Connections
and Relationships between Activity Areas



Regeneration and Enhancement
of Existing Township

Opportunities

- Create and reinforce relationships
- Improve adjacent areas and uses
- Create connections and movement



riverside regeneration



RIVERSIDE REGENERATION

The opportunity exists to use the river to create a more vibrant and enjoyable Wagga Wagga. Through the creation of a better Riverside Wagga Wagga it is possible to create a place that is greater than the sum of its parts. This will be accomplished through supporting three guiding principles for the activities along the river:

- reinforce and enhance existing patterns of activity and movement;
- link together patterns of activity along the river; and
- develop and create key spaces, activities and buildings where opportunities exist to provide new foci for activity along the river.

Not only will the adoption of these guiding principles help to create and enhance activity along the river, it will improve adjacent areas and uses and create new connections and movement.

The concept of activity areas and spaces is not about rigidly zoning uses. Rather it gives emphasis and priority to particular uses to either reinforce existing or establish new patterns of activity. This is intended to support the functionality of Wagga Wagga.

The activity areas

Environment and Recreation – an improved and enhanced Wiradjuri Reserve and environs.

Active Environmental – an improved and enhanced Wilks Park.

Regenerated Residential – a regenerated North Wagga. A place with more housing and that is an exemplar of environmentally sustainable housing which takes advantage of its close proximity to the Riverside and city centre. North Wagga will become integral to Wagga Wagga and the riverside.

New Residential – between the city and Wiradjuri Reserve. A new hub for housing and services integrating the existing city and the reserve and providing more services to the area north of Travers Street.

Arts and Energy – where the river touches the city centre. A new and invigorated arts, culture and entrepreneur precinct. Providing a new energy to Fitzmaurice Street and the riverside through the promotion and provision for arts, leisure and small scale business activities supported by accommodation and housing.

The Bend – the city's space and place of celebration. Bringing back the activities to the bend and the beach. This will be a place for festivals and celebrations as well as recreation and living on the riverside. New services in purpose built facilities will support the jazz festival and other celebrations. An extension of the escarpment on the edge of the church hill will create a city plaza overlooking the river and beach.

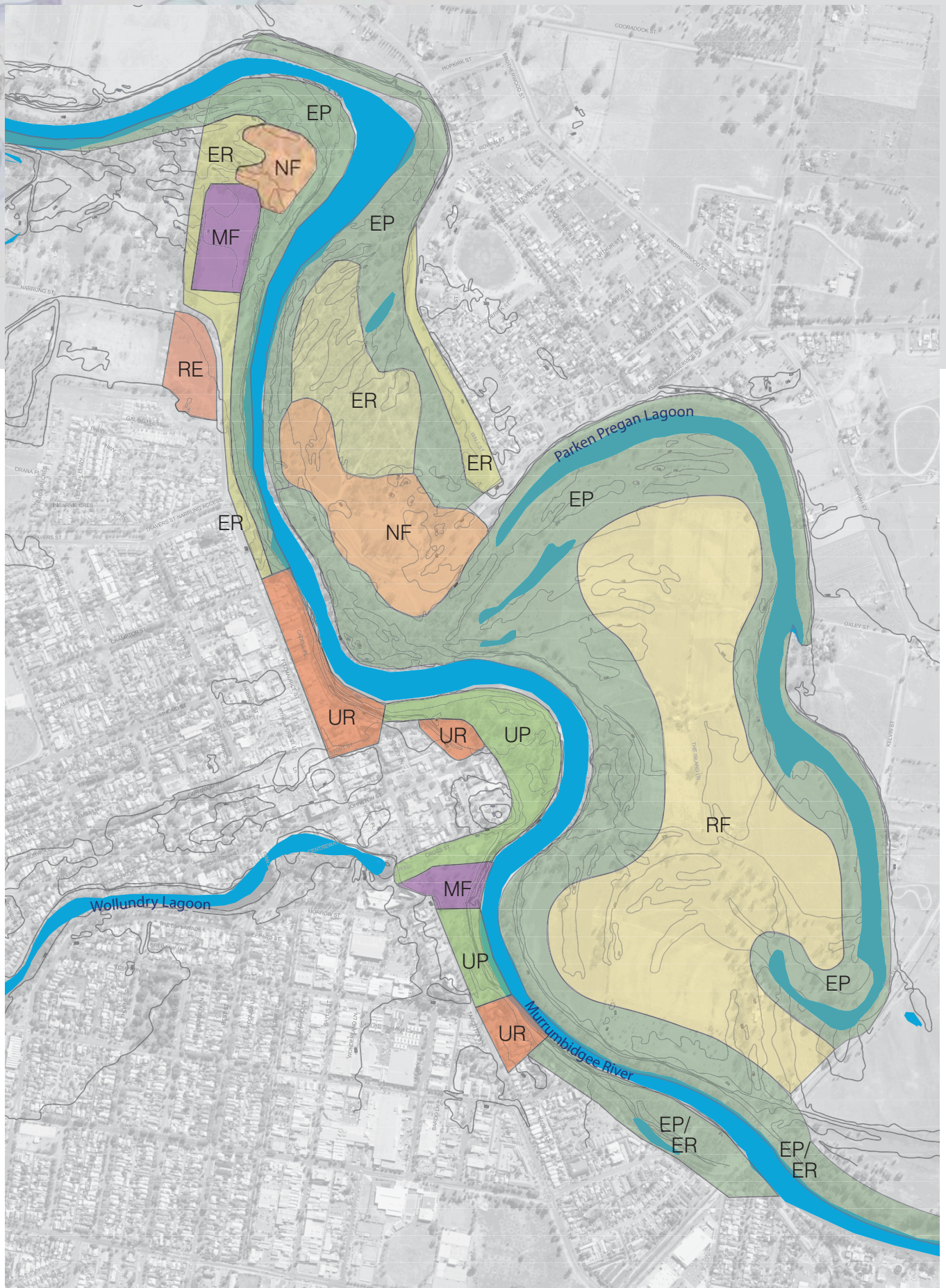
Civic – an extension to the civic heart. The civic and cultural activities of the city will touch and embrace the river.

Riverside Nodes – places on the east side of the river for people to congregate, learn about the river and recreate.

Hampden Bridge – a regenerated bridge incorporating attractions and activities.

Specific activities that are suggested for these areas include:

Environment & Recreation	• Banned 4x4 activity • Relocated Caravan Park and self-contained traveller facilities • Boat ramp (Wiradjuri Reserve) • Boardwalks and bird hides • Environmental and indigenous interpretation • Picnic and BBQ facilities • Equestrian and cycle trails in non sensitive areas
Active Environmental	• Walking, jogging and exercise tracks • Equestrian and cycle trails in non sensitive areas
Regenerated Residential	• More exemplar environmentally sustainable housing
New Residential	• A new hub for housing and services
Arts and Energy	• Celebrate the levee • Retail and cafe spaces • Studio spaces for artists • Bars and a boutique brewery • Small business incubators • Offices • Student accommodation • Hotels and serviced apartments
The Bend	• Remove Caravan Park • Upgrade Wagga Beach and reintroduce Life Savers • Grassed terraces and event space • Bike and boat hire
Civic	• Visitor Information Centre • Conference facilities • Museum • Arts Centre – indigenous arts space, black box theatre • Complementary retail and cafe spaces
Riverside Nodes	• Cycling, walking and horse riding facilities • Demonstration Farm • Community Gardens • Environmental and indigenous interpretation
Hampden Bridge	• Markets • Cafes



MF	Managed Facilities	RF	Rural Focus
UP	Urban Park	UR	Urban Rejuvenation
NF	Natural Focus	RE	Residual Land
ER	Environmental Recreation		
EP	Environmental Protection		



landscape management zones



LANDSCAPE MANAGEMENT ZONES

MF MANAGED FACILITIES

High/moderate use and management

- Regional tourist focus
- Civic focus/major nodes
- Community facilities/museum
- Managed facilities
- Car parking adjacent zone
- Bus access

UP URBAN PARK

High/moderate use and management

- Natural nodes –Wagga Beach, the Rocks
- City common /unstructured active recreation areas
- BBQ and picnic facilities
- Multi-purpose play
- Re-vegetation to river corridor
- Managed water feature
- Irrigated grass (recycled water)
- Music /band areas
- Grassed terraces for large community events
- Viewing areas
- Car and bus parking adjacent
- Limit cycle ways through this high activity area

NF NATURAL FOCUS

Higher ground with low use and management with pockets of moderate use

- Important buffers to river corridor with moderate exposure
- Re-vegetation of indigenous species
- Restricted cycle and equestrian use
- Easy walking trails
- Minimal structures
- Limited, low impact picnic areas
- Limited car access

ER ENVIRONMENTAL RECREATION

Low use and management

- Areas with moderate conservation value
- Ecological corridors/buffers to other sensitive areas
- Re-vegetation of indigenous species
- Pedestrian trails
- Restricted equestrian trails
- Restricted cycle use
- Environmental interpretation
- Bush regeneration
- Service access only
- Boardwalks, interpretation

EP ENVIRONMENTAL PROTECTION

Restricted use and low management

- Areas of high conservation/ biodiversity value
- River bank stabilization
- Planting of indigenous plants to stabilize banks
- Restrict equestrian and cycle use
- Environmental interpretation
- Walking trails for moderate walkers/hikers
- Boardwalks, interpretation

RF RURAL FOCUS

Existing rural lands

- Environmental conservation to lagoon and river edge as per Draft LEP 2008.

UR URBAN REJUVENATION

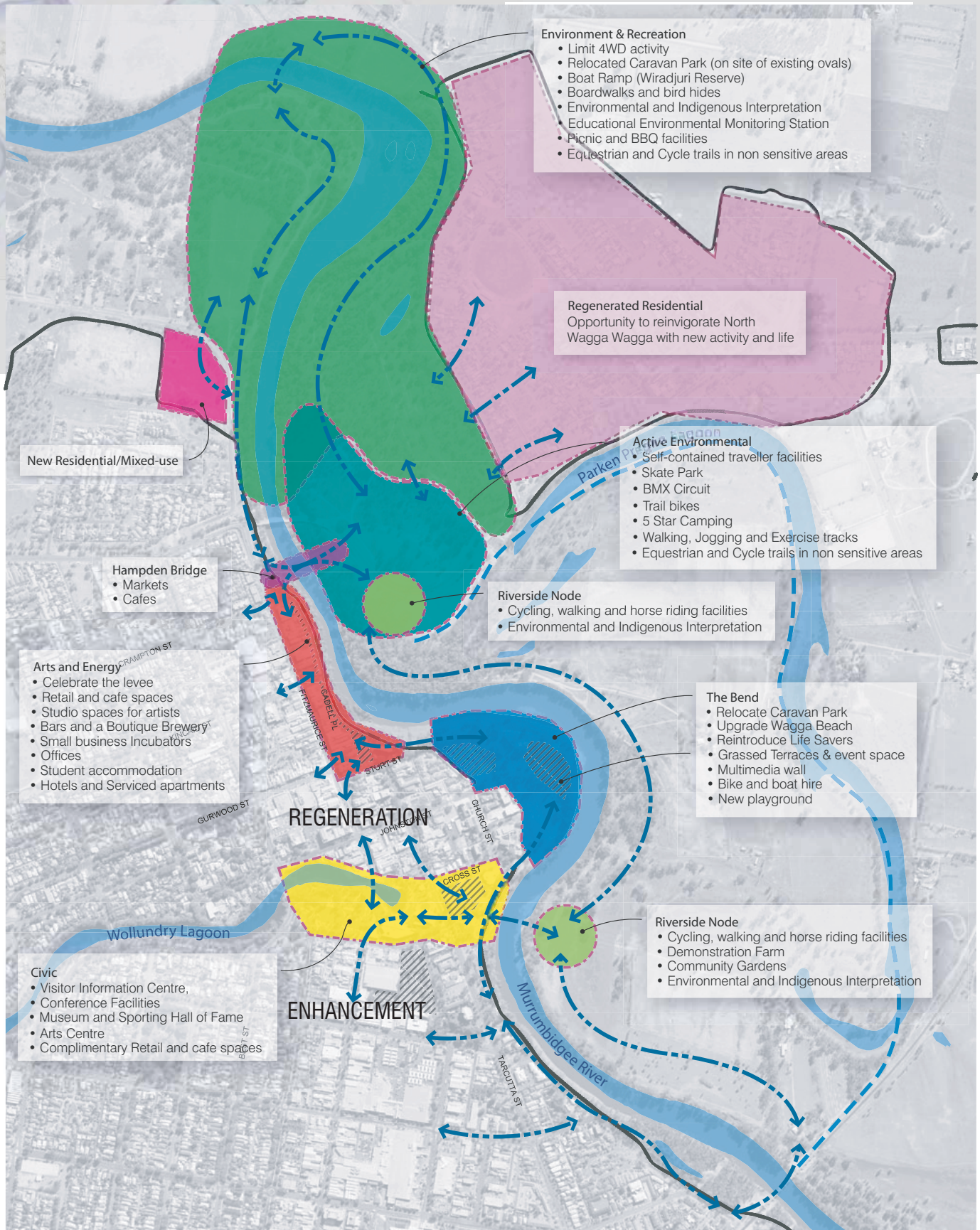
Areas where creative urban design , water , levee, land use solutions have potential to create better interfaces with river levee and river.

- Tight relationships between built form and levee
- Improve inadequate access to levee
- Potential to improve interface between city and river

RE RESIDUAL LAND

Functions as residual land separated from river and bank by roads

- Investigate long term options/viability
- Land offering potential for re-development e.g. mixed use/residential



- ←---→ Links between complementary land uses
- Underutilised spaces
- Blue Link
- Levee



land use strategy



LAND USE STRATEGY

There are a number of Land Use and Activity Objectives that will ensure Riverside Wagga Wagga becomes a more vibrant and enjoyable place to be.

These are as follows:

- to make Wagga Wagga known for its riverside;
- to create an active place;
- to create a diverse range of activities to ensure different experiences for different people in different moods at different times;
- to create a place for all people – locals and visitors alike;
- to create a safe place;
- to encourage people to linger within Riverside;
- to encourage environmentally sensitive development;
- to encourage the provision of affordable housing;
- to integrate land uses and activities to complement one another;
- to create an economically robust place; and
- to ensure the highest and best use for all areas.

The adjacent plan identifies:

- activity areas;
- links between complimentary land uses; and
- under utilised spaces

The objectives above have a number of strategies and actions associated with them to ensure the successful delivery of activities along the riverside. These are identified in the table overleaf.



Strategy	Action
Build upon the location attributes and adjacent land uses to create and reinforce precincts with new complementary activities	Amend the LEP to deliver appropriate land uses and ensure that development can occur
Deliver a parking strategy that minimises the intrusion of vehicles into inappropriate places while allowing access to the Riverside for those who need it that meets current and future demands.	Provide at grade car parking only away from the riverside and shared with other uses and ensure good connections between them and the Riverside
	Provide car parking near the Riverside in above or below ground structures
Create a place for diverse and vibrant retail and commercial activity at the Riverside that provides a range of rents	Investigate retail, artisan and cafe tenancies within, adjacent and overlooking the levee and in appropriate locations such as around the Civic Centre and Fitzmaurice Street
	Provide artisan spaces in Cadell Place
	Explore temporary uses of Hampden Bridge that may bring in income such as markets and cafes
	Encourage a boutique brewery potentially relaunching the old Wagga Wagga Federal Brewery
Create an 18 hour economy	Encourage uses that open later into the evening such as cafes, restaurants and bars both adjacent to the Riverside and in appropriate locations within walking distance
	Ensure links to and between late night activities are safe and comfortable through the provision of lighting, clear paths etc.
	Light up and celebrate key buildings and structures including the Hampden Bridge
Create destinations for social and cultural activities	Build a major community facility adjacent to the Riverside
Create opportunities for passive recreational activities	Introduce picnic shelters
	Create leafy parks overlooking the river
Create opportunities for active recreational activities	Build a new/formalised boat ramp in a location that does not detract from other uses or endanger life. For instance in Wiradjuri Reserve and not near Wagga beach
	Reinvigorate Wagga Beach and make swimming there safe and fun
	Provide facilities for clubs including rowing, swimming, canoeing and kayaking at Wagga Beach
	Provide trails and facilities for hiking, cycling and horse riding
Celebrate the natural environment	Provide controlled access to sensitive environmental locations to enable people to experience nature without destroying it such as through the construction of boardwalks and bird watching facilities walking infrastructure and bird watching facilities
	Ban 4x4 activity within open space reserves
Create a place for visitors	Build a new state of the art integrated Visitor Information Centre and Museum
	Build a new 800 to 1000 seat conference centre
	Direct visitors to the Riverside and its attractions
	Construct new hotel accommodation/serviced apartments
	Relocate the existing Caravan park to an appropriate location near compatible uses such as Wiradjuri Reserve
	Provide a formal location and facilities for the self contained travellers in an appropriate location with compatible uses such as at Wilks Park
	Provide row boat, canoe and kayak hire facilities
	Provide bike hire facilities



Strategy	Action
Create a place for people to live in	Explore non-conventional modes and models of land tenure including long term leases that may encourage the provision of a diverse mix of dwelling types across Riverside
	Provide residential (mixed use) development on underutilised sites
	Provide affordable housing or percentage of affordable housing in new developments
	Increase housing choice by providing smaller dwellings for a range of age groups and lifestyles such as students and the elderly
	Create student housing along Cadell Place
Create a place for events	Provide a facility that can be used for weddings and can link the church precinct for the ceremony and Wagga Beach for photos
	Construct grassed terraces that utilise the hillside topography of the peninsula
	Develop an events program which might include a festival of the river and/or a new space for the Wagga Wagga Jazz and Blues Festival or Food and Wine Festival
Create a place for people to work	Provide business incubator spaces in underutilised buildings
Encourage food security	Establish town/community gardens or demonstration farm for food production
Encourage people to move around Riverside	Create nodes of activity along the riverside



- Existing Landmark Building or Structure
- Opportunities for New and Improved Landmark Buildings or Structures
- Opportunities for New Built Form or Development
- Existing Buildings
- Levee



built form strategy



BUILT FORM STRATEGY

There are a number of Built Form Objectives that will ensure Wagga Wagga riverside becomes a great place to be.

These are as follows:

- to enhance the riverside with appropriate and iconic built form;
- to build appropriately in under utilised spaces and places;
- to create buildings that utilise the form of the levee;
- to create built form that follows sustainability principles;
- to create buildings that accommodate the appropriate use of the activity area; and
- to create landmarks that bring people to and along the riverside.

The adjacent plan identifies:

- existing landmark buildings or structures;
- opportunities for new and improved landmark buildings or structures; and
- opportunities for new built form or development.

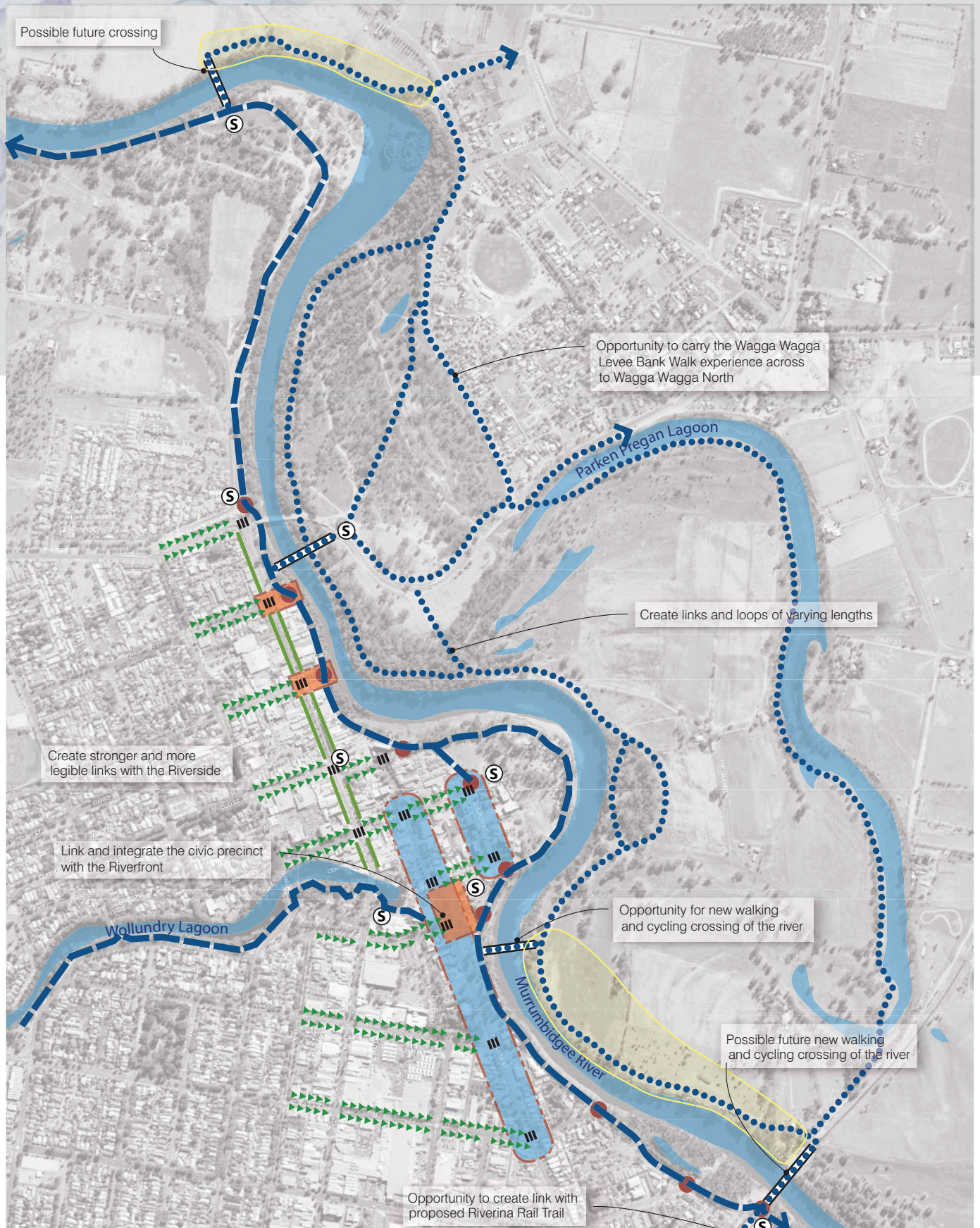
The figure lists key opportunities identified from the site analysis process. Most of these form the basis from which particular strategies and actions have been developed.

The strategies and actions are directly associated with the objectives and provide a mechanism to ensure the successful delivery of activities along the riverside. These are identified in the adjacent table.

Regarding development opportunities, riverside housing on Tarcutta Street has not been adopted due to visual impacts and the need to accommodate parking facilities for the Visitors Information Centre south of the Major Community Facility.

The other development opportunities identified have been informed by a Market Assessment Study prepared by Hill PDA to ensure consistency in land uses with the results of those investigations.

Strategy	Action
Create landmarks and iconic built forms to improve the legibility of Riverside	Create a new cafe on the restored Hampden Bridge to make this landmark structure a destination in its own right
	Build a 'landmark' hotel on the Wagga Beach car park
	Build a landmark civic building to link the civic centre to the riverside
	Provide a 'landmark' cafe structure at the Kincaid Plaza
Take advantage of underutilised space to increase activity and housing choice	Investigate mixed-use or residential uses on vacant areas adjacent to the city centre
	Increase floor space ratios, densities and activity along Cadell Place to incorporate cafes, bars, accommodation and gallery spaces
	Encourage infill environmentally sustainable housing in North Wagga
	Build on the Wagga Beach car park adjacent the existing levee
Sensitively utilise existing open spaces	Encourage suitable development on the vacant site on the corner of Cadell Place and Sturt Street
	Build pop-up cafes / activity generating facilities on the side of Church Hill overlooking the bend
Minimise impacts on the environment	Investigate areas of Wilks Park and Wiradjuri Reserve that may be able to accommodate built form
	Sensitively integrate built form in the environment
Utilise the levee to accommodate half basement car parking	Apply sustainable building techniques
	Ensure that the development on the Wagga Beach car park interacts directly with the levee top and utilises the level difference to incorporate semi-basement car parking
	Ensure that the development of the corner of Cadell Place and Sturt Street interacts directly with the levee top and utilises the level difference to incorporate semi-basement car parking
	Bridge the gap between the civic centre and levee top with a new civic building with basement car parking



- New/Improved access to Levee top
- III Improved pedestrian connectivity
- — — — — Improve walking track
- ● ● ● ● Create new paths
- = = = Improve/construct river crossing for pedestrians and cyclists

- S Wayfinding Signage
- Create a plaza link
- Improve pedestrian amenity
- ▶ ▶ ▶ ▶ ▶ Landscaping to create legible link to Riverside
- — — — — Shade trees
- Private Ownership



movement and access strategy



MOVEMENT AND ACCESS STRATEGY

There are a number of Movement and Access Objectives that will ensure Wagga Wagga Riverside is better linked to the city. These are as follows:

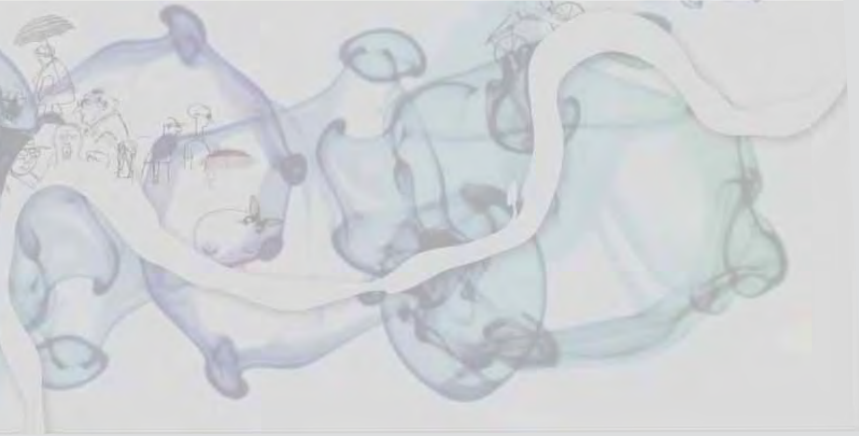
- to create a connected place that is used by many people;
- to create a place that is connected to the wider region;
- to create a place that is accessible for all ages and abilities; and
- to create a place that enables and promotes sustainable movement patterns.

The adjacent plan identifies:

- potential paths and enhanced links;
- improved landscaping;
- new river crossings;
- new plaza spaces; and
- signage opportunities.

The objectives above have a number of strategies and actions associated with them to ensure the successful delivery of activities along the riverside. These are identified in the adjacent table.

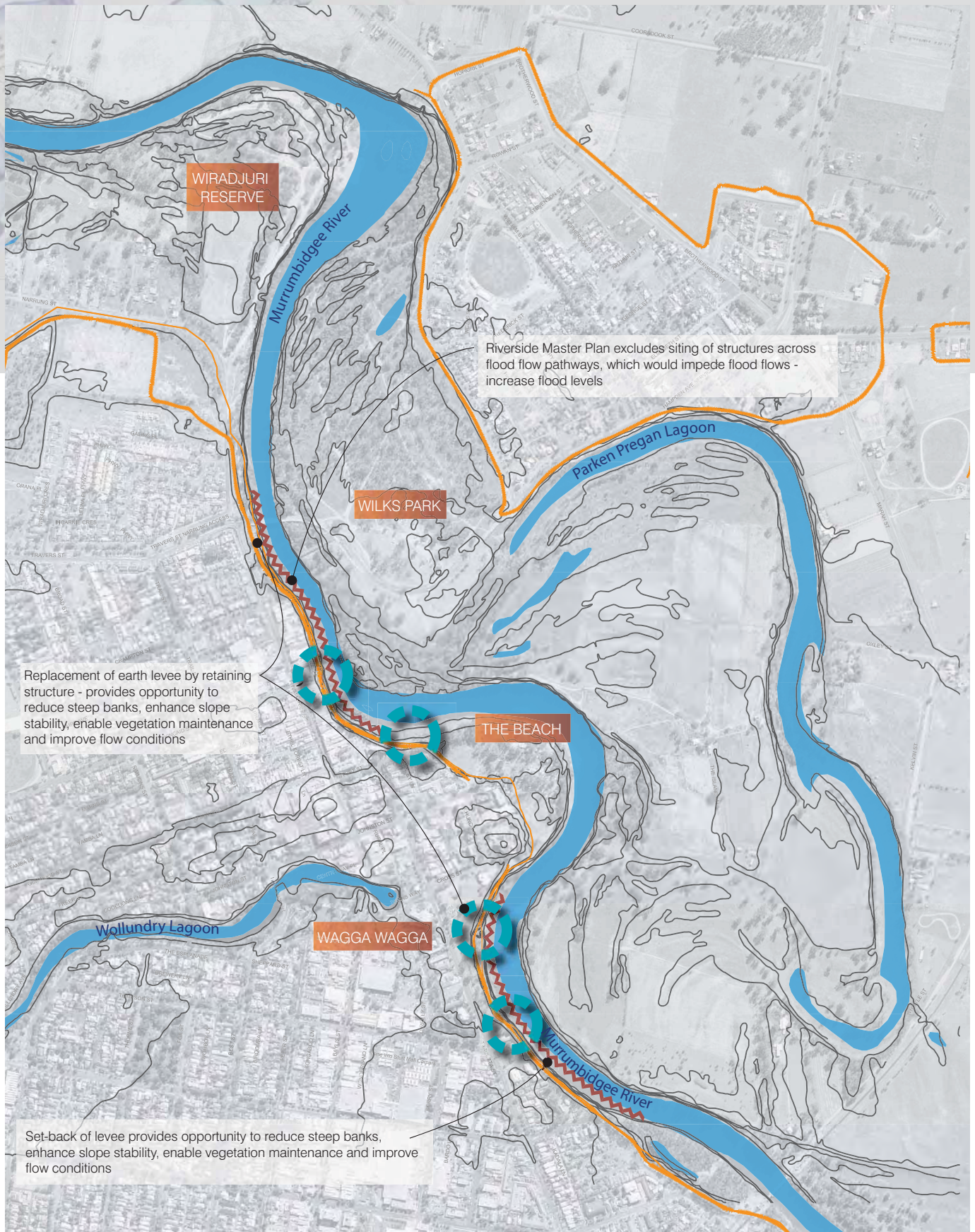
Strategy	Action
Improve links to the wider region	Link the proposed Riverina Highlands Trail to the Riverside via the northern rail line
	Improve the existing Wiradjuri Walking Track to minimise the number of surface materials used and to make it legible along its length
	Prepare an area wide parking strategy that takes account of parking demand at key trip generators and future changes in land use to ensure an adequate provision for parking
	Evaluate utilising part of the existing northern railway alignment to extend the cycleway from the Sturt Highway to Riverside.
Improve links, access and permeability to the riverside from the city and other adjacent places	Improve pedestrian connectivity across streets adjacent the river Note: This could include a review of roundabouts on Fitzmaurice Street
	Ensure a safe and comfortable crossing between Wilks Park and Hampden Bridge at Hampden Avenue
	Introduce pedestrian access to the top of the levee in high visibility locations such as at the end of the streets which intersect with it.
	Redefine the interfaces between Crampton and Kincaid St and the levee as plaza type spaces with raised thresholds and lowered speed limits
	Open the levee bank at key points to give views of the river and / or access to the riverside (see page 88 to 91)
	Reduce through traffic on Tarcutta Street north of Thompson Street
	Introduce traffic calming along Tarcutta Street (north)
Create well used routes and circuits	Create flexible circuits of various lengths for walkers, cyclists and horse riders of all abilities that link attractions in the city and on the riverside
	Create new and improve existing bridge crossings of the river to enable different lengths of circuits to be completed.
	Create new paths along the eastern side of the river that in conjunction with new and improved crossings will create loops of various lengths
	Enable continuous access along the levee for its entire length



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Improve connectivity across the river	Ensure Hampden Bridge becomes a main pedestrian and cyclist access across the river
	Create new and improved bridges / crossings
Encourage active modes such as walking and cycling	Improve pedestrian connectivity to and through the church precinct to the riverside
	Designate some areas as car free or for delivery vehicles only – drop off zones / shared zones. Note: An area to be promoted for service vehicles only is Cadell Place
Provide for safe, understandable and comfortable movement for all	Improve the amenity and safety of the open space network. This may include lighting, active frontages, clear direct paths and ensuring high visual permeability throughout.
	Reduce the potential for conflict between pedestrians and cyclists at key locations within the Riverside precinct Note: this will include Cadell Place and may result in asking cyclists to dismount
	Introduce wayfinding signage at key locations to guide people to and along the river and to its attractions
	Use strong landscape indicators to guide people to the river
	Introduce shade trees to improve pedestrian amenity
	Introduce trees into car parks



Murrumbidgee River and existing water systems



Potential levee gates / overtopping control points



Steep banks



Levee



riverside flood protection strategy



RIVERSIDE FLOOD PROTECTION STRATEGY

1. Context

The Main City Flood Levee is the single major obstacle to recovering the city – river connectivity, values and amenity. The challenge for the Riverside Master Plan is how to modify the Levee in a way that achieves the connectivity objectives, without compromising the level of protection of life and property from floods, or the stability and protection of river banks.

This note assesses potential impacts of Riverside proposals on flood protection.

2. Background to Flooding

Much of Wagga Wagga is located on the Murrumbidgee River floodplain, an extraordinarily wide (3 to 4 km) flat plain, bisected by the current river channel and multiple old channels (anabranches or lagoons). The 'leakier' this system (functioning of the current and historic channels and floodplain), the lower the flow depth (flood level) down the floodplain.

The city and North Wagga and their levees constitute major obstacles blocking a significant portion of this flow pathway, exacerbating flood levels. In particular, the section across the Wollundry Bridge, the south eastern arm of the North Wagga levee, the Mill St levee, and the Hillary St hill and ridge, constitutes the most severe choke to flood flows, creating a flood backwater effect all the way back to the Eunony Rd Bridge.

Downstream of the Hampden Rd Bridge, the flood levels fall relatively steeply (3 times steeper than the Eunony Rd Bridge to Hampden Bridge reach). This explains the quite different geomorphological characteristics between these two zones, with the Eunony Rd Bridge to Hampden Rd Bridge reach comprising a river & meandering anabranch floodplain riverine system, and the Hampden Bridge to Flowerdale St comprising a braided river floodplain riverine system. (Refer to 'Background Note: Geomorphological and ecological assessment of the study area').

The Murrumbidgee River – Wagga Wagga Flood Study 2004, indicated that the 1974 flood (peak discharge 5300 m³/s), previously considered to be an Average Recurrence Interval (ARI) of 90 yrs, was a 60 yrs ARI event. The 100 ARI flood peak flow was re-assessed as 6900 m³/s.

A quasi two-dimensional Hydraulic Model (RUBICON) was calibrated, applying gauged heights and flows from previous flood events. The Model was then applied to a series of selected Recurrence Intervals, to calculate flood levels down the river adjacent to Wagga Wagga.

Figure 37 of the Flood Study Report provides a comparison between the surveyed profile of the current River Flood Levee and the revised 100 ARI flood levels. It identified a number of overtopping locations for the 100 ARI event, including locations upstream & downstream of the Hampden Bridge, and sections adjacent to Narrung St.

The confidence limits placed on flood height estimates are reported as ± 0.5 m. Hence, the revised Flood Levee height requirements are the 100 ARI flood level estimates, plus 0.5 m freeboard. The 100 yr ARI plus freeboard level is superimposed on Figure 37.

The revised Flood Levee height requirement line is above the existing Levee level for some 5.5 km length of the Levee, necessitating a varying increase in the height of the Levee of 0.2 – 0.8 m over this length. In addition, it is proposed to increase the height of the North Wagga flood levee by 0.4 m.

While the 2004 Flood Study applied Best Practice in estimating the 100 yr ARI peak flow, the Study did not incorporate consideration of the impact of Climate Change on flood estimates. Recent estimates of Climate Change impacts on extreme rainfall and flood events have drawn on analysis of extreme rainfall increases over the period 1990 to 2003, and application of more sophisticated modeling of Climate Change effects.

Table 1. Summary of predicted increases in extreme rainfall and/or flood frequencies

SOURCE	CATCHMENT	INCR. IN EXTREME RAINFALL		CHANGE IN CURRENT 100 YR ARI FLOOD FREQUENCY	
		2030	2070	2030	2070
CSIRO 2006	Murrumbidgee NSW	+7%	+5%	70 yr ARI*	80 yr ARI*
Preston 2006	NSW	+15%	+25%		
BOM 2009	State by State NSW	+5% PMP#	+15% PMP#		

Notes: * Calculated on basis of additional discharge to Wagga 100 yr ARI hydrograph
Probable Maximum Precipitation value increase

There appears wide agreement that Climate Change will cause greater variability in storm intensities, and an increase in peak flows for any given return frequency, than estimates based on past rainfall and flood flow records.

The Riverside proposals having a potential to impact (positively or negatively) on flood protection, comprise:

- proposed changes to the location and alignment of the levee and slope of bank;
- proposed changes to vegetation – landscaping;
- proposed construction of a terrace on the city side of the 'Bend'; and
- proposed incorporation of openings (gates) into the earth levee.



3. Proposed changes to the location and alignment of the levee and slope of bank

All of the proposed changes to the levee location involve step-backs from the river, thereby enhancing flood flow capacity. Alignments have incorporated radial constraints, to minimize an potential for local turbulence – energy losses.

All of the proposed changes to the slope of the river bank, involve a reduction in slope, thereby enhancing flow capacity.

It is concluded that proposed changes to the location and alignment of the levee and slope of the river bank, will enhance flood protection levels.

4. Proposed changes to vegetation – landscaping

River bank and floodplain vegetation serves to armour surfaces against erosion during flood flows, by binding of soils by vegetation root systems, and by decreasing velocities adjacent to earth surfaces. Conversely, vegetation increases the hydraulic friction at the earth surface, thereby impeding flow velocities – increasing flood levels. The question in respect to potential impact on flood protection, is to what extent do the proposed changes in vegetation have the potential to increase hydraulic friction, leading to increased flood levels?

Restoration of riparian vegetation is proposed in respect to Wilks Park and Wiradjuri channels, to protect these areas against erosion, and to restore their landscape and habitat values. The scale of the re-vegetation is minor in respect to planting density and area, with removal of some trees, and replacement with trees shrubs and grasses endemic to the area. The changes will be neutral in respect to impacts on hydraulic friction levels. As noted in Section 1 above, the flood level gradient for the Hampden Bridge to Flowerdale River reach, is some 3 times steeper than for the Hampden Bridge to Eunony Rd Bridge reach of the river. viz: the Hampden Bridge to Flowerdale River reach is less critical in respect to flood levels, than the Hampden Bridge to Eunony Rd Bridge reach.

Some re-planting / landscaping is also proposed for the city side river banks. As this will involve thinning of overgrown areas, and replacement of some trees with shrubs and grasses, the net effect will be an enhancement of flood flow capacity.

It is concluded that the proposed changes to vegetation – landscaping will have zero impact on flood protection levels.

5. Proposed construction of a terrace on the city side of the 'Bend'

Raising of earth levels within the floodplain, results in some reduction in available flow cross sectional area, and therefore the potential to increase flood levels.

It is proposed to create a low and narrow terrace, north of the Church Hill, curving back to Church St. Hydraulic calculations indicate low to zero velocities across this section of the flood channel, as a result of the inside bend location of the terrace, and the effect of Church Hill creating something of a back-eddy in this location. The proposed removal of structure associated with the caravan park will enhance flow capacity across the Bend.

It is expected that the net effect of these changes on flood protection levels will be neutral.

6. Proposed incorporation of openings (gates) into the earth levee

The draft Riverside Master Plans proposes the incorporation of gate openings in the levee at a number of locations, to provide visual and movement connectivity between the city and the river. In the event of a flood warning, using panels located on site, these openings can be quickly and reliably closed, to maintain the effectiveness of the levee in protecting the city from flooding.

The indicative arrangement comprises a concrete slab floor and wing walls to establish the opening in the earth levee, a central (folding) buttress, and 4 (1.4 m x 3.0 m) panels, stored locally and manually installed in the event of a flood warning. (Refer to Figure 1). A simple 'manual placement of panels' arrangement has been recommended in preference to automatic systems, in the interest of reliability and robustness, where installation of panels may only be a 1 in 20 yr event. The provision of a panel storage pod next to the gates, avoids the need to transport the panels in the event of a flood warning – panel installation event.

It is concluded that the Riverside 'openings in the levee' will not compromise the efficacy of the levee in protecting life and property from flooding.

As a result of the public submissions recieved during the exhibition phase of the Draft Strategic Master Plan in regards to levee and flooding issues the plan was amended to emphasise that:

- any proposals relating to the levee and / or development on the flood plain must be approved by all relevant authorities;
- any proposals for creating openings in the levee must include comprehensive engineering and management plans; and
- the communication element of the plan is reinforced at the time of development.

7. Risk of breaching of the levee for floods greater than the 100 yr ARI design flood

The analysis of potential impacts of Riverside on flood protection identified a concern, which, while not affected by the Riverside proposals, needs to be drawn to the attention of Council. This Section addresses that concern.

The NSW Emergency Services recently commissioned an Audit of 59 levees across NSW (Barbour, Babister & Gissing 2009). The Report noted that all levees will be periodically overtopped, necessitating the analysis of locations where overtopping will occur, the sequence of overtopping and flooding. The Report concludes that levee overtopping can be compared to dam failure, with impacts which are equal to or greater than the failure of some dams. The 2004 Flood Study and 2007 Floodplain Risk Management Plan undertaken by Council addressed these requirements.

From a dam safety perspective, the failure of earth dams is either by structural failure, or breaching of the wall by flows overtopping the wall. Water flowing over an earth embankment, will quickly erode the embankment fill, resulting in a breach in the dam wall. In the case of a breach in a levee, the surge of flood



water through this opening will have enormous destructive capacity. Because the point of levee breaching cannot be pre-determined, all areas adjacent to the levee are at risk. This is particularly acute in the case of Wagga, where the levee is literally on the back boundary of many commercial and residential properties.

While raising of the levees will reduce the frequency of overtopping, ultimately it will be overtopped. Paradoxically, the higher the levee the greater the risk of catastrophic structural damage and potential loss of life from uncontrolled levee breaching at the point of flood levels overtopping the Levee. The destructive power of a surge of water through a breach in the levee is proportional to the square of the height.

Spillways are incorporated into dams to minimize the risk of embankment overtopping. In the case of long levees, the additional height required to drive the large spillway discharge rates associated with flood flows, would be excessive. There are two simple means of resolving this constraint.

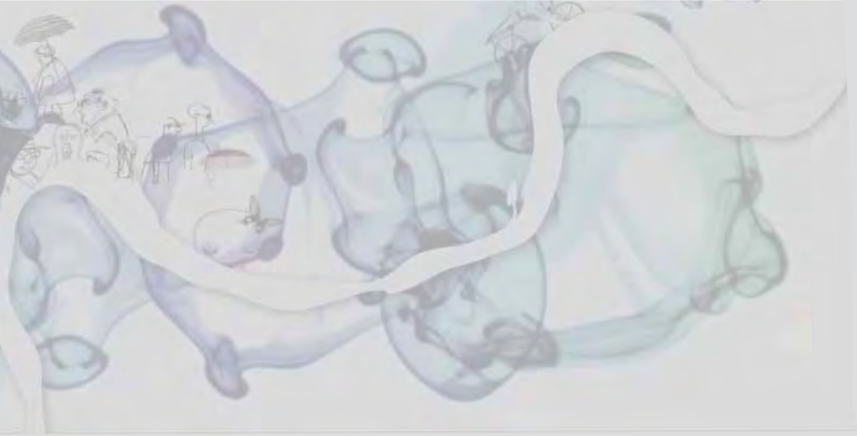
Firstly, the incorporation of 'fuse plugs' of material into the levee at selected inundation pathways, designed to overtop before the earth levee. The 'fuse plug' material is designed to quickly erode, allowing relief of flood heights behind the levee (protection of the earth levee from overtopping), and a controlled surge of floodwater to enter the city at selected safe locations.

The other option is the use of gates, which can be opened just prior to overtopping, enabling use of the full height of the levee. The gates provide certainty regarding the point of city inundation, and the timing and the locations at which this will occur, so that the SES evacuation initiation, and location of evacuation routes, can be managed with greater certainty.

The draft Riverside Master Plans includes the use of gate openings in the levee at a number of locations, to provide visual and movement connectivity between the city and the river. If Council decides to do this, the potential exists for the gate openings to be readily adapted at some time in the future, to provide the flood overtopping and inundation management control system. This would require the replacement of the riverside 'static' panel gate system with mechanical gates that can be raised during a flood event.

It is concluded that the Riverside 'openings in the levee' provide Council with a means of preventing overtopping and associated risk of breaching of the levee, in a situation of a flood event greater than the 100 yr ARI design flood.

For further information on flood protection measures refer to Appendix D.



Construction of levee behind Fitzmaurice Street c 1960



STRATEGIC MASTER PLAN

Following the development of the Strategic Framework, preliminary concept designs were developed based on the outcomes of the site analysis and Strategic Framework. These were discussed in internal workshops and presentations before being presented to the public for a 'brain storming' session at the Community Picnic Day.

The preliminary concept designs are included in Appendix A of this report.

RIVERSIDE COMMUNITY BRAINSTORM

A Riverside Community Brainstorm was held on August 15, 2009 to discuss and share ideas for Riverside with the community. Key outcomes from the consultation include:

- strong support for a major community facility;
- concern regarding sufficient parking at the major community facility;
- strong support for a pedestrian oriented plaza across Tarcutta Street;
- concerns regarding traffic calming along Tarcutta Street;
- support for a pedestrian plaza at Church Hill;
- concerns about development sites in front of the Watermark Complex;
- general support for the relocation of the caravan park;
- suggestions for an alternative river crossing near Sturt Street;
- concerns about lack of parking facilities and their proximity to the beach;
- concerns regarding the major development site at the beach;
- support for the levee treatment north of Sturt Street;
- concerns regarding maintenance of Hampden Bridge;
- support for the retention of Hampden Bridge;
- general support for a development site at Hampden Bridge;
- general support for the proposed treatments of Wilks Park;
- general support for the proposed treatments at Wiradjuri Reserve; and
- suggestions for the provision of wheelchair access to the river.

The suggestions and concerns from the community have been carefully considered in the development of the Master Plan and numerous issues have been addressed. Key outcomes include:

- parking strategies have been incorporated in the Master Plan;
- traffic calming along Tarcutta Street requires further investigation;
- development sites in front of the Watermark complex have been excluded;
- an alternative future river crossing has been identified and incorporated within the Strategic Master Plan; and
- strategies to assist in the maintenance of the bridge have been included in the Strategic Master Plan



Above newspaper clipping from: The Daily Advertiser - Monday 17 August, 2009



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riverside wagga wagga

strategic masterplan



DESIGN ELEMENTS & OBJECTIVES

The Strategic Master Plan has been developed based on the site analysis principles and objectives and the Strategic Framework. The plan also incorporates ideas and suggestions from the Riverside Community Brainstorm and responds to community concerns and ideas where practicable.

The plan encompasses the whole Riverside site area and identifies existing key elements, land uses and activities, new movement and transport linkages, environmental initiatives such as ecological corridor development along the river, landscape remediation in the large parks, water sensitive design elements and street / park enhancements including recreational/facility improvements.

EXISTING ELEMENTS

These are existing elements that directly interface with Riverside and include the existing levee, roads, on-road cycle facilities, off-road cycle facilities, walking tracks and beaches.

LAND USE & ACTIVITY

These elements include proposed areas for new development, identification of activity generator locations, existing facilities to be upgraded such as public amenities, areas proposed for an increase in the current floor space ratios, locations of multi-level car park facilities and playgrounds, and future relocation of the caravan park and the Playhouse Theatre.

MOVEMENT & TRANSPORT

These elements identify proposed changes to movement and transport and include extent of street calming, proposed new roads / parking, proposed new cycle, pedestrian and shared paths, location of proposed pedestrian oriented street enhancements, plaza type spaces and new walking tracks.

ENVIRONMENT

Improvements to the natural and cultural environment are demonstrated through the sensitive planning of built form/landscape; innovative landscape / water proposals including plantings to reinforce indigenous associations, improvements to river bank stabilisation / enhancement; processes to involve collaboration with Aboriginal groups, water sensitive design proposals, recreational facilities planning, retention of critical views, and planning improvements to the passive / environmental recreational facilities of the city.

WATER SENSITIVE DESIGN ELEMENTS

Water sensitive design enhancements and improvements assist in re-interpreting previous waterways and therefore strengthening the landscape legibility of the city, as well as incorporating stormwater treatment / cleaning functions such as wetland filters, bio-retention swales, swales in lieu of pipes underground, a perched wetland to provide cleaning of stormwater, and extensions to existing waterways (e.g. long term vision for Wollundry Lagoon at Tony Ireland Park) to add value to the urban / environmental setting of the city. All of these proposals would be suitable for grant applications from the Federal and State Governments to assist with the implementation costs.

The Riverside Master Plan Project, arises from a Wagga Council, Land and Property Management Authority and community recognition that the river and riverine zone adjacent to the city is an extraordinary asset, currently largely ignored by the city.

Key objectives of the Master Plan comprise:

- enhancing the city's open space, landscape and recreation values through re-connection with river;
- building a more sustainable future through recovering important natural city – river linkages and environmental values; and

- enhancing cultural, academic, heritage and aesthetic engagement afforded by re-connection of the city with the river. The Strategic Master Plan translates the strategies and actions identified in the Strategic Framework.

These objectives have been reflected into actions in the Strategic Framework and translated into the Strategic Master Plan.

RIVERSIDE REGENERATION

The actions set out under Riverside Regeneration have been adopted by the Strategic Master Plan. For key areas such as Regenerated Residential, New Residential, Arts and Energy planning mechanisms have been adopted to promote such activities. Under Riverside Nodes, Demonstration Farms and Community Gardens would require further consultation with Authorities and Community Groups to determine their viability.

LANDSCAPE MANAGEMENT ZONES

The Strategic Master Plan fully translates the guidelines set out under Landscape Management Zones. It is considered critical to follow the Strategic Framework in this regard to both minimise maintenance, protect the environment and mitigate damage due to flooding.

LAND USE OPPORTUNITIES

A number of land use opportunities will depend on private entrepreneurship however, built form guidelines for the development of key areas and sites have been integrated into the LEP to promote such type of developments and allow the principles set out in the Strategic Framework to become a reality.

BUILT FORM OPPORTUNITIES

All the principles and actions identified in the Strategic Framework have been adopted. It is considered vital that these measures are pursued as they form a critical component to the overall vision and vitality of the Master Plan.

MOVEMENT AND ACCESS OPPORTUNITIES

Most of the principles and actions identified in the Strategic Framework have been adopted. Some elements fall beyond the scope and area of the Riverside Master Plan, yet have been identified as part of an overall structural framework such as linking the Riverina Highlands Trail, potential improvements to Wiradjuri trail, and extension of the cycleway from the Sturt Highway. Other measures such as the elimination of the existing roundabouts along Fitzmaurice Street would require further traffic investigations before being adopted.

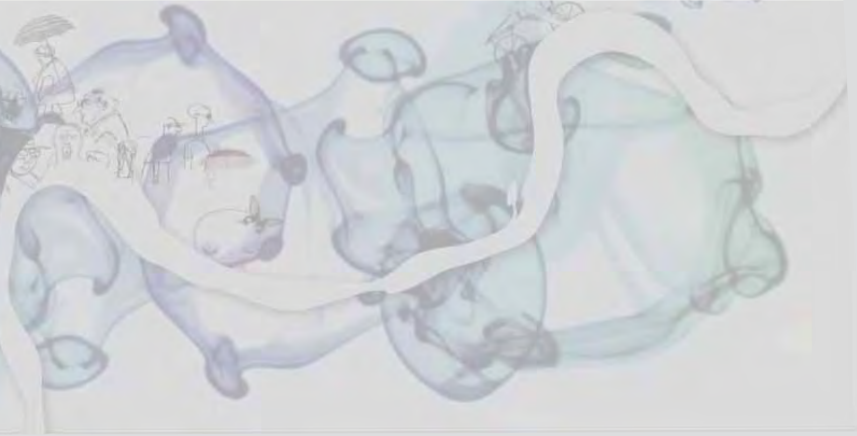
The Strategic Master Plan also incorporates a series of design themes that underpinned the Strategic Framework and compliment the resolution of the design. These design themes are:

GREEN FINGERS to reinforce the riverside presence into the urban zones and compliment the environmental objectives;

INTEGRATED LEVEE which focuses on reshaping the levee to visually blend it with the natural and built setting;

RE-INTERPRETING WATERWAYS to visually reinforce natural ecological patterns as part of the unique riverine setting; and

PEARLS ON A STRING which focuses on connectivity, diversity and usage to create a continuous network of places and spaces based on the **MOVEMENT AND ACCESS STRATEGY** and **LAND USE/BUILT FORM STRATEGY**.



DESIGN THEMES

Green Fingers

The Analysis of the precincts noted the need to improve the visual and physical connections between the city and the river.

Whilst key to achieving this is to open vistas and plan built form accordingly as well as introducing creative landform changes to the levee where applicable, there is opportunity to create legible green links that assist in improving legibility of the setting. These green links also would provide legible “signage cues” to get to the river from the city.

The historic plans of the city tell the story of building a barrier between the river and the city, and now the levee bank obscures the vistas to the river and prevents visual linkages.

A Green Fingers design theme proposal is to create strong plantings of River Red Gums and White Gums from the river bank up into the city, to provide clear visual “gateways” and cues to and within Riverside. Key areas to strengthen are:

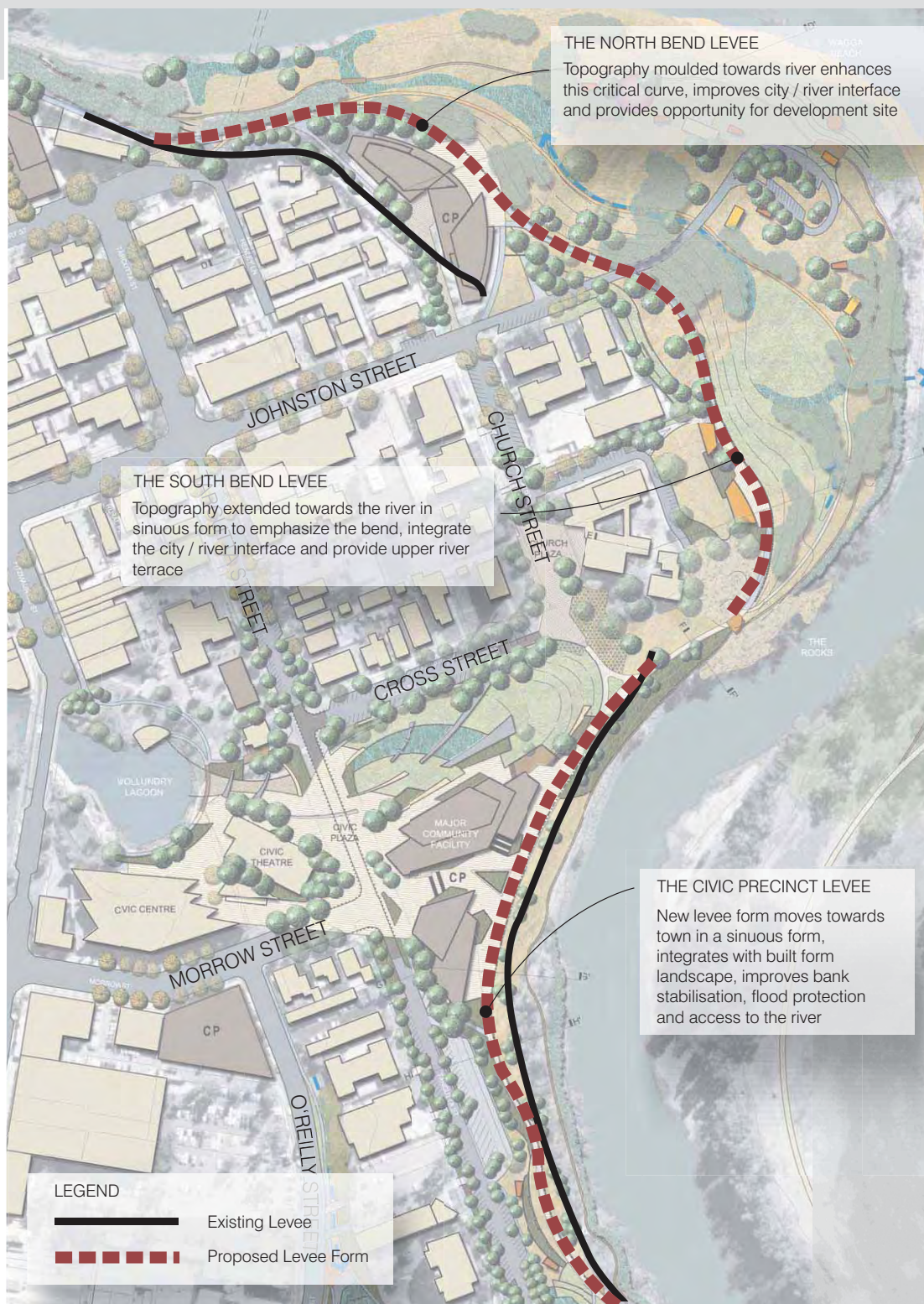
- the entry to Riverside at Travers Street and north Fitzmaurice Street and to the south where Tarcutta Street / Thompson Street create the southern “entry” into Riverside;
- key places and spaces where possible that also act as key pedestrian links to the river, and to strengthen the visual cues between Fitzmaurice Street, such as between Crampton and Kincaid Streets, Sturt Street;
- southern Church Street, Tarcutta Street as the main central spine linking the river / city;
- between the Wollundry Lagoon and the river, including the alignment of the previous southern end of the lagoon, into Tony Ireland Park, and across to the river; and
- this green fingers concept would require under grounding of power along Tarcutta Street as a high priority, in the central community precinct area.



The lack of riverine vegetation does not provide any clues that the river is directly adjacent to this setting.



Introducing River Red Gum vegetation as part of the streetscape strategies at key locations would reinforce the visual connectivity between the riverside and the city.



Above: Proposed levee modifications



Integrated Levee

The main levee bank, constructed between 1960-62, has formed a delineating barrier between the city and the river.

The need to improve visual and physical connectivity between the city and the river is a first priority for Riverside, without jeopardising flooding for the city.

With these objectives in mind, a creative solution to better integrate the levee with the topography and the new urban built form of riverside elements has been proposed. The form of the proposal reflects the sinuous nature of the Murrumbidgee River as it is through Wagga Wagga. The advantages and key issues are described below:

THE NORTH BEND LEVEE FORM

Sandwiched between the Retirement Village and the existing carpark, the current levee forms an abrupt, disconnected edge to the city interface. The proposal brings the landform towards the river, to form a more cohesive, natural shape that complies with flooding constraints.

The levee shape also provides opportunity for new development that is an essential component of making Riverside a reality, and creates a generous upper level public river terrace that overlooks the rejuvenated park space below, and provides sufficient space for an effective planted buffer against the retirement village. This planting will form a necessary strong, green defining edge to the riverside from the Beach area.

Below: view from the existing carpark at Wagga Beach illustrating the disconnecting effect of the levee with the existing roofs of the village beyond.



THE SOUTH BEND LEVEE FORM

This section of levee is contained on the south by the existing granite landform, and to the north in front of Watermark, it is to the top of the existing retaining wall. The levee realignment proposal better integrates these two elements and creates a more natural, sinuous shape that relates to the nature of the river, and also provides opportunity for an upper plaza with some developable areas that would generate activity and increase use in this area.

Below: the existing rocky knoll below the Church remains untouched to the south. Watermark development (right) is to be integrated with new levee form.



CIVIC PRECINCT LEVEE FORM

The levee through this area forms a distinctive visual blockage to the river corridor. It follows a constant curve and the slopes between the levee and the river are very steep. These slopes in the long term should be gentler to enable adequate management and to avoid undercutting from erosion. The proposal moves the levee back towards the city in a more sinuous alignment that assists flood mitigation, creates gentler accessible slopes to the river edge, and allows more direct access to the river corridor.

Views to the river from the city and along the edge of the river corridor are also enhanced and opened up. In the central area the levee becomes part of the built form, thereby reducing visual delineation of the linear barrier it currently creates.



Above: view looking north from the south of the site towards the tourism office; the levee visually and physically separates the street / city from the river.



Above: Waterway re-interpretation elements



Re-interpreting Waterways

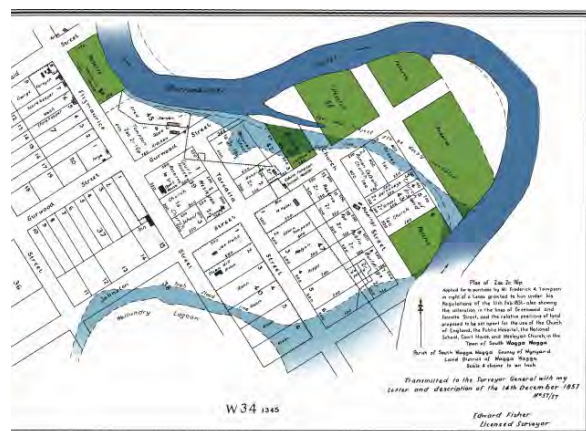
At the macro scale, the number of remnant lagoons across the city area range well beyond the scope of the Riverside Master Plan. We understand that Council is already investigating sustainable lagoon strategies for the city. The potential for the lagoons as valuable environmental, economic and social assets, and as key landforms determining responses to Climate Change into the future was highlighted earlier in this report.

Water as an element needs to be valued not just for its hydraulic function, but valued also for its visual, aesthetic, educational and health benefits it can contribute to society.

The lagoons, the river and the enhanced water stories / water lines embedded in the city's history as well as environmental initiatives with water would add value to Wagga Wagga's sustainability, image, development, cultural, tourist, and research credentials of the city and have the potential to present an amazing showcase for national and international interest.

The maps on these pages indicate the application of this strategy to the central "Bend" precinct, where wetland areas and surface swales are proposed in areas that either reflect past alignments of river flow patterns, original lagoon alignments, or create new visual improvements to link the existing lagoon to the river. They will contribute to the environmental and social fabric of the city by:

- responsibly cleaning stormwater prior to releasing it into the river system;
- increasing stormwater for the Wollundry Lagoon;
- slowing down stormwater velocities and thereby reducing flooding;
- providing a sealed layer above contaminated fill site (gasworks) to improve stormwater quality prior to entry into the Wollundry Lagoon;
- providing cleaning opportunity for harvested stormwater from roofs of the future community facility; and
- providing opportunity for water monitoring/water conservation, environmental interpretation and education for the city residents.





Above: Activity generators in conjunction with non-vehicular circulation



Pearls on a String

A strong visual and functional structure is required in order to create a legible open space framework that incorporates existing elements, whilst also enriching the urban fabric and public realm.

This is achieved by the development of an array of networks and activity nodes to create continuity and connectiveness both visually and functionally. These pedestrian and cycle networks aim at minimising traffic and usage conflicts and provide a variety of riverside experiences.

The networks distinguish between areas of stillness and movement, for example the riverside trail emphasises the environment whilst shared paths express movement and sport. Pedestrian promenades and the levee walk focus on pedestrian activities with an extroverted nature.

These networks interface existing networks and exploit existing elements to enrich the overall experience and livability of Wagga Wagga for its citizens and visitors alike.

A series of activity nodes has been integrated along the main levee walk, at the beach and Hampden Bridge with the intent of creating points of interest that also help define the overall riverside journey. The nodes correlate with public pedestrian oriented spaces/plazas and are considered key elements in celebrating the river.

Levee Openings

A series of levee openings are proposed between Hampden Bridge and the Beach to enhance visual and urban permeability. The openings are proposed at key locations where vistas along the existing city structure are reinforced towards the river such as at Kincaid Street and at Sturt Street.

Connectivity is improved through the proposed major public car park facility at Johnston and Church Street, servicing the beach and associated parkland.

In conjunction with the levee openings, levee infill panels are proposed in those areas where the levee is required to be raised from its existing levels, such as between Sturt Street and Crompton Street. The infill panels would be approximately 700 to 800mm high and would greatly contribute to visual permeability towards the river.

For further information regarding the levee openings refer to Riverside Flood Protection within this section of the report.

Finally, it is acknowledged that any levee openings pose a risk towards the community and it would be essential to instigate appropriate management systems as well as seek consultation and approval from DEC. It is for this reason that the number of proposed openings have been limited to strategic locations.



PRINCIPLES & GUIDELINES

Activity Generators

It is important that the Plan introduces the 'Pearls on a String' theme to create points of interest along the whole stretch of Riverside. These points of interest are also visual markers and activity nodes that enhance the safety and livability of Riverside.

These nodes should be interspersed at approximately 300 metres to create visual connectivity. Uses such as: kiosks, cafes, restaurants and retail facilities should be integrated at these locations.

Pedestrian Oriented Streetscapes and Plaza Type Spaces

The plan identifies a number of pedestrian oriented plaza type spaces and are considered critical in the enhancement and urban quality of Wagga Wagga. The function of the spaces depend on their location. For example at Tarcutta Street the emphasis is on urban connectivity to the riverside, providing a strong visual marker to the arrival sequence into the city / major community facility, to extend the definition and setting of the Civic Precinct, to allow improved amenities and flexibility for festivals and market functions, to reduce the visual dominance of roads in the public realm, to beautify the streetscape and to enhance safety.

In other areas such as along the upper levee walk in the vicinity of Church Hill, the plazas or viewing decks act as markers along the way to add interest and improve the spatial legibility of the area.

The pedestrian plaza at Church Hill allows for larger congregations to gather in front of the church whilst visually consolidating the setting with the two churches into a single ensemble.

At other areas such as Sturt Street, Kincaid Street and Hampden Bridge, the plazas celebrate the riverside by improving linkages to the river through levee gates, promoting the interaction between the urbanscapes and the natural environment.

The pavement for the plazas should be contemporary and consistent to visually link these spaces and reinforce the overall ensemble. The use of asphalt should be avoided and the use of bricks should be limited.

Two types of pavement with a strong colour contrast are recommended in those areas where road thresholds are introduced such as in Tarcutta Street, Cross Street, Church Street, Kincaid Street and Cadell Place. These will assist in road legibility whilst also providing a transition zone with the pedestrian plaza. The two contrasting pavers could be combined in their treatment to give each plaza its own character.

It is important to introduce contemporary paving within these plazas to create a strong and legible network. The use of recycled and permeable materials is encouraged.

Built Form

The built form should respect and flawlessly integrate with the existing urban fabric. The plan identifies a number of special or isolated development areas each responding to its surroundings.

The plan also proposes changes to the current floor space ratios in key areas as part of a framework to promote the urban rejuvenation. The parameters proposed are based on city planning principles that directly respond to the urban rejuvenation of Cadell Place and are discussed in more detail in the Hampden Terraces Precinct Master Plan.

Environmentally Sustainable Design (ESD)

WATER

- preserve site watersheds;
- apply water sensitive design initiatives wherever practical;
- creatively recycle, treat and express recycled rainwater in public spaces;
- introduce swales to trap particulate pollutants;
- introduce wetlands to filter and clean stormwater prior to releasing to the river;
- introduce accessible areas to clean out pollutants and silt from ponds, lagoons;
- promote stormwater recycling;
- promote water conservation;
- employ water efficient landscape design- with mulches, correct subgrade preparation and use of endemic / native species with low water demands;
- minimise the use of turf areas;
- maximise the use of permeable paving and permeable surfaces; and
- consider innovative wastewater technologies.

HEALTH

- promote urban connectivity for pedestrians and cyclists; provide opportunities for an active lifestyle;
- create user friendly paths and settings that promote alternative uses of transport. Create park spaces that provide variety, are adaptable over time and that provide for a range of social interaction for activities;
- create trails and loops that encourage walking, jogging and other forms of exercise;
- introduce bike hire stations;
- enhance the provision of public transport (frequency of service, route alignment and bus stop locations);
- promote the use of public transport; and
- encourage cycling through the provision of convenient and secure bicycle parking for residents and visitors.



ENERGY

- introduce energy efficient lighting systems;
- provide convenient and secure bicycle parking for residents and visitors;
- utilise existing roof space owned by Council to incorporate solar energy initiatives within Riverside;
- investigate financial models for private investments to lease Council roof space for solar energy harvesting within Riverside;
- explore the usage of alternative energy sources such as solar, wind and heat pumps; and
- investigate grey water recycling systems.

BUILT FORM

- promote active frontages at street / park level;
- respond to building orientation in the façade treatment;
- explore the usage of alternative energy sources such as solar, wind etc;
- incorporate passive energy measures including shade structures, fenestration, eaves, awnings etc;
- maximise natural light;
- promote energy efficient practices (heating systems, lighting, ventilation, insulation etc);
- ensure that all new community facilities within Riverside will reach a minimum 5-Star Green Rating;
- ensure building materials used are made with renewable resources (specifically local materials);
- ensure building materials used require least energy to process, manufacture and transport;
- ensure building materials used require less energy to maintain, are durable and can be recycled;
- ensure high indoor environmental quality by using low emission Volatile Organic Compounds (VOC) paints, carpets, laminates, adhesives and varnishes;
- use light coloured materials in interior spaces;
- encourage modularisation of construction by selecting materials for use as standard sizes to improve efficiency;
- provide dedicated waste storage and separation facilities;
- adopt planting / landscape strategies suitable for the climate; shade façades in summer and permit passive solar heating in winter; and
- create housing that is socially sustainable – avoid more than 2 to 3 flats per floor per stairway.

ENVIRONMENT

- use endemic and native plant species to strengthen biodiversity;
- protect existing environmental features and ecosystems;
- enhance existing resources in a creative, sustainable way, e.g. park and street tree planting;
- regenerate lost or damaged ecosystems;
- utilise landscape plantings to improve microclimates, e.g. wind protection and solar access;
- design for bush fire risk;
- implement initiatives to promote native bird populations;
- promote eco-tourism;
- improve river bank stability through integrated engineering and landscape;
- re-habilitate contaminated land;
- protect site soils and improve health of degraded soils;
- recycle mulches, rocks and other materials from sites;
- balance earthworks, and minimise waste from construction;
- support concepts for community gardens, food production;
- consider life cycle and maintenance costs of new works; and
- reduce use of fossil fuels.

FINANCIAL

- develop financial feasibility models for the various components of the Master Plan to ensure their viability;
- investigate funding from various government grants/subsidies for the instigation of sub-components; and
- amalgamate funding initiatives to identify phasing and scope of work delivery.

DESIGN PROCESS

- employ innovative, adaptable and responsive design processes that continuously re-evaluate assumptions and values and adjust to demographic and environmental change.



LEGEND

EXISTING ELEMENTS

- Levee
- Road names
- Built form
- Roads

LAND USE & ACTIVITY

- Existing facility upgraded
- Cafe / activity generator
- Playground
- Picnic spot
- Picnic shelters
- Viewing decks
- Exercise station

MOVEMENT & TRANSPORT

- Road & car parking
- Cycle path
- Pedestrian path
- Walking track
- Shared path

ENVIRONMENT

- Higher Murrumbidgee River Floodplain species
- Lower Murrumbidgee River Floodplain species
- Wetland / channel restoration
- Native / dry grass
- Irrigated / mown grass
- Streetscape enhancement

WATER SENSITIVE DESIGN

- Wetland filters / aeration

KEY ELEMENTS

1. Boat ramp
2. Adventure playground
3. Viewing platforms
4. Picnic facilities upgrade
5. Sports field / event parking overflow
6. Caravan park - layout indicative
7. Caravan park office facilities
8. Entry signage
9. Short term: sports field / BMX track; long term: mixed use
10. Landscaped blisters to incorporate parallel parking
11. Viewing deck / interpretation
12. Canoe / kayak launching facility
13. Unseated access drive to launching facility
14. Bird hides / interpretation facilities
15. Self-contained traveller overflow facility / expansion
16. Self-contained traveller facility
17. Bike hire
18. Urban park with playground, barbecues and improved facilities
19. Cafe / restaurant
20. Potential dog agility park or suitable development (caravan park or camping) subject to detailed analysis
21. Potential future car park - in conjunction with river crossing; or extension area for suitable development
22. Potential river crossing



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wiradjuri / wilks reserves precinct masterplan



PRECINCT MASTER PLANS

WIRADJURI RESERVE / WILKS PARK

Both reserves are within the sensitive floodplain environment as explained in the analysis section of the report. Hence proposals are compatible with the environmental constraints and also respond to the strategic vision to improve connectivity between the river, the city and North Wagga Wagga.

These areas are mostly suited to passive recreation and no large built facilities are proposed, other than improvements to existing public facilities.

The park Master Plans improve connectivity/walkability, strengthen environmental conservation values, improve biodiversity, and provide improved recreational facilities for both Wagga Wagga and North Wagga Wagga residents, as well as demonstrating the unique riverside setting for use to the region and interstate travellers (Self-contained travellers / caravan park).

A summary of key design proposals are described below. The legend indicates four types of riverside open space through these areas:

Urban Park / Managed Facility

In the areas of higher ground. These are areas with moderate visual exposure that also provide buffers to the river corridor. These are locations where BBQs, picnic areas surrounding existing toilet facilities, low impact picnic shelters and limited, yet controlled car access is proposed. These areas are accessible by bike, and should be designed to cater for bus access for large community events.

In both parks, the existing toilet facilities are proposed for extension and upgrading and additional BBQ facilities and picnic areas are proposed. Due to the remoteness of the sites, it is proposed that alternative power and servicing sources be evaluated at the next stage; options such as solar power, solar lighting, and compost toilets should be evaluated.

Within this zone also there are future adventure play areas nominated. The design of the equipment should complement the natural setting and acknowledge the floodplain setting.



Natural Focus Land Use

These areas are on the middle ground where low use and management was proposed in the analysis stage. These areas are ecological buffers to other sensitive river corridor areas and should have service vehicle only use. They are suited for low recreational use / intermittent use / temporary use such as the self-contained travellers in Wilks Park, or informal picnic areas in Wiradjuri Reserve with interpretation trails. Bush regeneration and revegetation is proposed to these areas.





Environmental Recreation / Protection

These areas cover the sensitive river bank areas and floodplain channels, anabranches and drainage lines. They are areas of high conservation / biodiversity value and cycle and equestrian usage should be restricted from these areas, except to discrete areas for crossings. Environmental interpretation trails, signage and boardwalks are ideally suited to these areas. In Wilks Park, a fitness loop has been proposed through the southern area.

Special Potential

WIRADJURI RESERVE

Wiradjuri Reserve has tremendous potential to incorporate an Aboriginal interpretation trail through working with the Aboriginal Elders. The area has a fascinating natural and cultural history which could be linked physically through the trail network to the integrated Visitors Centre / Museum.

The Strategic Master Plan proposes to relocate the Caravan Park from Wagga Wagga Beach to the visually enclosed area of flat land at Wiradjuri Reserve. The area is ideally suited due to its proximity to the river, city and the attractive landscape setting. It is also adjacent an area currently used for sports. The proposed location is considered the most suitable and attractive as it also provides minimum conflict between desired surrounding community land uses.

WILKS PARK

Wilks Park has a closer connection to the city, especially with the proposal to enhance the route across Hampden Bridge. In addition Wilks Park is bordered by the North Wagga development to the east, thereby providing great future potential to improve links, and usability of the park system to the adjoining residents.

Due to its ideal and central location to services, the self-contained traveller use is proposed for the southern area of Wilks Park, which is an area of higher ground within the floodplain and already a disturbed environment.

In keeping with the strategic nature of the master plan, an area at Wilks Park has been identified for possible suitable development such as camping or a caravan park, subject to detailed analysis. Kiah Infranet's analysis of the geomorphology places the site in the "meandering / anabranch flood plain" zone indicating high intensity flood flows which would most possibly pose risks to both developments themselves and to flood characteristics. It is recommended that a detailed risk analysis be carried out before any developments in this area are further considered.

Proposals for landscape remediation and creation of spaces to create feelings of isolation in a bush setting will further enhance usability of this area of park. Wilks Park is also suited to Aboriginal trail interpretation, especially in relation to the river corridor and the future potential wetland system with bird watching platforms/shelters and boardwalks.

Key to the success of both park systems is control and management of vehicular access and carparking. Proposals include formation of sealed roads over existing roads or compacted areas, and barriers to the roads to limit car access into the parks. Car parking is provided in a linear fashion along the road to allow easy access to adjoining facilities and park spaces.



Above: Example of potential bird watching station

Below: Providing fitness stations that accommodate use for young and old promotes health and wellbeing and serves as an added attraction for users.



Environmental Protection and Enhancement

Much of the park systems are shown as this zone which primarily encompasses landscape protection and remediation to increase biodiversity values and protect elements such as riverine channels, steep river banks etc, and other sensitive lower floodplain landscapes.

Predominantly within the areas of Natural focus open space use, Environmental recreation / protection and Environmental Conservation, planting proposals will reinforce the natural vegetation associations of the area- the Higher and Lower Murrumbidgee River Floodplain vegetation, and the dynamic braided channel plantings.

Both parks display a landscape requiring rejuvenation and conservation, and have the unique river floodplain character of braided channels and anabranches. These natural, dynamic forms in the landscape require sensitive planting rehabilitation with riverine low grasses for them to be read legibly in the landscape. The planting of indigenous species through these channels would also increase the biodiversity of the area and provide educational inspiration.

Recreational Facilities

Fitting to the sensitive environments and flooding constraints of both parks, only passive recreational facilities are provided to these areas to improve existing facilities and complement the movement / trail system through both areas. Key elements proposed include:

- upgrade of both public facilities buildings with extension in the future to cater with demand;
- BBQ areas and new picnic areas to both parks, with picnic shelters for shade;
- comprehensive pedestrian trail networks and bicycle networks;
- equestrian trails to both parks (restricted in sensitive areas);
- adventure play areas to complement the surrounding natural environment;
- proposed educational / natural and cultural trails to capitalise on the richness of the Wiradjuri history;
- viewing decks and information signage to both parks;
- fitness trail loop just south of Wilks park, within the river corridor area; and
- boat access (major at Wiradjuri, minor non motorised craft access for Wilks Park).

It is important to plan activity generators within and around the park. Key elements proposed include a bike hire for Wilks Park, opposite Hampden Bridge; and a cafe associated with the future new location of the caravan park, as well as mixed use in the parcel of land opposite the entrance to Wiradjuri Reserve.

Ongoing Consultation

During the next design stage it will be imperative to collaborate further with local Elders and the Aboriginal community regarding the possible interpretation and educational opportunities relating to Wiradjuri history - natural and cultural perspectives. There is great opportunity to interweave the richness of the Wiradjuri story through the open space and linking with the new integrated Visitors Centre / Museum.

Similarly with the planting approaches, it is important that further research and discussions with Charles Sturt University are undertaken to ensure that any proposed planting predominantly reflect the original planting patterns that were present prior to European habitation - in terms of densities of tree canopy for example, and species diversity in the shrub and grasses understorey.



Above: Example of potential playground equipment.

HAMPDEN TERRACES

Hampden Terraces is a significant precinct in regards to connectivity as it links the southern areas of Riverside with the northern precinct of Wilks and Wiradjuri Reserve and provides a crossover link via Hampden Bridge to Wilks Park.

The plan aims at introducing nodes of interest and activity to visually and functionally create this link. The nodes are located at each end of Hampden Bridge, at Kincaid Street and at Sturt Street.

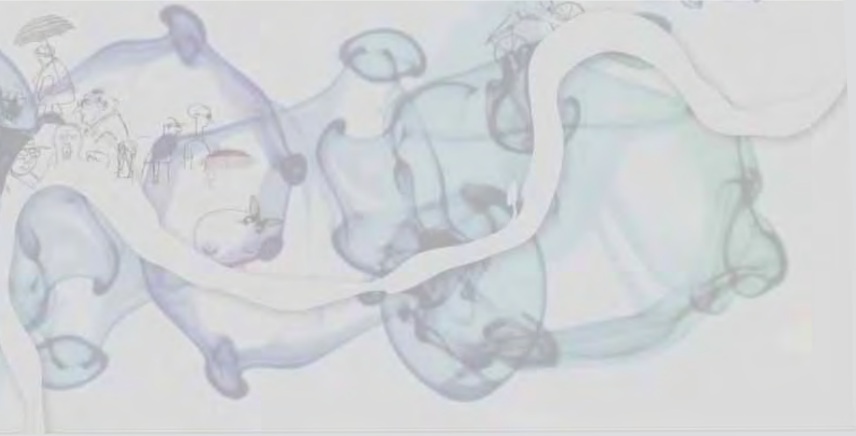
The plan also aims at addressing the current instability issues of the river bank batters along Cadell Place. Strategies have been incorporated into the design to ameliorate this situation.

The introduction of riverside vegetation in these nodes / areas as a vegetation theme to reinforce the river presence to 'bring the river to the city' enhances legibility and visually integrates the city with the riverside.

Built form analysis and densities for the area between Fitzmaurice Street and Cadell Place are also discussed in this section with the aim of providing a framework for rejuvenation in this area. The results have been coordinated with Council and integrated into the revised CBD DCP.

The key elements within this precinct plan that will be discussed include:

- Hampden Bridge
- Kincaid Street
- Sturt Street
- Built Form
- Bank Stability and Landscape Strategies
- Water Sensitive Design



The Hampden Bridge

The Hampden Bridge is considered a key element that adds character and identity to the city scape. It is important not to view this structure in isolation but as one of the pieces of the overall puzzle. A key objective of the Master Plan is to enhance the amenity, connectivity and flexibility of the open space systems whilst promoting its usage for the residents of Wagga Wagga.

The existing Wiradjuri Bridge provides poor amenity as a pedestrian and cyclist crossing point and its utilitarian character does not contribute to a positive 'Wagga Experience'.

As a result, the Master Plan proposes to retain Hampden Bridge as the major pedestrian and cyclist link between the city and North Wagga and Wilks Park. In order to reduce the burden of maintenance costs, a commercial facility in the form of a cafe or restaurant is proposed which would capture views towards the bridge and river within a high quality backdrop of mature River Red Gums.

The building would be constructed on stilts, aligned to the bridge's piers to minimise any flood related issues. The building height should not exceed the top of the bridge trusses and whilst providing a contemporary language, it should echo the simple forms and triangulation of elements of the bridge character. The use of glass is encouraged to keep a pavilion type character and materials such as timber and steel are proposed to compliment the bridge structure.

Pedestrian and cyclist access would be provided via the bridge and a small carpark would be incorporated to the south, adjacent to Hampden Avenue.

The bridge could also act as a market and festival place. It is suggested to incorporate storage elements on the deck for storing tables, chairs and marquees to allow the facilitation of functions and other activities.

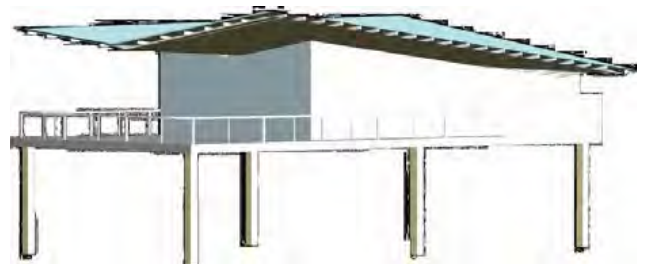
The plan also proposes a small kiosk on the city side of the bridge's abutment and to use the western deck of the bridge as a seating terrace. The kiosk and terrace could be leased to raise further revenue for the maintenance of the bridge.

The existing car park would be reconfigured and landscape enhancements undertaken to frame views towards the bridge and create a stronger visual setting.

Retaining the Hampden Bridge is considered a valuable asset for the future of the city, respecting the historic and heritage significance of the structure and enhancing the interaction with the river for residents and visitors alike.

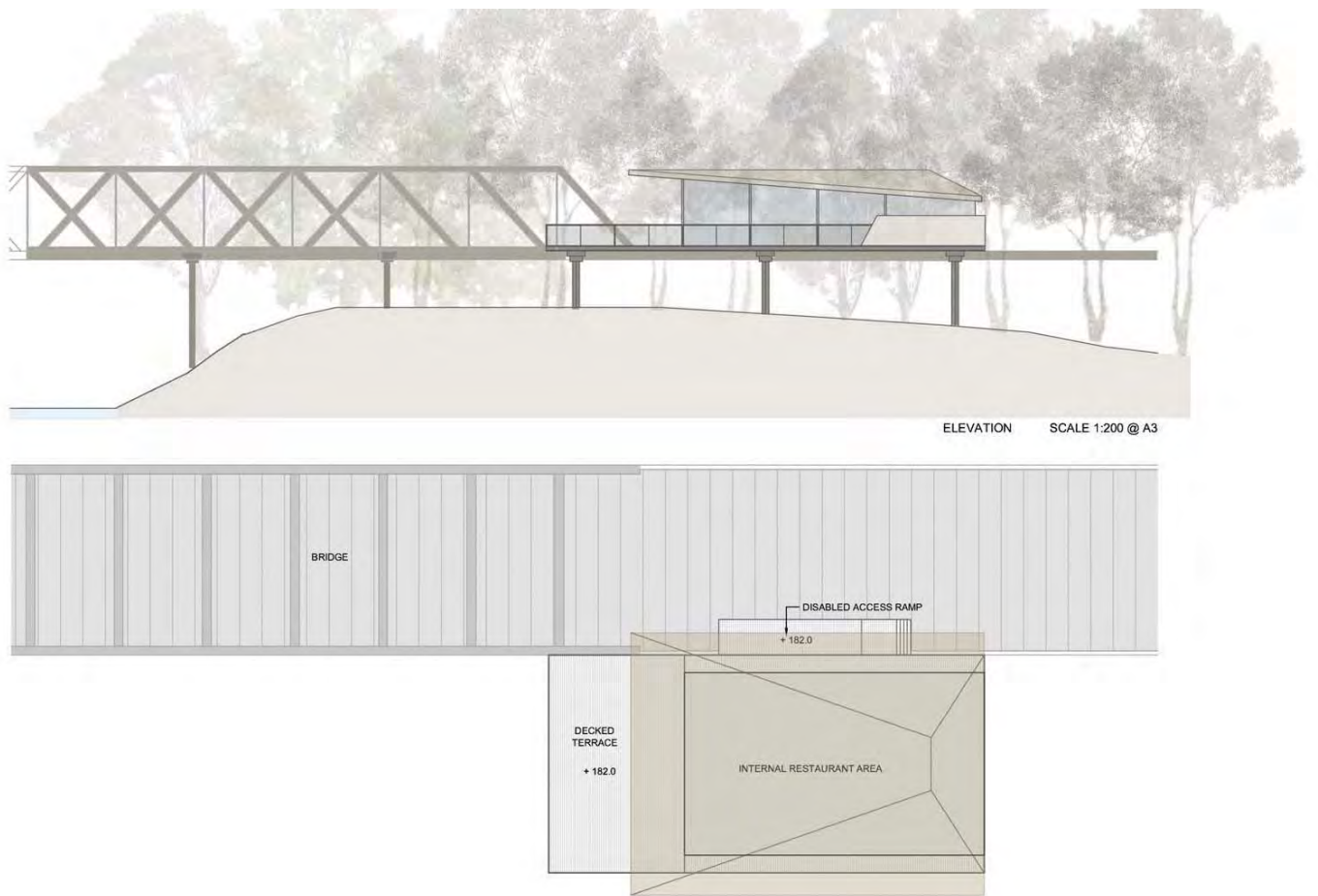
A possible compromise on the bridge retention is to retain the truss portion of the bridge and replace the eastern end with a narrower deck with concrete structure and timber railing walkway & cycleway. Potential serviceable materials from the dismantled section may be salvaged for ongoing maintenance of the remaining structure.

It should be noted that in the first instance the Strategic Master Plan recommends the retention of the bridge; however, should the case arise that commercial activities are not being able to be negotiated in the short to medium term and other funding options are exhausted then the option of removal of the bridge would need to be reconsidered.

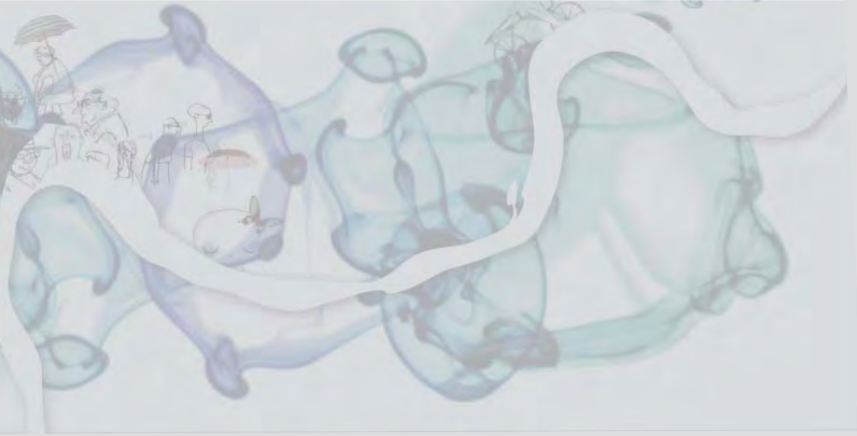


Above: 3D studies of potential architectural form of Hampden Bridge Restaurant / Function Centre





Indicative plan view and elevation of potential development at Hampden Bridge



Existing view towards Hampden Bridge



Indicative effect of potential built form integration with bridge structure





Integration of a restaurant / function centre with the bridge structure will generate activity and activate use of the bridge on the eastern side of the river



Stabilisation of the Riverbank

Due to the steep banks along Cadell Place, the levee walk would be relocated to allow gentler batters to be introduced. The proposed design would allow the removal of fill along the levee bank, thereby reducing its steepness. Cadell Place would be configured as a one way street with its road surface lifted by one metre between Kincaid Street and Crampton Street. The fill material could be recycled from the removal of fill on the other side of the retaining wall.

The intent of this configuration is to make Cadell Place a shared zone in this area allowing views towards the river with the existing levee wall acting as a balustrade. Vehicular traffic would be limited to a 10km/hr zone and be generally for service vehicle access only.

Access from the elevated Cadell Place to adjacent properties would be achieved either by ramps or steps depending on the situation and needs of each particular property. It should be noted that numerous properties provide their access from Fitzmaurice Street.

Regarding private properties, the Master Plan has identified the area between Fitzmaurice Street and Cadell Place between Crampton Street and Sturt Street as an urban regeneration zone. The Master Plan proposes to introduce mixed use, residential and commercial development to further revitalise this area.

Between Kincaid Place and Sturt Street the design proposes to elevate Cadell Place by 400mm. This would allow the retention of access to the smaller properties which are also built closer to the lane. This area would also act as a shared zone with 10km/hr speed zones for vehicular traffic.

Six specific areas have been identified that would promote urban permeability and visibility between Fitzmaurice Street and the river. These are:

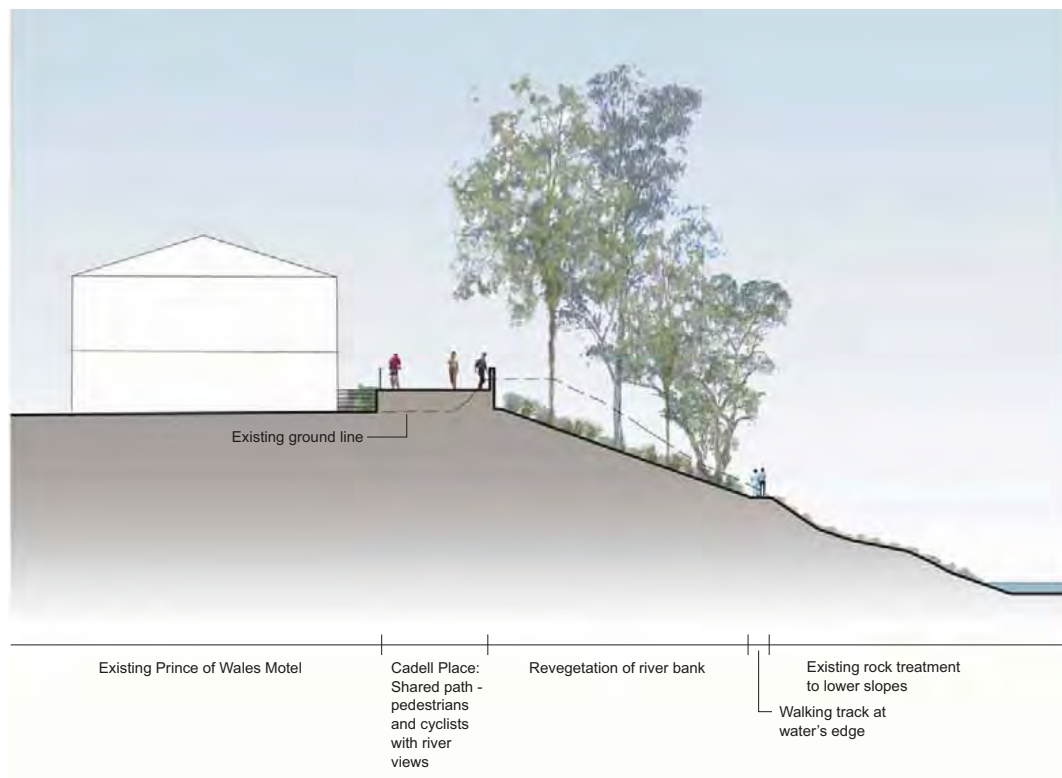
Cadell Place North

With the one way configuration, the opportunity arises to relocate the existing kerb, widening the pedestrian path in conjunction with the Cadell Place street works and ramps. The wider footpath would also allow the opportunity for street tree planting.

Mid-block Carpark

The existing mid-block car between Crampton Street and Kincaid Street is considered a key visual link between Fitzmaurice Street and the levee. It is proposed to further investigate the retention of this open space to enhance urban permeability, visibility and safety. Consideration of increasing the floor space ratios to adjacent properties as a way of offsetting commercial disadvantages to private owners could be considered and evaluated based on the merit of the development application.

In this regard the provision of arcades that act as balconies above would enhance amenity and allow views towards the river.



Section A-A through Cadell Place north of Kincaid Street



Kincaid Street

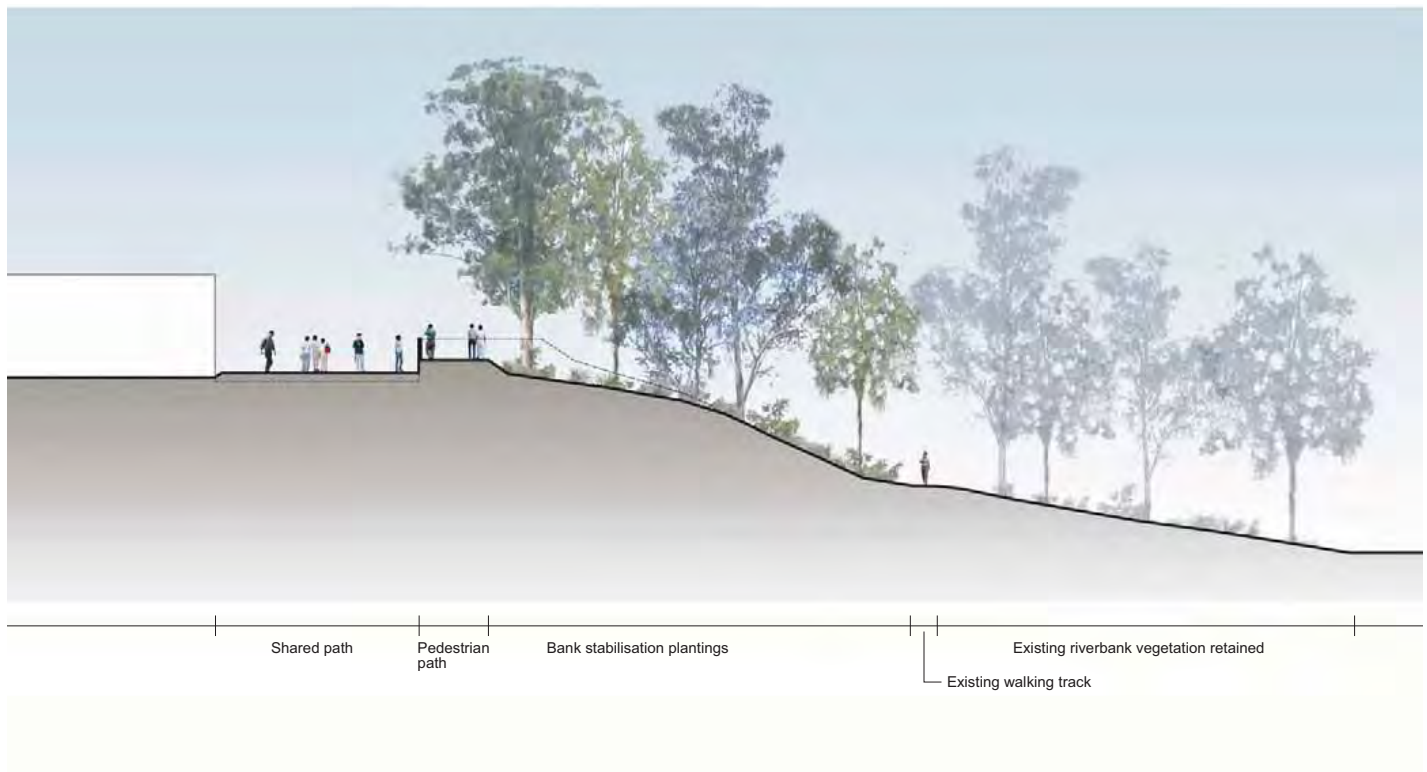
As mentioned before in the analysis section of the report, options have been considered to introducing openings in the levee. The intent of these openings is to improve permeability and visual interaction with the river. One of the critical locations identified is Kincaid Street as it allows to visually extend the city structure to the river and because of its proximity to Fitzmaurice Street.

The plan proposes to convert Kincaid Street into a pedestrian oriented plaza where it meets Cadell Place, allowing the gradient transition between the various elevated parts of Cadell Place and Fitzmaurice Street. This plaza would also provide the transition of the levee walk from city side to river side.

To enhance the setting, a cafe / kiosk is proposed with the levee opening, thereby allowing direct views onto the river. The kiosk could be commercially leased to raise funds for the upkeep and maintenance of these and other associated facilities.

The building should be fairly transparent (glass fenestration above levee level) to allow views towards the river. It is conceived as a single storey structure with a minimal footprint of 30 to 40 sqm.

It should have a sculptural form language to act as an accent feature and to create a point of interest. Refer detailed plan and montage.



Section B-B through Cadell Place south of Kincaid Street



scale 1:250 (A1)

kincaid street
detail plan

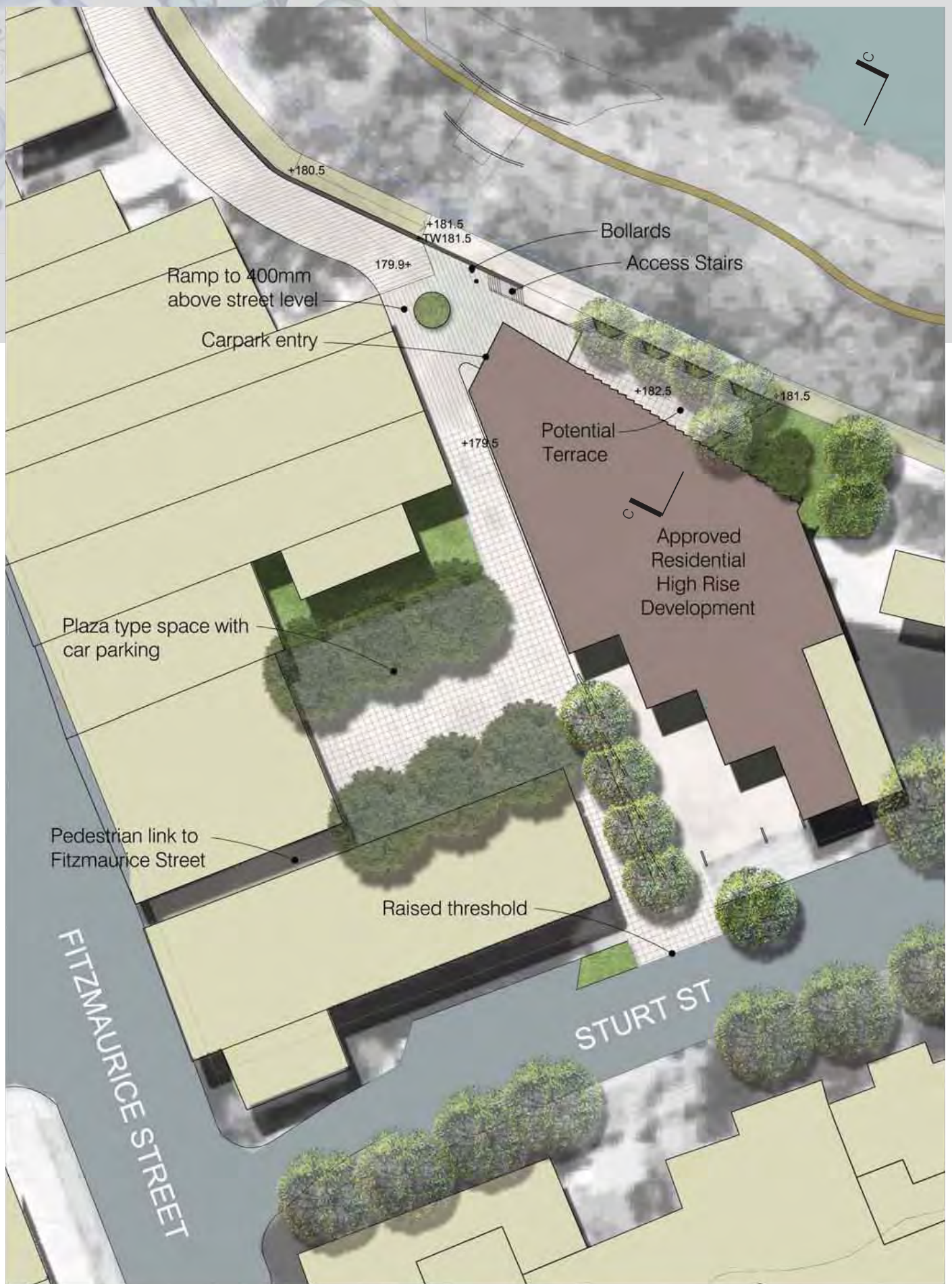




Original levee situation at Cadell Place



Indicative effect of levee treatment at Cadell Place creating a pedestrian oriented space



scale 1:250 (A1)

sturt street
detail plan





Indicative Section C-C through 9-17 Sturt Street illustrating potential built form interface with the levee

Cadell Place South / Sturt Street

There is currently a large mostly vacant lot at the southern end of Cadell Place with an approved Development Application for a ten storey residential apartment complex at 9 to 17 Sturt Street. As a result, the Master Plan reflects this situation. Nonetheless, the Master Plan encourages that the interface between the private property and the levee bank is further explored in order to mitigate unresolved / remnant open spaces that compromise the visual character along the levee bank.

Section C-C provides an indicative solution by which the space between levee and proposed development is filled in to provide a landscape buffer between the levee and the development.

The master plan generally encourages the interaction between private developments and the levee to enhance surveillance whilst potentially incorporating active spaces to enhance the interface between the urban built form and the riverfront. It is recommended that the developer be encouraged to consider the development proposal to:

- consider a small commercial space at the upper parking level over the entrance to the car park by relocating the coffee shop from the Sturt Street frontage to the river frontage. This would significantly assist in integrating the private and public spaces at levee level; and
- re-consider the "dead space" between the car park entrance and the levee to enhance the pedestrian amenity, access and safety of the area.

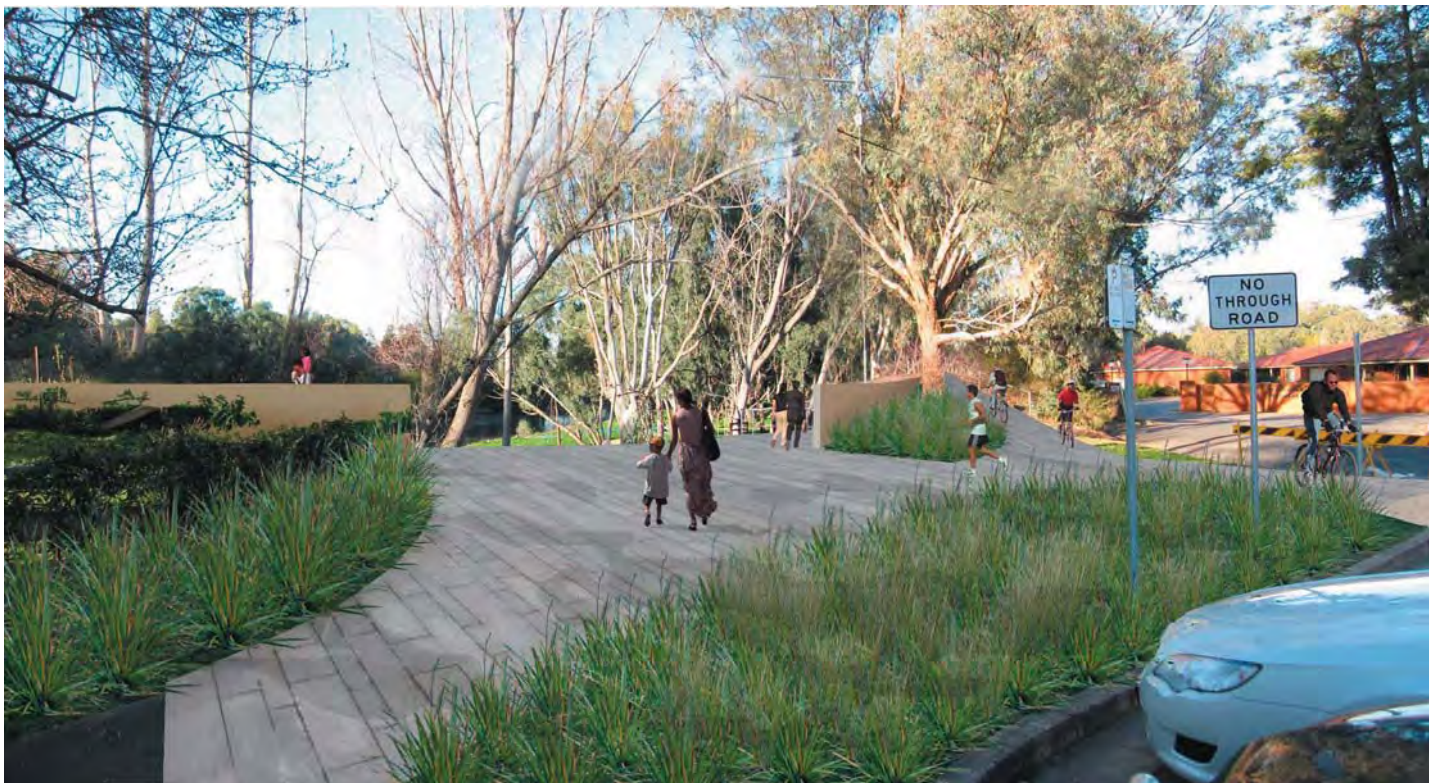
A pedestrian link in the form of a stairway is proposed at the northern end of the development site to ensure urban permeability. There is limited opportunity for the incorporation of small plaza type spaces due to access issues into the approved development. Disabled access would be provided through Sturt Street Link discussed overleaf.



DA approved development at Sturt Street and Cadell Place



Original levee situation at Sturt Street



Indicative effect of levee treatment at Sturt Street creating a pedestrian oriented space and opening views to the riverside



Romano's Place

The existing carpark at Romano's which is accessed through Cadell Place could be converted into a plaza type space, and this opportunity should be explored with the property owner. It would create a much stronger and inviting place allowing the various spaces to flow with each other, thereby creating an overall spatial ensemble and potentially attracting customers from the levee. The space could also be utilised by the owner as a beer garden or function space.

In addition to the aforementioned, there is also the opportunity to re-open the pedestrian link to Fitzmaurice Street. This would further enhance urban permeability and reinforce the pedestrian arcade network typical of Wagga Wagga.

Sturt Street Link

Just as at Kincaid Street, it is proposed to introduce a levee opening in this location. Not only does this link extend the city structure to the river, it echoes the historic river crossing and it is located in a prominent bend of the river where the integration of wetlands in conjunction with stormwater drainage cleansing would be incorporated.

This location is also where the cycle path from the south along the levee would divert onto Cadell Place, creating a pedestrian only zone along the levee between Sturt Street and Kincaid Street. Gentle ramps from the levee to streetlevel would provide access for the disabled at this location.

The levee opening is also significant in conjunction with the city interface. The Court House and Romano's, two landmark buildings interface with Sturt Street which is where the opening is proposed. Opening views to the river at this location would create an ensemble combined with the previously described section that would further exploit the unique qualities of Wagga Wagga.



Built Form at Cadell Place

THE VISION AT CADELL PLACE

The Wagga Wagga CBD currently turns its back on the Murrumbidgee River. Nowhere is this more apparent than along Cadell Place where the levee and a lack of built form combine to create a place with little life and activity. Cadell Place fails to take advantage of its surroundings to create a distinct 'laneway' character. It has failed to realise its potential as a place that links together the city and its river, or as a destination with a diverse mix of housing choice, businesses and activity.

The vision for Cadell Place is of a place with a denser built form that enables a diversity in land uses and activities to create a place with its own distinct character. It will provide accommodation for students, spaces for start-up businesses and creative industries and become a gathering space for the people of Wagga Wagga.



Artist impression of Cadell Place from Kincaid Place looking south



Artist impression of Cadell Place Riverfront as a vibrant, mixed-use area linking the riverside with the city centre (Graphic: David Lock Associates)



INCREASING THE FLOOR SPACE RATIO OF CADELL PLACE

The built form controls outlined within the draft Development Control Plan for the city centre are for a 2:1 Floor Space Ratio (FSR) with a maximum height of 16m (or 5 storeys).

As illustrated in the diagram below this may have the effect of enabling development that may wish to maximise either height or site coverage to result in either:

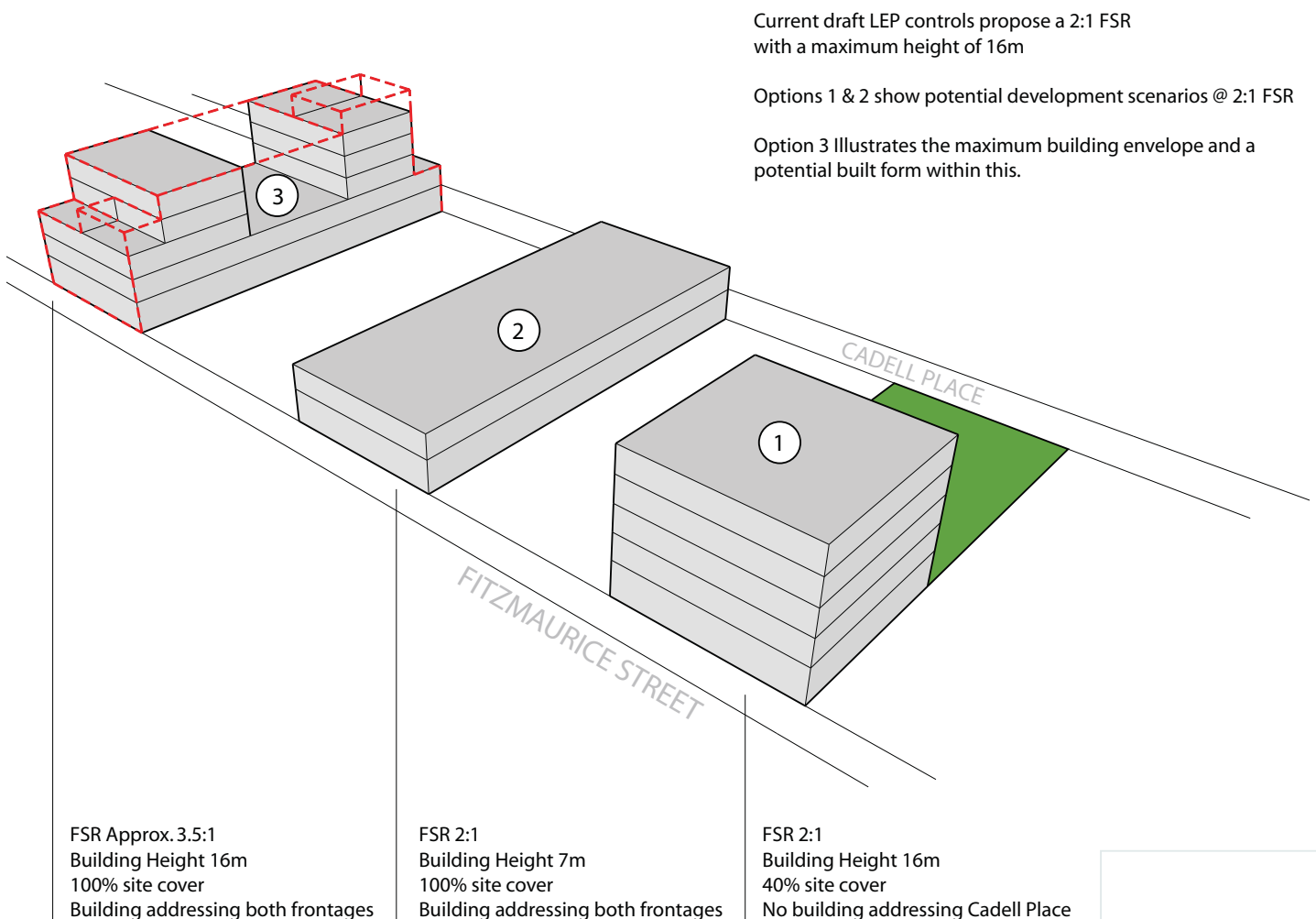
1. a, 5 storey building covering 40% of the site area; or
2. a, 2 storey building covering 100% of the site area.

In the case of the 5 storey building this is likely to result in the 5 storey element at either the Fitzmaurice Street or Cadell Place frontages with the second frontage remaining vacant or under utilised.

In the case of the 2 storey building with 100% site cover this represents an under capitalisation of the potential to take advantage of the views and amenity of the riverside on the Cadell Place side or to reinforce the 2-3 storey street wall of Fitzmaurice Street and match the potential 5 storey development on the western side of the street.

In order to allow the vision for Cadell Place to be achieved without limiting the development potential of Fitzmaurice Street it is recommended that FSRs be increased between Fitzmaurice Street and Cadell Place to allow development of 5 storeys on both frontages.

We suggest a new FSR of 3.5:1 for this area with potential allowance of an increase in FSR (not building height) if additional public linkages are provided between Fitzmaurice Street and the riverside. The potential form of development with an FSR of 3.5:1 is illustrated in option 3 below.

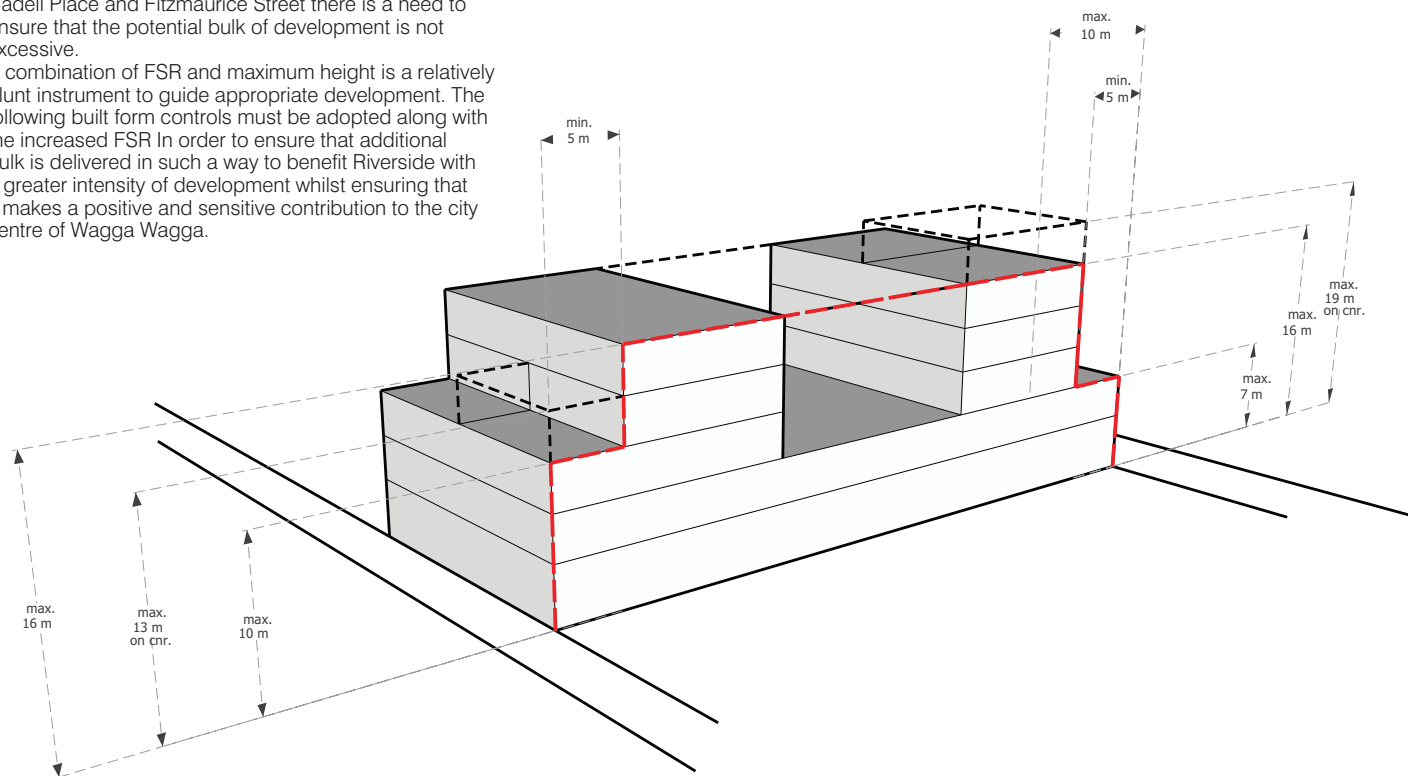




DRAFT SETBACK CONTROLS FOR CADELL PLACE

As a result of the proposal to increase the FSR between Cadell Place and Fitzmaurice Street there is a need to ensure that the potential bulk of development is not excessive.

A combination of FSR and maximum height is a relatively blunt instrument to guide appropriate development. The following built form controls must be adopted along with the increased FSR in order to ensure that additional bulk is delivered in such a way to benefit Riverside with a greater intensity of development whilst ensuring that it makes a positive and sensitive contribution to the city centre of Wagga Wagga.



Above: Illustration of the written controls. This diagram shows the maximum building envelope in red, additional 'pop-ups' at specific locations and a potential built form possible within this envelope.

Fitzmaurice Street

Design principles and guidelines include:

- zero setback from the frontage to Fitzmaurice Street (except in circumstances where existing or new public spaces are to be preserved or created);
- development on the street frontage up to 10m high, consistent with existing parapet lines of the older buildings along Fitzmaurice Street. (street wall of 10m);
- development above the street wall to be set back a minimum of 5m so as to be seen as recessive and to read as a separate built form;
- setbacks may be reduced by a maximum of 2 metres subject to the high quality architectural design of the upper floors;
- maximum building height of 16 metres (as per current draft controls); and
- the street wall at the corners of Fitzmaurice Street and any existing or new public and open connections to the Riverside may rise to 13m. This reflects the existing Wagga Wagga building vernacular of corner buildings with tower features and will help to make access ways to the riverside more legible to pedestrians.

Cadell Place

Design principles and guidelines include:

- zero setback from the frontage to Cadell Place (except in circumstances where new public spaces are to be created);
- development on Cadell Place up to a maximum height of 7m. (street wall of max. 7m);
- a deck at either the first or second floor (~4m or 7m) (above this height the decks associated with any restaurants or bars will lose their visual connection with Cadell Place);
- development above the deck to be set back a minimum of 5 metres and a maximum of 10 metres. (this is to try to ensure a semblance of consistent built form along Cadell Place);
- maximum building height of 16 metres (as per current draft controls); and
- development at the corners of Cadell Place and any existing or new public and open connections to Fitzmaurice Street may rise an additional floor (to 19m). This will help to make the access ways to the city more legible to pedestrians travelling along the levee.





Above: 3D massing study of the potential built form along Cadell Place.



the bend
precinct masterplan



THE BEND

This most prominent precinct of the Strategic Master Plan is divided into the following sub-components:

- The Beach
- Church Hill
- Civic Centre

This precinct strongly focuses on the rejuvenation of open space systems and linkages to Riverside. It incorporates a number of facilities and services that allow the community and visitors to celebrate the unique and beautiful riverside setting.

An important aspect within this precinct is the visual and spatial re-interpretation of existing elements. It is the heart of the Riverside Master Plan which celebrates the river and offers an array of spaces, places and activities for the community and visitors alike.

The Beach

A significant consideration within this precinct is the relocation of the existing caravan park beyond this zone, to allow a continuous free flowing open space system with generous public access to the river, thereby creating a memorable public domain for the city of Wagga Wagga.

In order to realise this vision, the relocation of the caravan park is critical for the following reasons:

- the nature of a caravan park is visually unattractive in such a significant setting;
- the facility would be visually dominating and detracting even if it would be re-configured away from the river bank;
- the Master Plan is providing a long term vision for Riverside Wagga Wagga and whilst the existing location of the caravan park may have been appropriate in the past, it is not considered appropriate for the future amenity of this site; and
- it is considered that the current location of the caravan park is not socially sustainable. It caters for a few community members, dominates the site and restricts overall access compromising the amenity for the community by large.

The Wagga Wagga Beach area aims to improve activation with the waterfront, and includes incorporation of a variety of functions and elements to create a rich fabric of sub-spaces. These include:

- regional Playground Facility;
- shed for hiring canoes and water sport equipment;
- new Kiosk / Cafe facility;
- rejuvenation of the existing building leased by the Bidgee Canoe Club and swimming club;
- re-establishment of a rotunda;
- extensive barbeque facilities;

- rejuvenation of the two existing caravan park toilet blocks with changing and washing facilities;
- multi-purpose grassed area appropriate for public gatherings, informal sport, picnic;
- five to six new picnic shelters;
- informal sports area;
- parking for 26 vehicles including disabled parking, bus stop and drop off zones; and
- cycle hire shed.

As part of the rejuvenation of the Beach area, the landform has been 'moulded' to create a better integration of the existing built form and levee with the landscape. This is achieved by realigning the levee level, extending the form towards the river at each end, and allowing the landform to gently batter towards the beach.

This approach allows the opportunity to make the levee visually disappear whilst also introducing the opportunity for new development north of Johnston and Church Streets in the vicinity where the main carpark to the beach is. Along this higher levee an "upper river terrace" circulation spine is created, thereby maximising the unique river views from these higher landforms.

The Wagga Wagga Beach is an iconic element in the city's history. The new landscape improves the existing situation by resolving level differences and smoothing out batters to create even transitions between the newly created park spaces and the beach; reinforcing and improving circulation for pedestrians and cyclists, and removing the dominant barren car park that currently detracts from the overall setting. This space is transformed into park space that inter-relates with a new built form behind.

Planting reinforces the riverine lower floodplain species with River Red Gums being the dominant species. Planting character ranges from open plantings of River Red Gums with dry grassing underneath to groups of mixed canopy planting to reflect the indigenous river flood plain species.

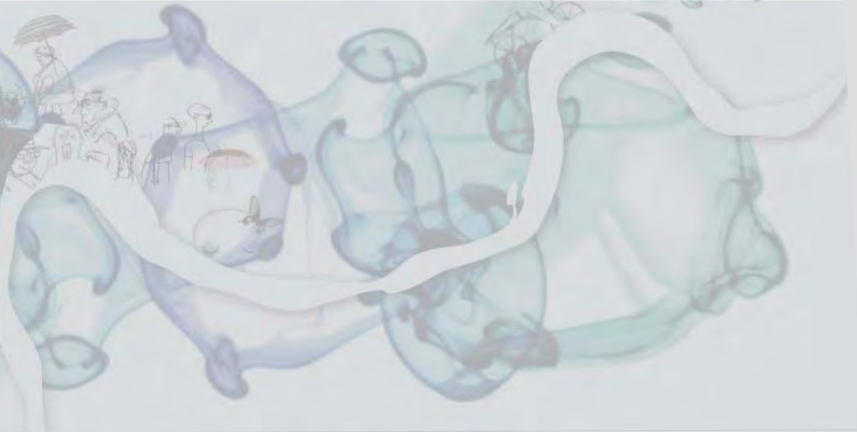
Concepts such as community gardens and a bush tucker trail should be discussed with stakeholders and the Aboriginal community in the next stage of design, as there is ample space for such elements and they would enrich the open space.

The design of the park spaces has been carefully considered to create larger open spaces suitable for large community events, such as wine festivals, music festivals, or similar. It is important that the spaces allow for flexible uses, and adaptation of different needs over time.

The large open space in front of St John's Church is transformed into large scale grassed seating terraces focussing on a large kick-around/event space below. The north-east orientation of the space is ideal for concerts. The new form interacts with the "upper river terrace" of the reformed "levee bank" behind, with the activity generators along it.

Sensitive water design elements are incorporated in the design including swales to infiltration areas prior to releasing stormwater to the river and creation of mini-wetlands along the alignment of the previous channels of the river (during times of flooding).

The car parking and road access utilises the existing road surfacing to reduce environmental impacts and cost. Bus drop-off areas and car parking for 26 cars is provided close to the beach, with the new underground carpark within the new development providing additional car parking for community use.



Cycle paths and shared paths either follow existing tracks or are re-routed to avoid pedestrian conflict in the areas of high pedestrian use (i.e. the central area.)

New facilities such as BBQs and picnic areas are provided, in close access to carparking and to overlook the playground or other open space areas.

Key to the concept is the introduction of elements that used to be part of the heart of Wagga Wagga Beach, for example a rotunda and generous open grassed spaces that interact with the beach. The design is flexible and adaptable to accommodate future needs, and suits a wide range of community events and needs.

An opportunity to bring back the historic 'Gumi' races should be investigated as it would engender community spirit and provide opportunity to enliven the already rich tourism and community event calendar.

Mixed Use / Residential / Hotel Facility

This development would incorporate the following:

- either mixed use / residential or 80 room hotel facility;
- underground carpark for the development; and
- public access underground car park for approximately 200 vehicles.

The intent of this development is to provide a visual 'anchor' and introduce active spaces that enhance safety and are complimentary to this precinct. The development should incorporate facilities open to the public such as cafes, restaurants, retail etc and the architecture should be of a high standard to act as a landmark building.

The massing of the development tapers towards the intersection of Johnston and Church Streets to allow views towards the beach and towards St Michael's Cathedral and the former Convent from the beach.

The building mass is divided into two components connected by a single storey link. These components are similar in volume and mass to the developments to the south such as the Watermark Complex or the Police Station just east along Johnston Street and are sympathetic in scale to the built form of this precinct.

Below this three storey development at levee level an underground multi-storey carpark is proposed in two levels. This carpark would be located in close proximity and replace the existing one, providing 200 spaces compared to the existing 195 spaces. In addition, the car park would provide

approximately 158 spaces for the proposed development. Access to the beach could be achieved through gates in the retaining wall that would act as the levee. The retaining wall would be backfilled to provide a gentle molded landform transition towards the beach area. The distance to the beach from this facility would be similar as in the current situation.

This development is considered significant as it could greatly assist in generating revenue for the overall Riverside development.

BUILT FORM GUIDELINES

The site has the potential to contribute more to The Beach, The Bend and Wagga Wagga than just space to park cars. However, the site is currently outside of the levee bank and within the floodplain of the Murrumbidgee River. The opportunity exists to reconfigure the levee as highlighted in the Analysis plans, to allow development to happen within some of the car park area and provide a more fitting transition to the river than the current retirement village which crouches behind the levee.

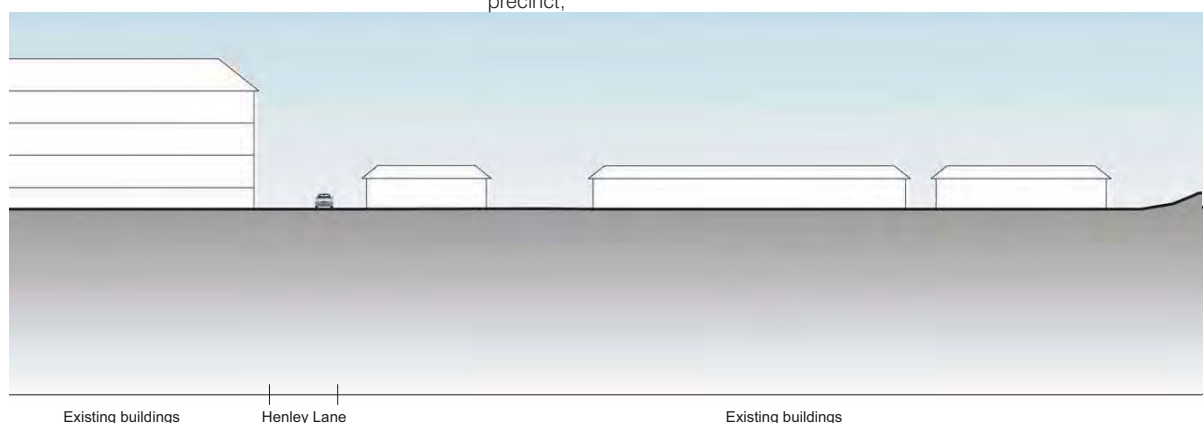
This site is an opportunity to provide for additional accommodation especially for tourists in a location that capitalises on its proximity to the riverside and will also allow more people to stay in Riverside rather than just walking through it once. It is an opportunity to remove a large area of at-grade car parking from the public realm of The Bend as well as to provide a new destination along Riverside and more people within Riverside to add vibrancy.

It will be important to ensure that any development provides car parking for beach visitors in numbers consistent with those currently provided.

It is critical to undertake further detailed investigations to ensure that no impacts on flooding occur as a result of this development.

Guidelines:

- provide tourist accommodation within the bend to provide a new 'pearl' on the riverside path;
- ensure the built form creates and enhances links between the city and river;
- ensure built form respects views of the river, churches and the Watermark development;
- ensure that the development capitalises on views of the Murrumbidgee River and the Beach;
- ensure building height and bulk respects the neighbouring Church Hill precinct;



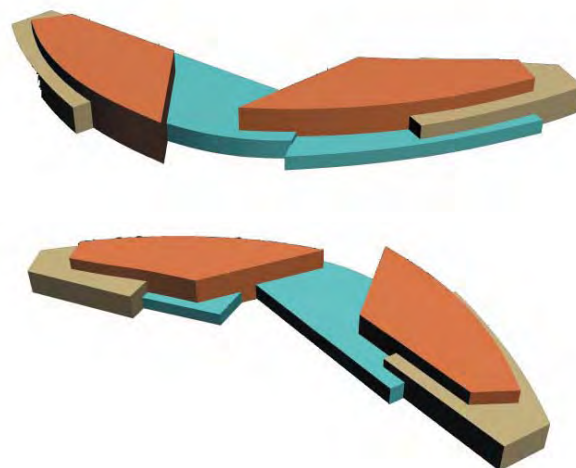
Section D-D looking north through potential built form and levee nearby the Beach (refer to plan for section location)





Section D-D looking north through potential built form and levee nearby the Beach (full context)

- ensure that any new building interacts directly with the levee top providing activity at and potentially an expansion of the levee top itself;
- minimise inactive facades on all development by providing active uses such as cafes, restaurants and retail at the ground floor;
- utilise the built form to bridge the gap between the ground plain and the levee top;
- use the height difference between the levee top and ground level to incorporate structured car parking in a semi basement; and
- ensure any building demonstrates best practise environmentally sustainable design to demonstrate Councils commitment to the environment.



Above: 3D massing studies of potential architectural form

HOTEL AREAS

Element	Area (m2)	Floor to floor heights
Garage footprint	6200	3m
Ground Floor	3500	5m/3.5m
1st Floor	2440	3.5m
2nd Floor	1730	3.5m
	7670	m2

PARKING DEMANDS

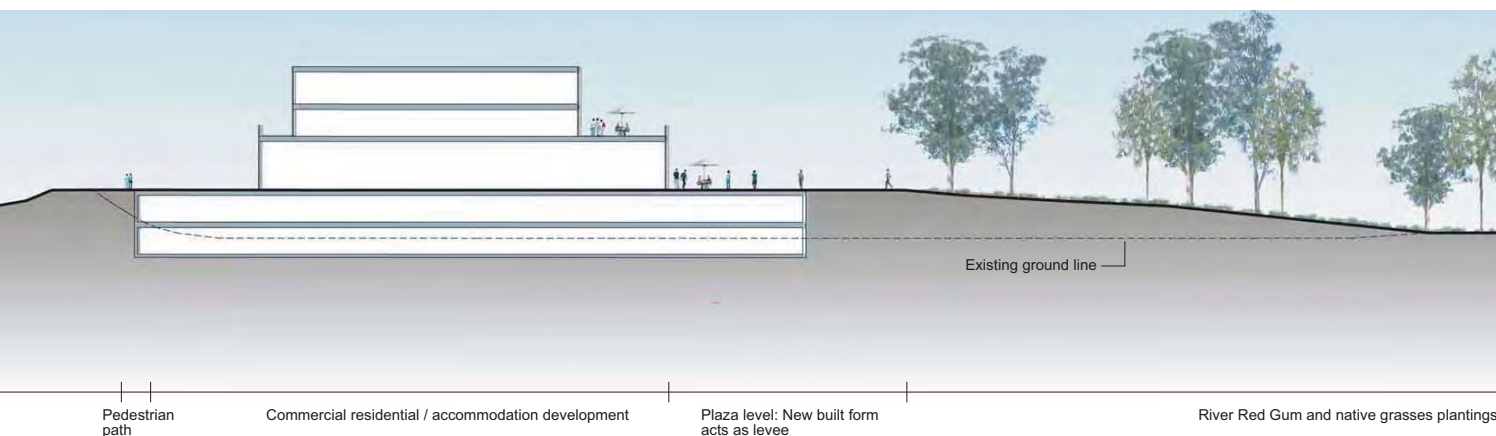
	Comments	Units/Participants	Parking Requirements
Hotel Guest Parking	1space per room	80 rooms	80 spaces
Weddings	15 spaces per 100m2	400m2	60 spaces
Employee parking	1 space per 2 employees	36 employees	18 spaces
			158 spaces

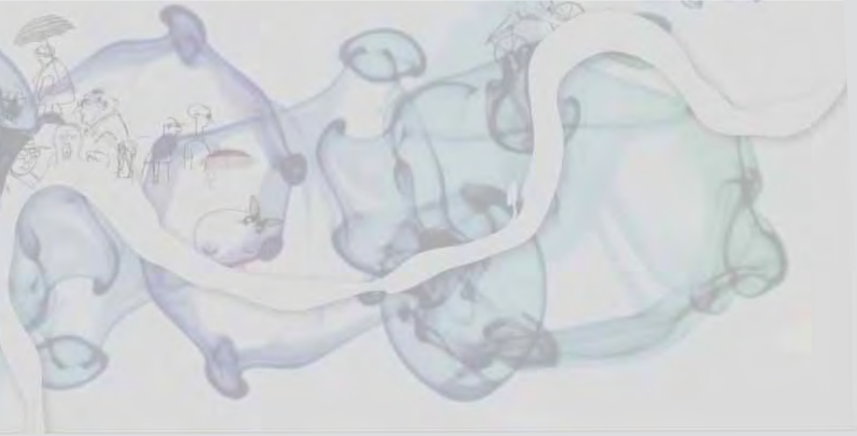
Public Parking based on 30 spaces per 1000m2 **202 spaces**

Available new parking 360 spaces

PARKING POTENTIAL

	Area	Comments	Spaces Available
New area	Level 1 - 5956m2	30 spaces per 1000m2	180 spaces
	Level 2 - 5956m2	30 spaces per 1000m2	180 spaces
			360 spaces
Existing area	7800m2	40 spaces per 1000m2	195 spaces





Improvements to caravan park interface

RIVERSIDE FORESHORE IMPROVEMENTS

With the recommended relocation of the caravan park, there will be opportunities for major improvements to the interface between the caravan park levels and the beach / river area. At present, very steep edges are unattractive and unsafe and form barriers, accentuated by planting, to the river.

New proposals include:

- re-shaping of the steep batters to more gentle falls to integrate the new landscape;
- opening up of existing shrub plantings to maximise views through to the water;
- introduction of stormwater management/rock cascades/wetland filter areas to stormwater discharge areas; and
- general landscape improvements including: bank stabilisation plantings, River Red Gum dominant tree plantings, areas of native grassing and mown grass.



The Rocks/Church Hill



Panorama illustrating the magnificent presence of the river, The Rocks, with the background of St. John's Church will be preserved. Improved stone steps, timber viewing deck and new cycle way will be provided along with additional riverside plantings.



Section F-F through "The Rocks" showing retention of the existing rock platforms, and enhancement with low grasses and shrubs.



Regional Playground

The early photos of the water play items at Wagga Beach present opportunities for "perceived safe" water play, and related activities such as trampolines. With the relocation of the caravan park, there will be major improvements to the interface between the caravan park levels and the beach, including space for a regional playground. Key design principles proposed are:

- design a facility that complements the play provisions already evident in Wagga Wagga;
- design a facility that is unique to the setting of the place;
- design fitting to the unique natural setting, i.e. contemporary use of natural materials focus rather than typical "suburban" play equipment";
- explore concepts for a waterplay park that caters for all age groups;
- explore concepts for fitness equipment, especially for the elderly;
- consider impact on views from the other side of the river and from the city to the Beach area;
- design for the flooding risk; and
- involve the community in the design - from planning to resolution - explore potential for local arts involvement through Council's Public Art Advisory Panel.



Early photos (courtesy Wagga Wagga City Council) of the playground at the Wagga Beach - note large scale trampolines with water slide behind.



On of the two gate pillars to the original Wagga Wagga Beach entry- these are currently in the museum and they could be reinstalled at the new entry gates to Wagga Wagga Beach.





Early photo of Wagga Beach with Church steeple behind; and photo of today, with the area dominated by the caravan park.



Examples of potential play equipment





Existing situation at Church Hill



Indicative effect of built form treatment and levee walk at Church Hill





Plan view of the area surrounding the proposed major community facility



Civic Precinct

A major public plaza and community outdoor space is proposed to create a strong link between Fitzmaurice / Baylis Street and the riverside incorporating the Civic Centre, the Civic Theatre and Wollundry Lagoon. This open space link would act as a strong visual element to create a cohesive ensemble of the current disparate setting whilst capitalising on views towards Church Hill to reinforce the unique character of Wagga Wagga.

This major community plaza which crosses Tarcutta Street would provide a revitalised open space where festivals and markets could take place. During special events Tarcutta Street could be closed off to further reinforce this link between the city's centre and the riverside whilst also enhancing safety.

The incorporation of multi function grassed spaces adjacent to the proposed major community facility offers the opportunity for flexible outdoor spaces such as display areas, performance spaces etc in conjunction with the facilities provided within the major community facility.

Major Community Facility

A major community facility is proposed at the intersection of Morrow Street and Tarcutta Street. The building has the potential to house an array of functions including:

- conference facility for 800 to 1100 delegates (approximately 800 banquet style and 1100 theatre seating);
- flexible Blackbox theatre space;
- integrated Museum and Visitor Information Centre;
- commercial / retail spaces; and
- underground car park for approximately 360 spaces.

The building's massing has been carefully 'moulded' to integrate with the urban fabric whilst taking into consideration key view corridors and vistas that reinforce the setting and connectivity to the river.

The 3D study illustrates the massing of the complex with the larger building to the north of the Morrow Street axis. The composition is a series of masses that rotate from being perpendicular to Tarcutta Street to being parallel with the riverside whilst dropping in height in a southwards direction. This approach allows to create a dynamic composition that articulates the overall scale of the building.

The higher northern building frames views towards Church Hill whilst relating in its massing to the Civic Theatre. The southern block steps down in height and the lower building elements facing the riverside provide a transition between built form and natural environment whilst also allowing views towards Church Hill when approaching the complex along Tarcutta Street from the south.

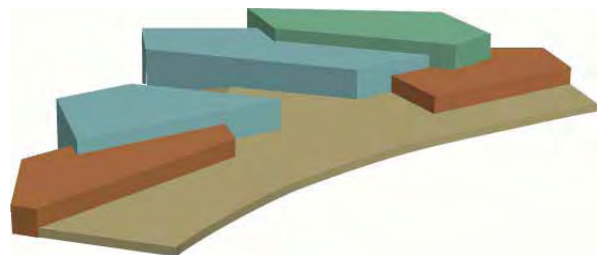
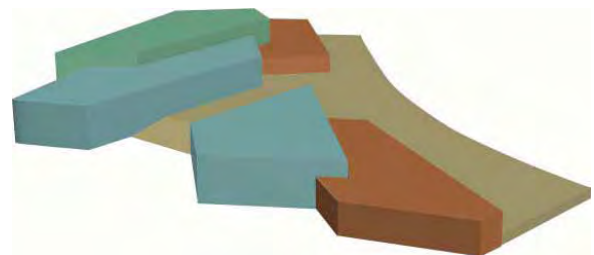
The two building blocks are linked through a common foyer/facilities below levee level. This approach allows to further articulate the overall scale of the complex but also provides visual and functional connectivity to the river by respecting the Morrow Street axis.

A generous buffer zone to the north of the building provides a transition zone to Church Hill whilst the smaller building masses to the south create a transition with the built form along Tarcutta Street.

The axis of the northern building is oriented east west to minimise western sun exposure and maximise permeability to the Riverside.



Above: Indicative 3D massing study in context



Above: Indicative 3D massing study for the major community facility



Basement Level

The lower car park is approximately 4 metres below existing street level. The wall facing the river would substitute the existing levee. Approximately 212 car spaces could be incorporated within this level.

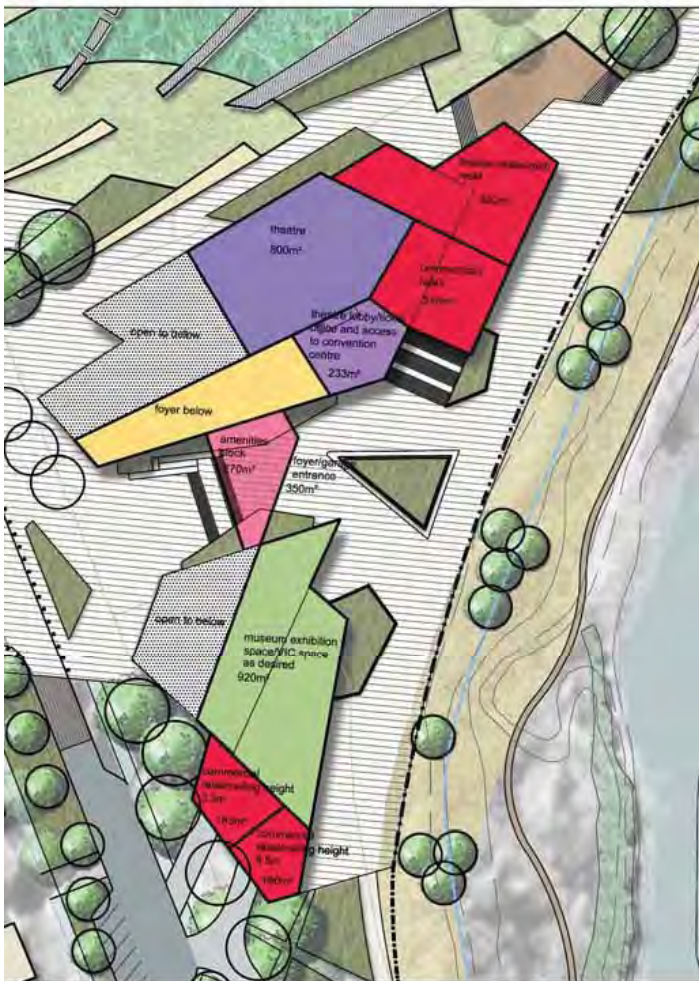


Ground Floor Level

The ground floor is conceived in two levels; the street level comprised of the areas facing Tarcutta Street and the areas facing the river which would be one metre below street level, and incorporating the car park, storage facilities and other auxiliary areas. This level also includes the link between the northern and southern blocks. Potential commercial spaces could face Tarcutta Street to activate the street front.

Also at this level, the wall facing the river would substitute the current levee. The excess fill, depending on further investigation, could possibly be recycled in other areas along the riverside project.



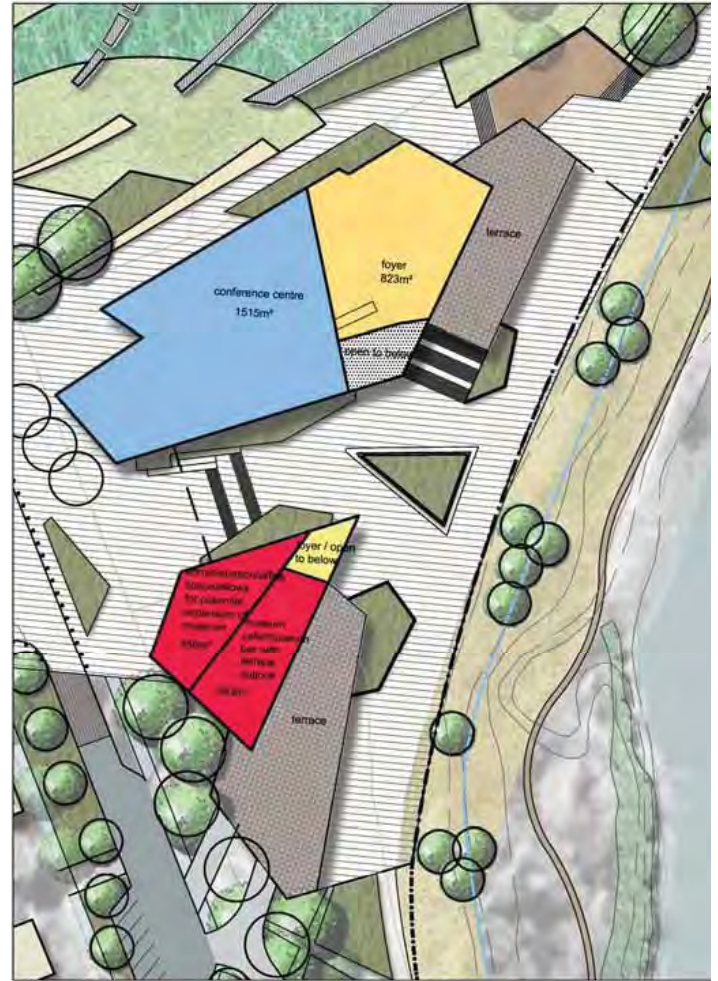


Levee Level

The levee level would be closely linked with the street level through the introduction of generous open and doubled high ceilings spaces.

This level could focus on cultural activities such as a museum and theatre spaces. The Visitors Centre integrated with the museum space could be incorporated either within this level or at street level in the southern block. The VIC could also act as a ticket office for the theatre during non-operational hours.

Potential commercial spaces would face the riverside to create an active and engaging riverside front.



Conference Level

The proposed conference centre could be integrated on the upper level of the northern block. This approach minimises inactive frontages at street / levee level when the centre is not operational. Access could be provided both internally and through exterior stairs.

The southern block could be used for commercial spaces which could utilise the panoramic riverside views from a roof terrace. Complimentary uses such as restaurants and cafes are encouraged as they provide services to both visitors and the community by large.



Upper Conference Level

The upper level of the northern block could house auxiliary spaces for the conference centre such as break-out / meeting rooms and catering facilities. Also at this level roof terraces would provide panoramic views of the riverside and the adjacent cityscape.

The table on the adjoining page provides an overview of the potential spatial program and car parking requirements for such a facility. Regarding parking, it has been assumed that all functional components of the facility would seldomly run at full capacity at the same time. Hence the visitors parking demands for the conference centre have been excluded.

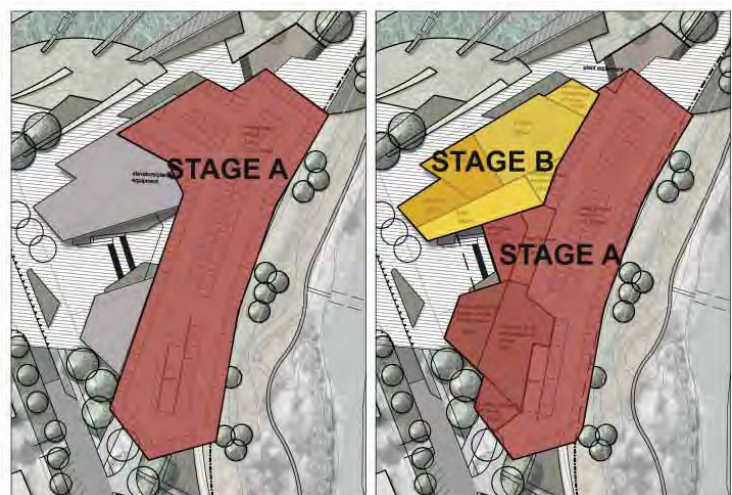
In the rare event that all facilities run at full capacity simultaneously, strategies such as remote parking combined with shuttle bus services could be considered. As part of a long term strategy, Council could consider the development of a multi-storey car park facility at the existing Council car park at Morrow Street. The close proximity to the centre is ideal for consideration as part of a long term parking strategy should the need arise.

Note, ceiling heights have been kept to a minimum to reduce the overall scale and bulk of the building.

The complex would allow the possibility of a staged construction process. This would provide flexibility of the development and its implementation. The development would be staged in accordance with demand and resources at costs to be determined at the time. There would be an active pursuit of grants to enable development.

Currently, the preferred staging plan is proposed as a two stage process shown in the figures below.

In response to public submissions from the public exhibition phase, the Strategic Master Plan has been amended to note that Council will engage with Museum advisors and its own staff during the design phase for any Museum facility as part of the Major Community Facility.

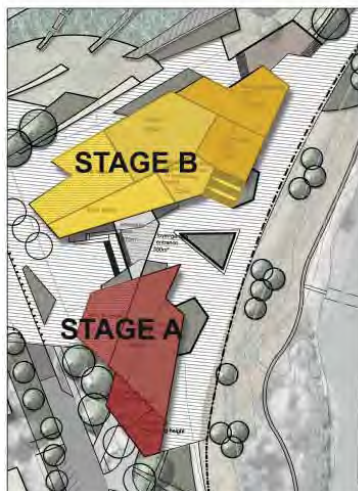


Basement Level

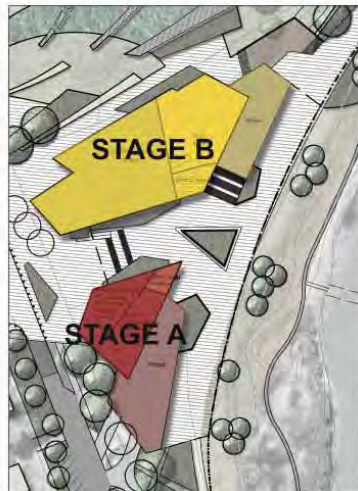
Ground Level



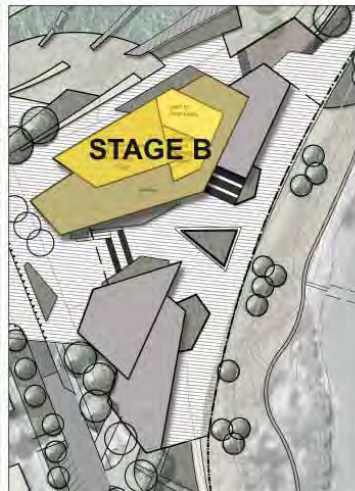
NORTHERN BLOCK					Recommended car parking	
CONFERENCE CENTRE						
Area	Comments	Units/Participants	Parking Requirements	Parking spaces		
1500m2 - Main Hall	Ceiling height 6.5m	800 max.	1 space/3 participants	267		
800m2 - Foyer/Expo	Ceiling height 6.5m		1.5 spaces/200m2	6		
1000m2 - Breakout rooms/Facilities	Ceiling height 2.7m		1 space/40m2	25	25 Sub-Total	
Sub-total extra area		3300m2		298 Sub-Total		
PLAYHOUSE						
800m2 - theatre, backstage area	Ceiling height 6m	(Black Box Potential)	1 space/5m2	160		
50 - office	Ceiling height 2.5m		1 space/45m2	1		
100m2 - rehearsal space	Ceiling height 2.5m		1 space/45m2	3		
230m2 - foyer	Ceiling height 6m		1 space/30m2	8		
Sub-total extra area		1180m2		172 Sub-Total	172 Sub-Total	
OTHER FACILITIES						
Restaurant/retail at levee level	Ceiling height 3.5m	550 m2	1 space/25m2	22		
Commercial/retail at levee level	Ceiling height 3.5m	375 m2	6.1 spaces/100m2	23		
Café/street level	Ceiling height 5.5m	250 m2	1 space/25m2	10		
Commercial/retail street level	Ceiling height 3.5m	390 m2	1 space/45m2	9		
				64 Sub-Total	64 Sub-Total	
Sub-total extra area		1565m2		534 Sub-Total		
					534 Sub-Total	
Note: Ceiling heights are based on a 0.5m structural sandwich - This may be adjusted at a later stage for key levels to 1m						
SOUTHERN BLOCK						
MUSEUM						
Area	Comments	Units/Participants	Parking Requirements	Parking spaces		
Integrated Visitors Centre and Museum	Ceiling height 4.5m to 6.5	870m2	1 space/30m2	25		
Museum & VIC back of house	Ceiling height 2.5	725m2	1 space/45m2	16		
Retail/museum store	Ceiling height 4.5m	98M2	6.1 spaces/100m2	6		
Foyer	Ceiling height 10.5	350m2	1 space/30m2	12		
Sub-total extra area		2043m2		59 Sub-Total	59 Sub-Total	
OTHER FACILITIES						
Restaurant	Ceiling height 4.5m/3.5m	343m2	1 space/25m2	14		
Office Upper floor	Ceiling height 3.5	739	1 space/45m2	17		
Sub-total extra area		1082m2		31 Sub-Total	31 Sub-Total	
				90 Sub-Total		
					90 Sub-Total	
Note: 20spaces+5disabled+5coach+8Caravans have been provided adjacent to the centre						
CENTRAL BLOCK						
Area	Comments	Units/Participants	Parking Requirements	Parking spaces		
Toilet facilities etc	Ceiling height 2.5m	270m2	Not calculated			
Foyer garage entry	Ceiling height 2.5m	350m2	1 space/30m2	12	12 Sub-Total	
		10% of total area except conference facilities				
		-1 below street level				
					363 Total	
Total car park requirements					624	
Sub-basement -0.5m below Street level						
Area	Comments	Parking spaces				
4081m2	Based on 37 spaces/1000m2	152 spaces				
Basement @ -4 metres below street level						
Area	Comments	Parking spaces				
5771m2	Based on 36 spaces/1000m2	212 spaces Sub-Total				
					364 Spaces Total Parking	
Total Area					8745	



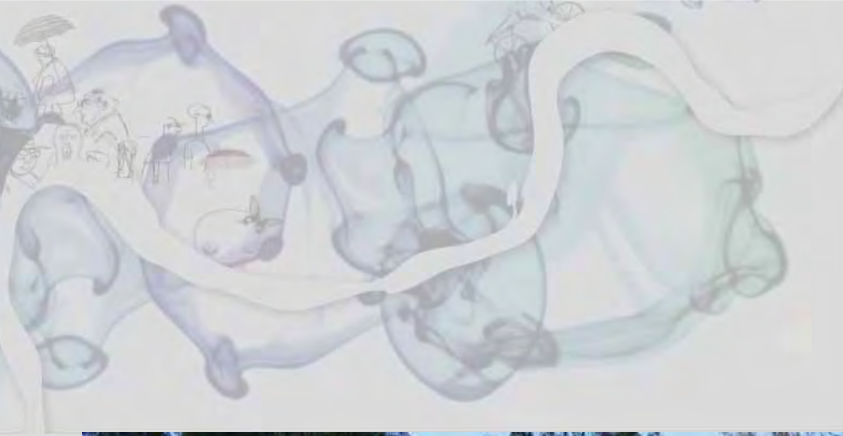
Levee Level



Conference Level



Upper Conference Level



Existing situation of the levee nearby the Visitor's Centre



Indicative effect of levee treatment at the proposed major community facility



BUILT FORM PRINCIPLES FOR A MAJOR COMMUNITY FACILITY

Key built form principles include:

Retain open space as a visual extension of Morrow Street. This will visually reinforce the connectivity of the river, echo the urban structure of the city and provide linkages to the riverside. This link would be reinforced by the architecture of the Major Community Facility flanking it either side, hence improving legibility.

Allow potential views from Tarcutta Street to Church Hill. The church spires are considered a key identity element of Wagga Wagga. As part of reinforcing this identity, it is recommended to exploit views along Tarcutta Street as part of the arrival sequence for visitors. As a result the built form steps down towards the levee.

Articulate the massing of the buildings to reduce its apparent scale. Articulate the façade to add visual interest, provide for sun shading and reduce the visual scale of the building mass.

Integrate the proposed Major Community Facility visually with the existing Civic Centre. The proposed built form of the Community Facility is considered significant in scale. This is required in order to accommodate the various functions within the centre. Allowing the proposed major community facility to be an 'extension' of the existing Civic Centre creates a 'natural' extension of this precinct towards the river whilst integrating its built form into a single ensemble.

Incorporate daily parking demands within the centre as much as possible. The centre should accommodate daily parking demands including parking for the visitor's centre. Due to the nature of conference venues with strongly fluctuating parking demands, it is recommended to provide for a 'base' amount of parking spaces in order to maximise the investment return and utilise its prominent location for other uses besides the river front.

Introduce active frontages to the street and the levee as much as possible. Avoid inactive frontages that may create an unsafe environment. Avoid parking levels at either street or levee level.

Integrate spatial functions of erratic user demand above ground. It is important to retain active frontages at street and levee level. Hence it is recommended to allocate conference venue spaces above these levels.

Maintain a simple and 'clean line' architecture that is bold and contemporary. The architecture of the centre should reflect its own character whilst identifying opportunities which may echo key elements of the other buildings of the civic precinct. This would assist in creating an overall composition that integrates the precinct into a cohesive urban ensemble.

Allow the architecture to abstractly reflect the character and massing of surrounding civic buildings in the precinct. Consider a façade treatment that reflects creativity and the arts.

Investigate opportunities to reflect the river setting. Consider the introduction of visual clues and themes that reflect the river setting of the centre.

Introduce a 'carpet' type plaza that unifies the various elements and buildings into a singular composition.

Apply sustainable design principles.

BUILT FORM GUIDELINES FOR A MAJOR COMMUNITY FACILITY

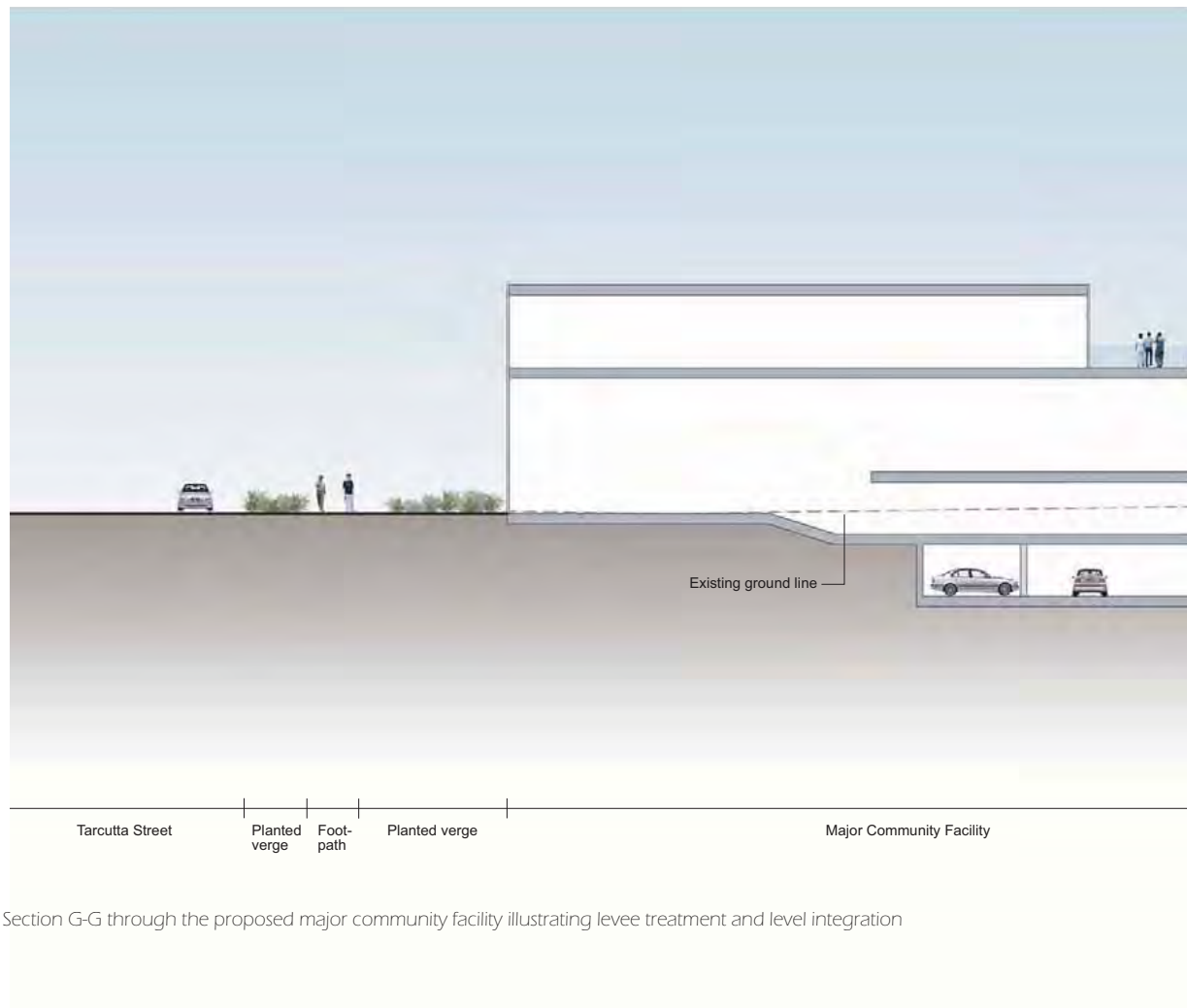
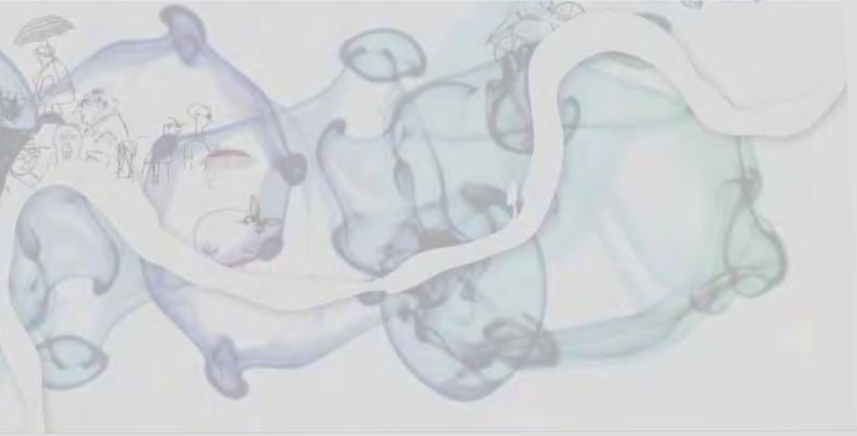
The site of the current visitor information centre has the potential to be the key junction between the city centre, Civic Precinct and riverside in a revitalised Wagga Wagga. However, this location is currently a point of severance between the city centre and the river as connections are cut by Tarcutta Street and the levee and the site is occupied by at-grade car parking and isolated civic buildings which do little to encourage or facilitate movement through to the river.

This site is an opportunity to create the link between the city centre and the levee top that is so important. A new community facility can provide much needed community and conference facilities in a form that bridges the gap, provides another 'pearl on the string' of the riverside and can be recognised as an important building, thereby encouraging the use of the riverside and levee top as a place for community celebration.

Of utmost importance is to ensure that new built form does not become another barrier to the riverside by blocking pedestrian movements or presenting blank facades to the river and levee as is currently the case at Cadell Place.

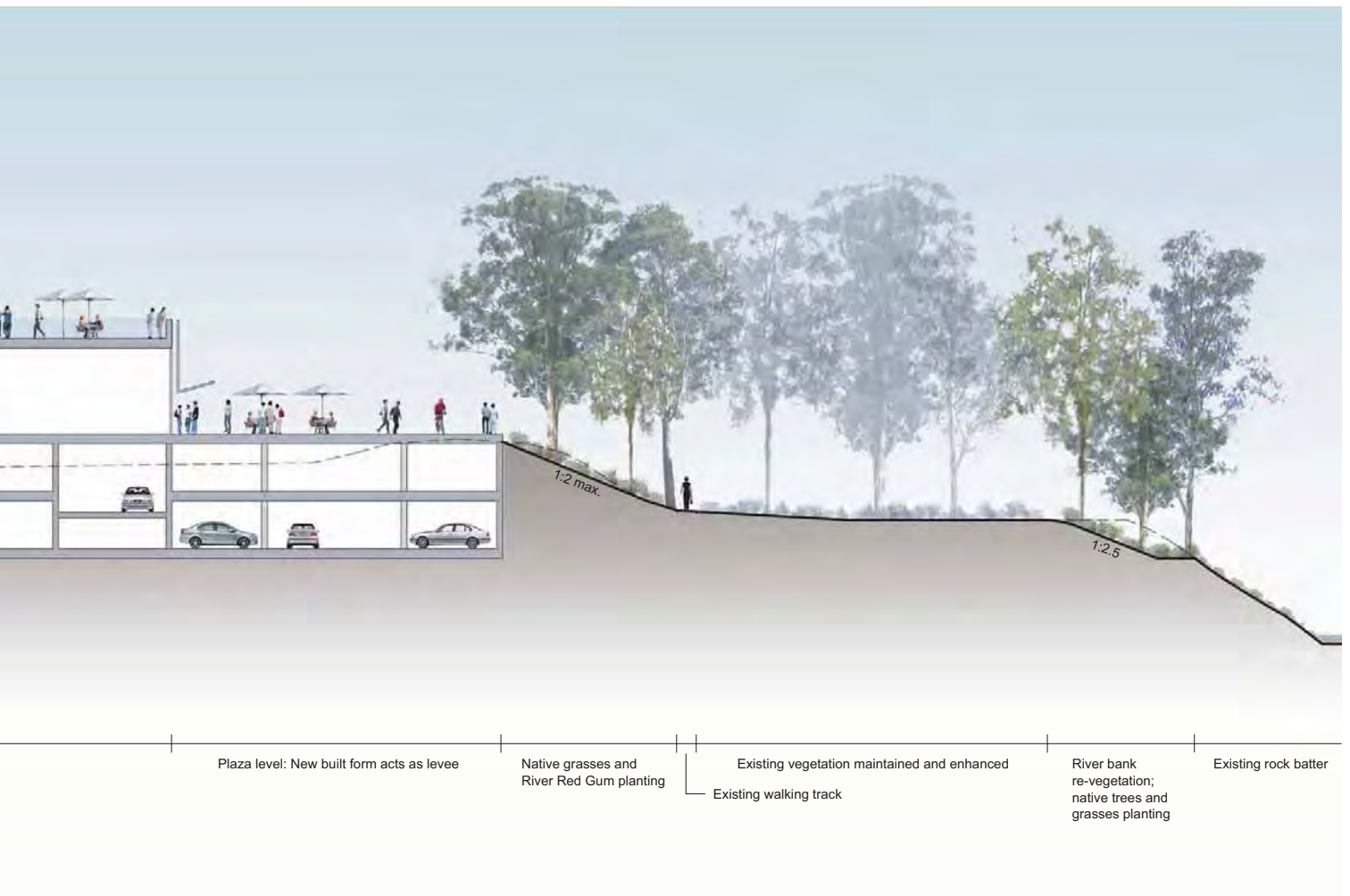
Guidelines:

- provide community and conference facilities adjacent the levee to provide a new 'pearl' on the riverside path;
- provide community and conference facilities to link and integrate the city centre and riverside with the civic precinct;
- ensure the built form creates and enhances pedestrian links between the city and river;
- ensure any building is seen as an important destination when viewed from the city centre down Morrow Street;
- ensure building height and bulk respects the neighbouring Civic and Church Hill precincts;
- ensure that any new building interacts directly with the levee top providing activity at and potentially an expansion of the levee top itself;
- utilise the built form to bridge the gap between the ground plain and the levee top;
- minimise inactive facades on all development by ensuring that larger conference facilities are located on upper levels;
- use the height difference between the levee top and ground level to incorporate structured car parking in a semi basement;
- ensure any building demonstrates best practise environmentally sustainable design to demonstrate Councils commitment to the environment; and
- ensure any building demonstrates best practise design to demonstrate the importance of the destination and the community for which it is provided.



Section G-G through the proposed major community facility illustrating levee treatment and level integration







Visitor Information Centre Car Park

The plan proposes a VIC car park located south of the complex. The car park includes disabled parking for 5 vehicles, 20 car spaces, 8 caravan spaces and space for 4 coaches. The car park access is configured as a one way in a southerly direction and allows caravan vehicles to exit directly onto the street for ease of manoeuvrability.

The use of permeable pavers is strongly encouraged within parking areas to visually soften these spaces and introduce sustainable initiatives.

River Bank Improvements

Easier connection between the city and river at this critical zone is high priority. At present the steep river banks pose maintenance and potentially bank stability issues. As shown in the Site Analysis drawings, in the levee Improvements Plan and as also shown in Section H-H, it is proposed to move the levee form towards the city in this central precinct to better visually and physically link the city to the river and also to improve flooding, improve bank stability and provide a more maintainable, sustainable landscape treatment for the batters.

The re-shaping of the batter into a more gentle form (maximum 2:1, preferred 2.5:1) will enable the planting of indigenous grasses underneath a canopy of River Red Gums and Casuarinas.

The more gentle slopes will provide easy access to the river and opportunities for passive recreation / picnicking.

Tarcutta Street enhancements

As part of the traffic calming measures along Tarcutta Street, it is proposed to introduce angled street parking. This would further allow easy access to the Major Community Facility and Riverside. It is recommended Council investigate the feasibility to rear end parking to enhance safety. The number of parking spaces gained along Tarcutta Street would be comparable to the number of parking spaces available in the existing car park at the former gas works site.

Regarding future expansion of car park availability, the Plan has identified the current car park at Morrow Street and O'Reilly Street for a potential multi-storey car park facility.

The elimination of one lane in either direction along Tarcutta between Thompson Street and Johnston Street allows the integration of the angled parking. The transition from two lanes to single lane configuration would be achieved by creating a left turn lane south of Thompson Street. A similar configuration could be adopted north of Johnston. A preliminary traffic study has been undertaken to confirm the feasibility of this approach. However, up-to-date traffic data of Tarcutta Street is required before a final consideration of recommended lane reductions is undertaken.

The introduction of landscaped blisters and street trees would enhance the streetscape and articulate the parking areas. As shown in the "Green Fingers" theme, Tarcutta Street is one of the key areas where undergrounding of the existing powerlines is strongly recommended to achieve this vision.

Development Site North of Wollundry Lagoon and Tarcutta Street

As part of the overall Master Plan, the opportunity exists to include a development site appropriate for mixed use north of Wollundry Lagoon and Tarcutta Street adjacent to the Seniors' Community Facility. The development could assist in raising revenue for the instigation of the Master Plan initiatives.



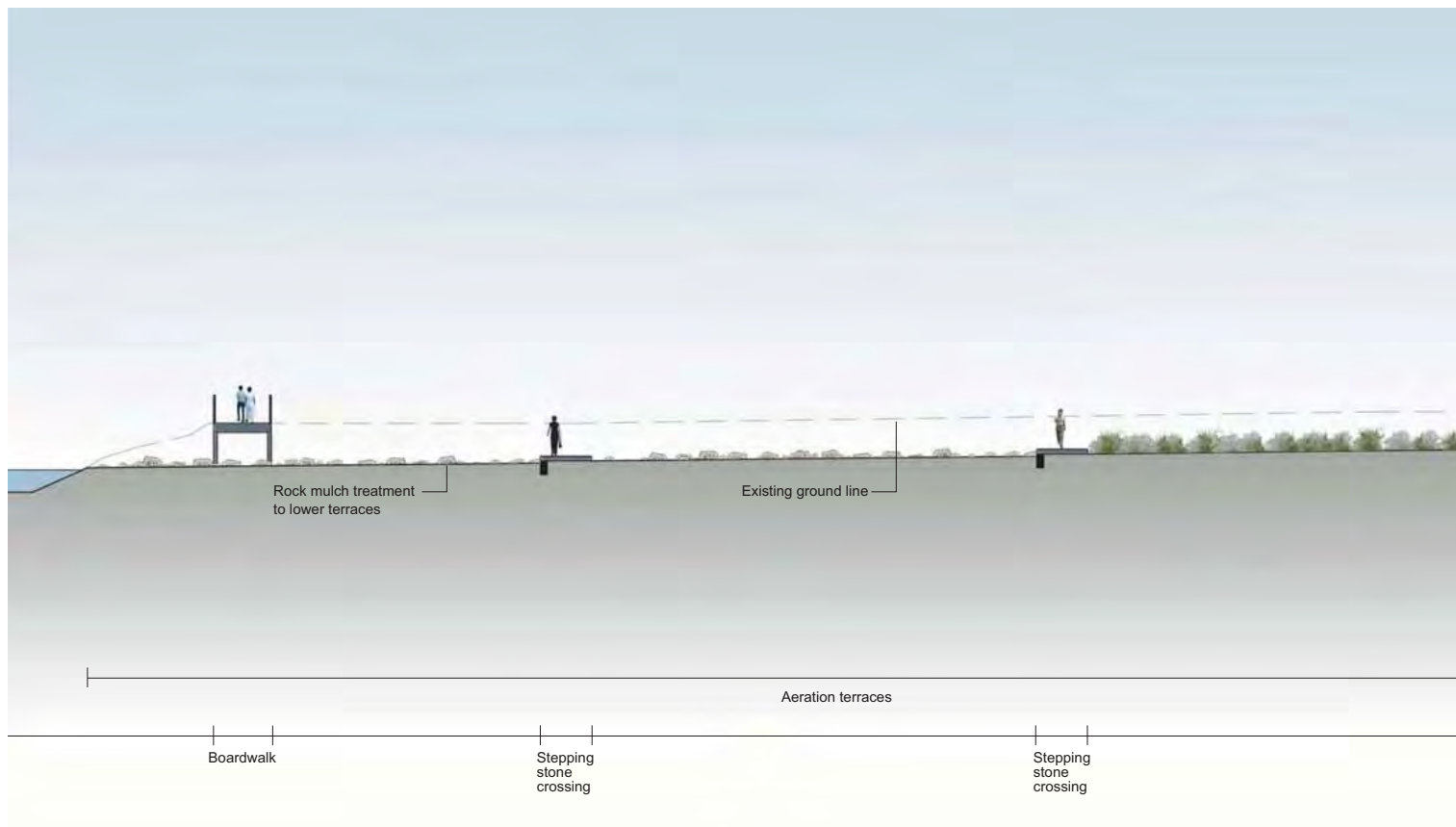
Section H-H through the area south of the Major Community Facility Scale 1:250







Above: Stormwater initiatives plan diagram



Section 1-1 Through Tarcutta Street - Scale 1:250



Below and Right: Images of the monthly Farmer's Market along the edges of Wollundry Lagoon, and the weekly Market on Myers Carpark. The new proposals will further enhance the central civic spaces and places.





RIVERSIDE SOUTHERN ENTRY

The analysis stage (Section 03) identified the need to create an effective and legible "gateway" into the Riverside Plaza area - to create a strong southern entry for Riverside, along Tarcutta Street. It also identified the opportunity for the central civic area to demonstrate WSUD initiatives, and Tony Ireland Park is in a critical location as it forms the southern edge of the site boundary and link across to the river. In addition it, receives a lot of stormwater that currently goes untreated into the Murrumbidgee River.

Existing issues / opportunities of Tony Ireland Park

This pocket park surrounds the remaining end of the Wollundry Lagoon, bound by O'Reilly / Thompson Streets and Tarcutta St and is State of NSW Land. The land also runs in a wide verge strip east of O'Reilly Street, (refer photo bottom left). It is also the location of the previous Black Smith shop.

There are many safety and environmental issues that are of concern due to the existing condition and nature of the reserve. In particular:

- secluded, heavily screened unsafe public space;
- poor integration between stormwater elements and landscape;
- poor, non-compliant level transitioning to street levels;
- siting of the electric substation in the main visual access to the park from O'Reilly Street; and
- heavily constrained area with underground SW, services and infrastructure
- the lagoon water quality is seriously degraded as a result of significant overload of stormwater pollutants on a very small pond;



Photos of the existing site- substation box in key entrance space from O'Reilly Street; along the levee bank to the north; internal photos of the pond in the visually secluded park; to stormwater inlets and structures within the park setting.



- the lagoon is linked to the groundwater table, resulting in substantial drawdown of the water level in summer periods;
- the lagoon water level is several metres below Tarcutta St level, limiting its visibility, and exacerbating the safety of users in the Park area.

Creating a Strong Southern Entry

The Riverside Master Plan proposes to invigorate this park as it is located in a pivotal relationship to the other proposals for the Civic heart of Wagga Wagga. "Bring Back Wollundry Lagoon" is a concept that brings an above ground drainage channel/swale back into O'Reilly Street, extends the water of the lagoon across Tarcutta Street to create a bold entry statement. It also improves stormwater management through introduction of wetland filters to the existing water body. Key elements that are considered as a long term strategy, include:

- creation of an entry to the south Tarcutta Street Civic Precinct in the long term;
- integration of grass seating terraces towards the levee and a viewing platform to capitalise on the magnificent view to St. John's Church spire (refer adjacent photo);
- capturing (and recycling) the stormwater from the adjacent large Myers Carpark and O'Reilly and Thompson Streets, directing the stormwater into new swales, a pollutant "drop off" terrace and wetland filters;
- raising the water level of the lagoon so that both the park area and the lagoon are visible from Tarcutta and Thompson Streets;
- taking the Lagoon 'off-line' in respect to the major stormwater discharges from Wollundry Lagoon and the SW subcatchment stormwater pipe, as the means to enhance water quality/amenity of the lagoon and surrounding park, and bypassing the large storm discharges around the lagoon;

- linking the lagoon via a higher level pipe to an extension on the eastern side of Tarcutta St;
- re-aligning a section of the existing levee to better integrate with the landscape, improve flooding, allow gentler slopes to the river bank, and improve visual and physical access to the river from the city;
- providing the opportunity for utilising the recycled stormwater or irrigation of the public parks spaces in this area.
- providing improved picnic facilities and shelters in correlation with the VIC to the surrounding river park spaces area; and
- providing strong entry planting of Eucalypts to Tarcutta Street.

The reduction in stormwater pollutant loading, the isolation of the Lagoon from the groundwater table, and the raising of the water level, may be simply achieved by:

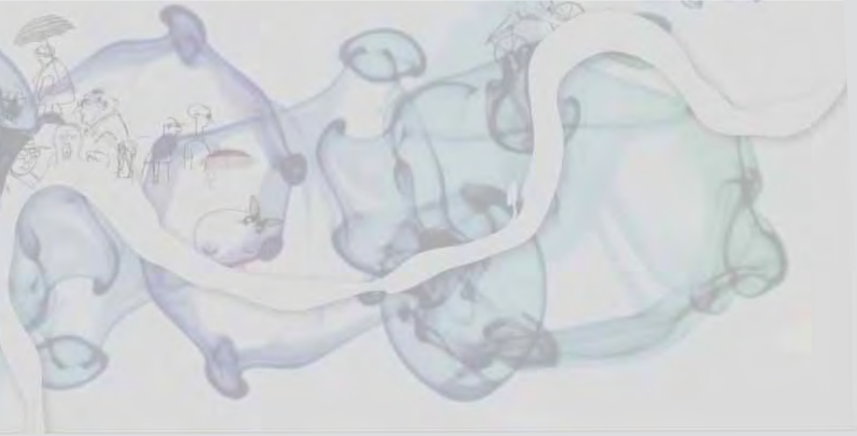
- diverting the Wollundry Lagoon main drain around the Lagoon, by extending the drain from the current inlet into the Tony Ireland Lagoon, to the outlet structure at Tarcutta St;
- filling the bed (and burying the extended main drain) of the current Lagoon with earth excavated from the Wetland on the east side of Tarcutta St, to raise the Lagoon by 1.5 m;
- incorporating a clay layer into the fill over the current Lagoon bed, to prevent seepage losses to the groundwater; and
- directing the discharge from the swales into the raised Lagoon.

These works are considered a long term priority and it is envisaged that the funding currently available for sustainable initiatives for WSUD, as well as a Murrumbidgee River management would assist in providing the majority of funding required for the works to become a reality.



View to St John's Church Spire from the proposed viewing deck adjacent the shared path on levee bank.

Detail plan showing proposed improvements to create a strong southern entry for Riverside.



Riverside Community Brainstorm Session - August 15, 2009



MAKING RIVERSIDE A REALITY

IMPLEMENTATION

The Riverside site constitutes a beautiful environment, the economic capacity of which is not currently being harnessed. For Riverside Wagga Wagga to be successful and sustainable into the future, appropriate revenue and support will be required.

A market assessment study has been undertaken to inform the Master Plan regarding potential land uses and development sites.

With the limited funding available to support the realisation of the Master Plan, key strategies have been incorporated to enhance funding and / or reduce maintenance costs. These include:

- The Plan seeks the potential for more people to live and work along the river, mixing housing with retail whilst capitalising on views and increasing values of properties;
- developments within flood prone areas have been minimised to reduce risk of flood damage. Only minor structures such as existing public facilities or kiosk/cafe type structures are proposed;
- the Master Plan identifies opportunities for significant development sites within the precinct to generate revenue such as the development at the beach and the major community facility. All proposed development will be consistent with the zone objectives of the city's new LEP;
- the integration of small kiosk points for commercial activity associated with recreation such as kayak, bicycle, boat or other equipment hire, cafes etc to promote commercial activities by the riverside and generate revenue for the sustainability of the plan;
- the integration of public meeting places including night time activities such as moonlight cinema or other open air concerts or festivals provides a further framework for commercial activities and the quality of life of Wagga's citizens;
- the incorporation of self-managing landscapes to keep maintenance costs down and to reflect sustainable landscape management practice;
- the introduction of water sensitive design initiatives which allow further funding to be pursued; and
- finally, the opportunity exists to establish a Riverside Friends group of interested citizens to aid with planting, construction and regeneration of the natural landscape linked to education and community service.

INFRASTRUCTURE

A strategic civil infrastructure assessment has been undertaken (Refer Appendix C) to investigate service provision and identify any issues to potential development sites. The report concludes that the various development sites have no major difficulties in regard to service connections and that most of the services providers see no issues in attaining connection to the required services. The potential need for upgrades and extension can be expected with developments of the nature of larger developments such as hotels/mixed use or the restaurant on Hampden Bridge which is located away from existing development areas.

Any upgrades or service line extensions would be undertaken as part of the particular development and assessed by the particular service provider once the specific requirements have been identified. At this point any works relating to the provision or connection of services are considered of an ordinary nature.

The Concept of Implementation

The Riverside Wagga Wagga Strategic Master Plan is a significant project for the city of Wagga Wagga. The realisation of the project objectives and strategies will require determination, commitment and funding.

The preparation and delivery of a strategic master plan is founded within a strong strategic planning framework and has strong government support across local and state government.

There are a number of implementation mechanisms and development models available to ensure the delivery of the various objectives and strategies contained within the Master Plan.

The next section of this chapter identifies the preferred implementation model for the agencies and groups responsible for the implementation of the project.

Following this are 6 sections which set out the actions recommended to implement the core themes of the Master Plan contained within the earlier sections of this document. These actions are grouped into the 6 sections according to the type of action and the body responsible for implementing them.

Type of Action	Typical Implementation Body
Statutory Planning Framework	WWCC
Public Realm Improvements	WWCC / LPMA
Public Development	Public Agencies
Private Development	WWCC / LPMA
Facilitation	
Riverside Management	WWCC
Public Transport Improvements	WWCC



Implementation model

In order to be able to implement the Master Plan it is necessary to assemble a 'vehicle' that can take the objectives and strategies established in the planning phase and convert this to development outcomes delivered 'on the ground'.

This vehicle will need to be able to drive key stakeholders in the planned direction. These key stakeholders are distinct from the group responsible for preparing the plan which put the ideas and directions on paper.

The model recommended to be used is a multi-organisation project group that comprises a variety of hand-picked stakeholders that suit the particular objectives of the Master Plan being implemented. Such a model has a number of benefits in relation to harnessing cross-organisational co-operation and decision making process. Such an approach will also encourage a wider degree of 'ownership' of the plan from a range of stakeholders.

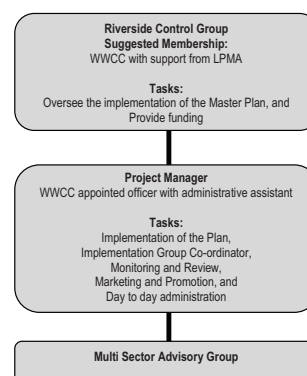
Therefore, it is recommended that an implementation structure be formed along the following basis:

CONTROL GROUP: A Control Group would be responsible for funding and overseeing the Project Manager and Implementation Group. This should comprise City of Wagga Wagga with support from LPMA.

PROJECT MANAGER: A project or 'place' manager should be appointed by Council to have full time responsibility for the implementation program. This person could also have one administrative assistant as support. In order to achieve the desired objectives and strategies of the Plan there is a need for co-ordination between various arms of government and other agencies. This can be achieved by the appointment of a Masterplan Project Manager to manage the implementation of projects within the precinct. The project manager would also manage the Implementation Group and be responsible for monitoring progress.

MULTI SECTOR ADVISORY GROUP: Membership to the implementation component of the Project Group could include the organisations listed in the flow diagram below. These organisations are envisaged to play specific implementation roles. The role and purpose of the Group is not to revisit the strategic planning and design concepts but to focus on the details of implementation. Representatives would be responsible for making decisions.

Implementation Model Diagram



Action Table 1 - Implementation Model

	Actions	Typical Implementing Body
Action 1	Establish a Riverside Master Plan Control Group charged with implementing the objectives and strategies and actions of the Plan. This group will be responsible for the ongoing funding and implementation of the projects and programs of the strategy.	WWCC and LPMA to lead a wider group of NSW Transport and Infrastructure, RTA, RIC, Private Traders, Private Land Owners, Business Groups and Community Stakeholders.
Action 2	Appoint a Project Manager and administrative assistant charged with: - Implementation of the Master Plan; - Project Group Co-Ordination; - Co-ordination of funding; - Monitoring and review; - Marketing and promotion of Riverside; and - Day-to-Day administrative functions.	WWCC and LPMA



Statutory Planning Framework

The City of Wagga Wagga Local Environment Plan and Development Control Plan need to clearly articulate and encourage appropriate development, provide certainty to developers and provide the tools for those who are assessing development proposals to facilitate the easy transition from the existing conditions to the desired outcomes at Riverside.

Planning Controls must be clear, concise and unambiguous to provide as much certainty as possible and to prohibit undesired outcomes especially within the City's Heritage Conservation Areas.

However, the controls must also be as flexible as is appropriate to allow for a changing property market. They must find an appropriate balance between certainty and flexibility.

Amendments to the planning and development strategies and controls should be undertaken in a comprehensive and consolidated manner. A number of planning mechanisms are proposed to achieve the identified outcomes.

These include:

- Amendments to the LEP including changes to the proposed FSR for Cadell Place;
- Inclusion of a local policy within the LEP for Riverside;
- Rezoning of land where possible to assist in implementing the vision; and
- Incorporation of the Strategic Masterplan as a reference document to the Development Control Plan.

Public Realm Improvements

Public realm improvement will help to support the Riverside by:

- facilitating pedestrian and cycle movement;
- increasing the vibrancy and vitality of the centre through promoting interaction;
- helping to facilitate private sector investment and development through the creation of an attractive place; and
- showing the commitment of WWCC to revitalise and reinvigorate the riverside.

The riverside should be one of the focal points for the social, economic and civic life of Wagga Wagga. It is therefore recommended that the public realm improvements are undertaken in the areas identified within the Master Plan to ensure a high degree of street level amenity for pedestrians. Improved linkages to the riverside and between 'pearls on the string' should be at a very high standard, supporting the promotion of a more walkable centre.

The following table draws together the actions required to improve the riverside precincts and provides guidance on the priorities and staging of them.

An indicative Public Real Improvement list is provided to assist in prioritising key elements. The table outlines the various key elements within each precinct that are required to be built to make the Master Plan a reality. The adjacent columns prioritise each element into three categories.

Staging which refers to a value from 1 to 5 and provides an order of priority of which item needs to be built first. This should not be confused with a project staging plan.

- 1 – Elements that require to be in place before others can be built or elements that can be instigated in the short term, are inexpensive and highly effective.
- 2 – Elements that require a modest investment and/or are critical to realise the vision.
- 3 – Short to medium term, elements to be instigated when funding is available
- 4 – Elements that are medium term or more expensive
- 5 – Elements that are considered complimentary but not essential

The second column provides a urban design value judgement from 1 to 5 in terms of its urban design significance in contributing to the overall implementation of the Riverside vision.

- 1 – Key elements that strongly contribute to realising the Master Plan vision or that need to be built for other significant components to follow.
- 2 – Significant elements that strongly contribute to realising the Master Plan vision.
- 3 – Complimentary elements that enhance the Master Plan vision.
- 4 – Complimentary elements with a lower priority.
- 5 – Long term elements less critical to the realisation of the Master Plan

The last column provides an economic value judgement in making Riverside a reality, prioritising elements that are considered economically significant from 1 to 5.

- 1 – Short term, inexpensive, access/movement importance etc
- 2 – Short term, upgrading of existing facilities (e.g. cycle ways, picnic shelters, BBQ facilities)
- 3 – New development medium term
- 4 – New development longer term
- 5 – New development longer term less priority

It is worth noting that in numerous instances there is a significant correlation between the last two columns.



WIRADJURI RESERVE			
Elements	Stage	Urban Design Value Judgement	Economic Value Judgement
Boat ramp	1	1	1
Access road	1	1	1
Access road car parking- permeable/grass/gravel	1	1	1
Access road barriers	1	1	1
Car / boat parking (ecotrihex / grass pave)	1	1	1
Ecological rehabilitation of 4WD tracks	1	1	2
Access road lighting	1	2	1
Picnic areas with picnic tables	1	2	2
Sporting field	1	4	4
Pedestrian trails	2	1	1
Fencing for protected areas	2	1	1
Tree planting	2	1	1
BBQ facilities and picnic shelters	2	2	2
Native grassing	2	2	2
Pedestrian / cycle signage	2	3	3
Sporting field levee / spectators mounding	2	4	5
Viewing deck	3	1	3
Facility block upgrade	3	2	2
Mown grass	3	2	2
Recycled water irrigation to mown grass area	3	2	2
Wiradjuri interpretation signage/bush tucker trail	3	3	3
Caravan Park	3	3	3
Adventure playground	3	3	4
Adventure playground	3	3	4
Cycleway	3	4	3
Planting of ephemeral wetlands	4	3	3
Pedestrian trail boardwalks	4	3	3
Road bridge crossing over channel	5	1	4

WILKS PARK			
Elements	Stage	Urban Design Value Judgement	Economic Value Judgement
Fencing for protected areas	1	1	1
Access road	1	1	1
Access road barriers	1	1	1
Car parking	1	1	1
Ecological rehabilitation of 4WD tracks	1	1	2
Picnic areas	1	1	2
Access road lighting	1	2	1
Shareway	2	1	1
Pedestrian trails	2	1	1
Information signage	2	2	2
Pedestrian / cycle signage	2	2	2
Pedestrian trail boardwalks	2	2	3
Facility block upgrade	2	2	2
Recreation vehicle parking	2	2	1
Self contained travellers facility	2	3	2
Planting for ephemeral wetlands	2	3	3
Tree planting	3	1	1
New mown grass	3	1	1
Bird hides	3	2	3
Access way from levee to launching site	3	3	3
Marked parking to Wall Street	3	3	3
Dry grass to Wall Street reserve edge	3	3	3
Timber deck/view areas x 2	3	3	3
Small craft launching site / ramp	3	3	4
Isolated camp sites with fire places	3	3	4
Dog agility park	3	3	4
Playground	3	3	4
Pedestrian trail boardwalks	4	2	3



HAMPODEN TERRACES			
Elements	Stage	Urban Design Value Judgement	Economic Value Judgement
Bridge restoration	1	1	1
Path to Cadell Lane	1	1	1
Levee panel inserts between Crampton & Kincaid Sts.	1	1	1
Relocation of power pole at Kincaid St.	1	1	1
Bridge lighting and feature lighting	1	1	1
Bridge storage facilities	1	2	2
Plaza at Kincaid St.	2	1	1
River bank stabilisation-new slope,terraces	2	1	1
Raising Cadell Lane	2	1	2
Levee gate at Kincaid St.	2	1	2
Stormwater management- aeration/rock cascades	2	4	4
Kiosk	2	4	4
Plaza at Sturt/Cadell Sts.	3	1	1
River bank revegetation	3	1	1
Kiosk at Kincaid St.	3	2	3
Bridge Restaurant	3	2	3
Levee gate at Sturt St.	3	3	3
Kiosk at Sturt/Cadell Sts.	4	1	3
Wetland filters	4	4	4

THE BEND			
Elements	Stage	Urban Design Value Judgement	Economic Value Judgement
General			
Trails	1	1	1
Filling for new landforms	1	1	1
Levee walk	1	2	1
Dedicated cycleway	1	2	1
Stormwater management- aeration/rock cascades	1	5	
Wetland filters	1	5	
Swales, rock mulch	1	5	
Information signage and public art	3	4	3
Associated tree plantings with water element	5	5	5
The Beach			
Realignment of levee at mixed-use/hotel	1	1	1
Filling for new landforms	1	1	1
Removal of asphalt/recycling it	1	1	1
Realignment of beach car access-partial new road	1	1	1
Decommissioning of band shelter	1	1	2
Renovation of existing toilet facilities	2	1	2
Regeneration of beach area-grassing/terraces	2	2	2
BBQ facilities	2	2	2
Canoe shed upgrade	2	3	2
Relocation of caravan park to Wiradjuri Reserve	3	3	3
Mixed-use/residential/hotel facility	3	1	3
Major playground upgrade	3	2	3
Kiosk and deck area at beach	5	3	4
Rotunda	5	3	5
Picnic shelters	5	4	2
Church Hill			
Filling for new landforms	1	1	1
Realignment of levee at church hill	1	1	1
Streetscape enhancement Church Street	1	1	1
Streetscape enhancement Cross Street	1	1	1
Plaza space at church hill	1	1	1
Developments at church hill	4	2	5
Major Community Facility / Tarcutta Street			
Removal of asphalt / recycling it	1	1	1
Realignment of levee at Major Community Facility	1	1	1
Rehabilitation of car-park / contaminated soils	1	1	1
Plaza space at Major Community Facility	2	1	2
Streetscape enhancement along Tarcutta St	2	1	2
Major Community Facility complex	2	1	2
Revegetation of banks at Major Community Facility	2	2	2
Decommissioning existing Playhouse	3	1	3
Development at Tarcutta and Cross Sts.	3	5	4
Multi-storey car-park at O'Reilly St.	4	5	4
Regeneration of Tony Ireland Reserve	5	2	3
Water elements on both sides of Tarcutta St.at Tony Ireland Park	5	5	5



Private Development Facilitation

The redevelopment of vacant and under-utilised land within Riverside to deliver mixed use precincts is vital to the success of the Masterplan. Although public sector development will play a critical role substantial new development will be undertaken by the private sector. Therefore, it is critical to encourage and support appropriate private sector development.

There are a number of potential barriers or challenges to overcome including:

- the difficulties in land assembly;
- the potential risks and costs involved relating to environmental remediation;
- resistance/lack of enthusiasm for redevelopment of existing landowners;
- the increased cost implications associated with 'brownfield' development; and
- the issues associated with addressing parking demands.

The preparation of appropriate tools within the planning scheme can play an important role in supporting appropriate new development. In addition, there are a number of more proactive ways in which private development can be facilitated. These can include amongst others:

Utilising Public Land for:

- land assembly and market testing – packaging public sites for offer to the development market;
- undertaking commercially viable demonstration projects; and
- offering public subsidy for non commercial projects that could act as a catalyst for new development.

Actively promoting appropriate development through:

- actively seeking developers with proven track record in delivering mixed use development;
- offering technical assistance to landowners/developers in 'brownfield' locations;
- maintaining a database of successful projects and developments; and
- conducting accurate and up-to-date market assessments.

Providing incentives to encourage higher-density mixed-use development within Riverside. Such incentives may include rate breaks, planning application fee waivers or parking requirement waivers/reductions.

Action Table 2 - Private Development Facilitation

	Action	Typical Implementing Body	Stakeholder
Action 1	Determine appropriate incentives - such as reduced parking rates – to encourage the redevelopment of appropriate sites within the precinct.	WWCC	LPMA, Property owners and occupiers
Action 2	'Package' sites in preparation for offer to the development market.	WWCC	
Action 3	Facilitate joint venture arrangements between Landcom and private developers to provide demonstration projects. Landcom's involvement could range from: ▪ Providing advice; ▪ Undertaking a commercially viable demonstration project; ▪ Becoming an equity partner in commercially viable development project.	WWCC	Landcom (potentially)
Action 4	Promote a vision for the Riverside as established in the Master Plan through discussion with the owners of key properties, and provide assistance with any potential relocation to more appropriate locations.	WWCC	LPMA, Property owners and occupiers
Action 5	Develop design and planning controls within the Wagga Wagga Planning Scheme to facilitate the development of land between Fitzmaurice Street and Cadell Place.	WWCC	NSW Department of Planning
Action 6	Investigate potential temporary uses for vacant retail properties along Fitzmaurice Street.	WWCC	Property owners and occupiers.
Action 7	Give high priority to addressing parking issues associated with the development of Riverside.	WWCC	WWCC, LPMA Property owners and occupiers



Public Development

State and local government can play an important role in locating public sector developments within Riverside. These include government offices, civic and community facilities, education, health facilities and public housing. Public sector development has the potential to act as a 'catalyst' projects to encourage additional private sector development.

As a result of public responses, it is important that Council give a high priority to addressing the parking issues associated with the development of public developments within Riverside.

The vitality of Riverside can be greatly influenced by the presence of non-commercial, civic and community related land uses. The following table draws together the actions required to ensure the public sector develops new facilities in appropriate locations.

Action Table 3 - Public Development

	Actions	Typical Implementing Body	Stakeholder
Action 1	Ensure appropriate Council and State Government developments are located within the precinct.	WWCC, LPMA and NSW Department of Planning	WWCC, LPMA and NSW Department of Planning
Action 2	Establish through the Riverside Management system a public sector planning and development protocol to ensure liaison with public agencies to ensure that all appropriate public sector office, health and education investments are located, where possible, within the Precinct.	WWCC	All government agencies
Action 3	Give high priority to addressing parking issues associated with the development of Riverside.	WWCC	WWCC, LPMA

Public Transport Improvements

The provision of high quality public transport infrastructure is important for the success of the Master Plan. The provision of frequent services, comprehensive public transport information and effective promotion of these services will help compliment the improvements to pedestrian and cycle amenity in actively encouraging alternatives to private car use.

High quality public transport infrastructure and facilities:

- encourage more people to use them thus reducing car dependency and use;
- increase the accessibility of the precincts to a broader range of community; and
- contribute to the attraction of prospective businesses and residents to the precinct.

Action Table 4 - Public Transport

	Action	Typical Implementing Body	Stakeholder
Action 1	Work with the Department of Transport and Infrastructure and local bus operators to improve bus services including routes and timetabling.	WWCC and Department of Transport and Infrastructure	Local bus operators
Action 2	Improve facilities at bus stops including shelters, seating and service information.	WWCC and local bus operators	



Riverside Management

The actions contained within this section, Making Riverside a Reality, have primarily related to the physical aspects of development. However, to enable Riverside to operate effectively, it is important to consider the management, governance and co-ordination of the area.

The coordinated management, marketing and operation of Riverside is just as important as the physical appearance. Whilst the attractiveness and safety of a place will attract potential users and residents they are unlikely to revisit if the right activities are not available, in the right place and are not advertised or promoted in the right fashion.

A Riverside Management System will rely on the existence of a succinct business plan for the precinct that establishes:

- the preferred role and function of the precinct;
- the relationship of Riverside Wagga Wagga to its environs and the city centre;
- its catchment and target markets;
- the human and financial resources required to fulfil the desired vision;
- the roles and responsibilities of all parties in achieving the desired vision;
- an equitable partnership between the Council, property owners and businesses and other interested stakeholders;
- a marketing and promotional scheme;
- effective communicative system; and
- a comprehensive monitoring scheme that establishes a series of performance criteria by which the health, vitality and viability of the precinct can be assessed.

Action Table 5 - Riverside Management

	Action	Typical Implementing Body	Stakeholder
Action 1	Undertake a marketing and promotion campaign for Riverside as set out in the Strategic Master Plan to prospective businesses, residents, visitors and developers and investors.	WWCC and LPMA	Key property owners.
Action 2	Prepare an Investment Attraction Strategy.	WWCC and LPMA	Key property owners.
Action 3	Establish a Riverside Management System that draws together: ▪ Marketing and promotion of the precinct; ▪ Activity Attraction and retention; ▪ Business development and training; and ▪ Monitoring of the Precinct's health.	WWCC	LPMA
Action 4	Monitor car parking utilisation to identify opportunities for more efficient car park usage.	WWCC	

