

# WESTERN SYDNEY REGIONAL MASTERPLAN

## Project description

The project involves developing Sydney Water's first regional servicing master plan. The Master Plan:

- Examines different regional-scale servicing concepts and directions to better understand the role water plays to support the NSW Government's vision for the Western Parkland City;
- Presents the opportunity of managing the whole water cycle to deliver more sustainable, resilient and liveable urban outcomes; and develop economically viable proposition/s for servicing the region that work towards realising the aspirations of Sydney Water, its customers and its stakeholders; and
- Delivers strategic guidance and feedback into downstream service planning projects for growth areas and developments in the Western Sydney region. It also informs discussions with external stakeholders on potential servicing offerings.

The Master Plan was divided into a number of stages:

1. Issues and Directions
2. Concept Development
3. Adaptive Servicing Pathway Development
4. Economic Assessment
5. Preferred Pathway.

The initial Issues and Directions stage (1) sought to understand the servicing context in Western Sydney and provided a comprehensive outline of the planning challenges; documentation of key regional issues, and directions for the future. It also proposed nine alternative servicing concepts that could address the servicing challenge in Western Sydney by various degrees. This stage reinforced the importance of linking water servicing with liveability and amenity and defined the vision for the master plan.

The Concept Development stage (2) focused on developing each of the alternative servicing concepts. These servicing concepts are not complete regional servicing options but 'building blocks' to be used in developing adaptive pathways in the subsequent preferred or primary pathway. These concepts were studied to establish high level investment costs and economic benefits.

Stage 2 also sought to establish a 'baseline' level servicing approach based on Sydney Water's current servicing plans for Western Sydney's major growth areas. This served as a reference point to test the effectiveness of each of the alternative servicing concepts.

The Preferred Pathway stage (5), focused on developing a preferred long-term integrated water management servicing plan for Western Sydney. This stage followed combining the alternative servicing concepts into a series of adaptable servicing pathways (3) and an economic assessment comparing the costs and benefits of each pathway (4).



Image: Western Parkland City. Source: Sydney Water.

## Project drivers

The work of the Greater Sydney Commission has provided a strong driver for a different desired outcome for development in Western Sydney. Their Vision for a Western Parkland City includes<sup>1</sup>:

- Neighbourhoods with fine grain fabric and human scale that support healthy lifestyles and connected communities;
- Development along the spine of South Creek and its tributaries to re-imagine liveability and sustainability, providing new cool and green neighbourhoods and centres with generous open space in a parkland setting; and
- Increased tree canopy cover to provide shade and shelter for walkable neighbourhoods within easy reach of shops and services.

### THE VISION

Sydney Water's vision is to create a better life with world-class water services. Thus the Master Plan's ultimate aim is to maximise the value to Sydney Water's customers by securing the long term vision and benefits of the emerging Western Parkland City. The specific goal of the Master Plan is that 'Our customers enjoy affordable and essential water services, healthy waterways and vibrant, cool and green places.'

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<sup>1</sup> <https://www.greater.sydney/metropolis-of-three-cities/vision-of-metropolis-of-three-cities/western-parkland-city-vision>

## THE PROBLEM

Problems and challenges in Western Sydney include:

**Population growth** – By 2056 Western Sydney’s population is forecast to double reaching a total of 1.5 million people.

**Climate** – Western Sydney is a hot, and dry place. In 2018, Sydney’s west experienced 46 days over 35 degrees. Even hotter and drier conditions are expected in coming decades.

**Cost of new services** – Much of the growth area is currently rural with limited or no existing water or wastewater infrastructure which can be leveraged for new urban growth. Significant capital investment would be needed to deliver essential services.

**Waterway health** – Growth will occur almost wholly within the South Creek catchment, a tributary of the Hawkesbury-Nepean River. Increasing volumes of wastewater and stormwater will need to be carefully managed as the city’s urban footprint expands.

**Unprecedented infrastructure investment** – Sydney’s new international airport at Badgerys Creek and other catalytic infrastructure will unlock significant business and employment opportunities.

**Place making imperative** – About 80 km west of Sydney’s beaches, South Creek also represents the primary landscape feature for new communities. This offers an opportunity to co-create a significant ‘green and blue’ corridor with government agencies, local councils, developers, and communities.

These problems also present as opportunities to think differently about water servicing for this emerging City.

## Stakeholder and community engagement

Engagement with government stakeholders was central to the Master Plan’s development from the outset. Stakeholders from about 30 Australian and NSW Government agencies, and Western Sydney local councils were involved in workshops to help Sydney Water shape the Master Plan at key stages. The stakeholders broadly ranged from planning, infrastructure, environment, resource and land management and development sectors.

Each stage acted as an opportunity to engage key stakeholders and confirm the plan’s direction. The Master Plan’s goal (see above) was developed in collaboration with stakeholders.

## Outcomes sought

The development of the Master Plan aimed to:

- Develop, test and evaluate a set of regional servicing concepts under alternative future growth and consumption scenarios;
- Consider customer, community and stakeholder needs to understand values, and preferences;

- Develop an evidence base of costs, benefits and risks of different regional servicing approaches for discussion with planning partners, regulators and shareholders; and
- Advance organisational capacity to be future focused and conceptualise solutions that are aligned with Sydney Water’s corporate vision.

In terms of the IWM Outcomes presented in IWM Principles and Best Practice for Water Utilities, these aims relate to the following outcomes:

- **Outcome 1a** – Connection with water and water literacy
- **Outcome 2a** – Collective leadership, long-term vision and commitment
- **Outcome 3b** – Cross-institutional arrangements and processes
- **Outcome 3d** – Economic and financial/funding systems
- **Outcome 6d** – Equitable access to amenity values of water-related systems
- **Outcome 7a** – Highly efficient use of all sources of water.



Images: Western Sydney Adaptive Pathways Workshop and final stakeholder briefing. Source: Sydney Water.

## Options assessed

Using the concepts as building blocks, four alternative servicing pathways were developed to reflect different levels of water integration in the region inspired by the Urban Water Transitions Framework<sup>2</sup>.

The land uses in the catchment, including potential future urban typologies, were investigated in collaboration with the Greater Sydney Commission and Infrastructure NSW as part of parallel work being conducted for the South Creek sector review.

### Pathway 1 – the Western Drained City

This represents what could be considered the baseline servicing approach for the region. It relies on:

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<sup>2</sup> Brown RR, Keath N, and Wong THF, 2009. Urban water management in cities: historical, current and future regimes. *Water Science Technology* 59 (5): 847-855.

- Existing water supply sources for drinking water;
- Minimal recycling (limited to existing commitments);
- Discharge of treated wastewater, either into existing systems or into local waterways;
- Limited irrigation demands would be met with drinking water; and
- Stormwater management remains decentralised and managed separately by relevant local councils.

### **Pathway 2 – the Western Water Cycle City**

This promotes a higher level of recycled water for non-drinking consumption in the region to satisfy increased cooling, irrigation and agricultural demands. It relies on:

- Irrigation of open spaces as it is proposed the Western Parkland City would increase the amount of public recreational spaces
- Residential land use shift towards medium density multi dwellings, a common feature of pathways 2 to 4
- Greater extent of recycled water would reduce reliance on existing drinking water supplies
- Recycled water generated in cooler months would be stored, and storages established and spread throughout the region
- Water storages to function as blue spaces to cool the region in warmer months, and potentially play a role in recreational use
- A shift to centralise stormwater management with a focus on reuse by mean other than rainwater tanks at a property level.

### **Pathway 3 – the Western Water Centric City**

This considers discrete integrated water servicing through the region with greater reliance on decentralised servicing. This pathway:

- Enables servicing out of sequence growth and also provides an opportunity for tailored servicing of development at a precinct level.
- In the short term, there might be increased irrigation demands supplied from package plants.
- Future greenfield developments could take on a much more integrated vision with purified recycled water for drinking featuring more prominently in servicing.
- Similar to Pathway 2, stormwater management is centralised, however rainwater tanks at a property level are included.

### **Pathway 4 – the Western Water Resilient City**

This considers the role of centralised wastewater servicing with purified recycled water via surface water or groundwater augmentation. With recycled water sourced from highly treated wastewater and stormwater. This could have several benefits to the region, including:

- The ability to increase the resilience of the city's drinking water supply and reducing the discharge impacts on local waterways.
- As it currently stands, purified recycled water for drinking may not be considered acceptable by Sydney Water's customers, which makes implementation of such an option challenging at present.

## Discussion

Unprecedented investment in Western Sydney is driving an exciting transformation centred on Greater Sydney's new second international airport, driving economic and housing growth, and is coupled with the NSW Government's vision of a new Western Parkland City.

In parallel, the master plan goes beyond essential water services to consider, integrate, and understand the economic value of water in all its forms for shaping, building, greening and cooling a new Parkland City.

Examining a series of regional-scale servicing concepts and four alternative servicing pathways the master plan finds that an adaptable and integrated water cycle management approach to deliver the Parkland city vision delivers the greatest economic value, over a conventional servicing approach.

## Evaluation and financing

Following a financial costing, an economic analysis of the four servicing pathways was conducted to establish net present costs and benefits. This work determined the best value servicing pathway and determine a preferred adaptive pathway over the long term.

Pathway 2, the Water Cycle City, was chosen as the primary, or preferred, pathway as it delivers the greatest economic value to the region at the least cost to realise the Parkland City vision. Pathway 2 is also the most readily deliverable in the current regulatory and socio-economic setting.

However, Pathways 3 and 4, for a Water Centric City and a Water Resilient City respectively, are also favourable as they deliver greater economic value than Pathway 1, the Drained City. Indeed the Drained City pathway, does not meet the Parkland City vision, and costs marginally less than an integrated water pathway (less than 10 per cent).

The incremental cost of servicing the Parkland City vision (\$2 billion) also brings substantial economic benefit (additional \$10 billion) due to improved liveability and amenity outcomes.

The Master Plan sets a new direction for water servicing. An adaptive serving plan was built and key decision points highlighted over time to illustrate the servicing path potentially moving across the pathways depending on opportunities or issues at those critical points. The master plan also identifies nine strategic servicing outcomes and an action plan to shape implementation.

The Master Plan took an agnostic view of water servicing providers in Western Sydney, including services beyond Sydney Water's current role and responsibility in Western Sydney

to ensure the whole urban water cycle was considered (e.g. stormwater management). Later more detailed planning stages and projects would consider responsibilities and funding aspects.

## Reflections and lessons learned

- a. There will be more than enough water to support Western Sydney as the emerging Parkland City provided water is valued, managed and funded appropriately. A more integrated, water sensitive pathway would mean more than enough water for the Parkland City in 2056 and flows to rivers and creeks significantly reduced.
- b. To deliver high-value outcomes for the Parkland City, management, ownership and funding of stormwater services across the South Creek catchment will require coordination between government agencies to deliver consistent outcomes.
- c. Although each servicing pathway was individually developed as a discrete servicing plan for the region, no single pathway provides a viable servicing option for the region beyond today. Rather each pathway plays or may play a significant role at some point in time over the next 40 years. An adaptive path is therefore called for.
- d. Revaluing the vast volumes of stormwater and wastewater to be generated ensures water is put to its best use and supports community-wide outcomes.
- e. Land use urban typologies play a major part in soil permeability and retention of water in the landscape.
- f. There is great value in starting evidence-based conversations about the value of water services and its broader benefits with stakeholders and ultimately, customers.