

SOUTHBANK: A MASTER PLAN FOR INTEGRATED WATER MANAGEMENT

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INTRODUCTION

Melbourne's Southbank Precinct includes development of significant cultural, heritage and civic value, particularly along its Yarra River frontage and St Kilda Road boundary. Adjacent to the CBD, Southbank also incorporates commercial office space, as well as a medium to high-density residential population of approximately 10,500. The City of Melbourne (CoM) produced the *Southbank Structure Plan 2010* to establish a vision and strategy for the future development of Southbank (CoM, 2010), seeking to integrate the precinct with the central city and achieve a sustainable and liveable precinct. The Structure Plan projects more than a seven-fold increase in residential population, which will place increasing pressure on water resources, infrastructure and the local environment, but also presents an opportunity to implement sustainable practices that help achieve the Plan's vision.

Developing a conceptual master plan for integrated water management (IWM) in the precinct will enable a comparison with a business-as-usual approach. The multiple IWM concepts proposed present a paradigm shift in the way water services are provided to cater for growth. An evaluation of the economic, social and environmental implications will help to inform sustainable decision making in water infrastructure provision, not only in Southbank, but for cities of the future.

This paper will explore the results of the comparison between conventional and IWM approaches to servicing future growth in Southbank. It will also highlight the major risks and challenges, as well as identifying the policy and regulatory instruments that could help drive change. The findings will contribute to evolving industry focus aligning with programs such as the IWA's *Cities of the Future*.

METHODOLOGY

This work builds upon the *Southbank Sustainable Utilities Study* (AECOM, 2009) and *Southbank Integrated Water Options Review* (AECOM, 2010) that helped to inform the Southbank Structure Plan. The latter includes a range of sustainable infrastructure concepts that have been refined into a 'Sustainable Strategy' for analysis:

- Sewer mining, to produce recycled water, to be used throughout the precinct for non-potable uses, as well irrigation in parks and gardens in adjacent precincts
- Stormwater harvesting through an 'intelligent network' of distributed storages that also act to mitigate minor nuisance flooding
- Advanced treatment of stormwater, to be reticulated throughout the precinct for hot water use
- Precinct-wide Water Sensitive Urban Design (WSUD) and green roofs on new buildings
- Vacuum sewers to convey future wastewater loads.

A key feature of the Plan was the inclusion of tri-generation, which would be co-located with the treatment plants at a Central Services Hub. In addition to electricity, tri-generation would provide a

source of reticulated heated and chilled water, to be used for district heating and cooling. To accommodate the increased number of new pipeline networks, a Combined Services Tunnel is also proposed to enable ongoing access for the installation and maintenance of existing and future utilities.

A key challenge in implementing precinct-wide IWM is a preparedness to commit to the required infrastructure at the earliest stage of development, so improving economies of scale. As the local retail water authority, South East Water (SEW) are keen to establish the viability of the concepts proposed in order to inform their submission to regulators for the forthcoming Water Plan period. A Working Group was formed with SEW, Melbourne Water (MW), the CoM and the City of Port Phillip (CoPP), who want to apply the findings in areas adjacent to Southbank, including the South Melbourne Industrial, St Kilda Road and Fisherman's Bend precincts. AECOM were commissioned to develop and evaluate the conventional (business-as-usual) and sustainable servicing strategies, which required concept designs developed in sufficient detail to inform cost estimates.

A key benefit of the Sustainable Strategy is the potential to defer major transfer network and supply augmentations into the future. Network modelling is being undertaken to determine the future upgrade requirements for MW's systems under each scenario, informing the financial assessment by incorporating MW's long-run marginal costs (LRMC) for water and wastewater. An economic assessment will also consider quantifiable externalities (such as reducing nutrients discharged to Port Phillip Bay), and be complemented by a qualitative multi-criteria assessment.

To better inform cost estimation and the evaluation process, a thorough risk identification process was included to help refine key risks and challenges from planning, construction, operational, regulatory, social and environmental perspectives. The various elements to the strategy required multi-disciplinary input and stakeholder engagement to address the breadth of the technical and financial implications.

RESULTS/OUTCOMES

The options analysis will help to inform the viability of pursuing an alternative, sustainable (IWM) servicing strategy to cater for growth in an inner-city suburb that is projected to undergo significant densification. The results of the economic assessment will also have implications for the cost of achieving eco-city targets, many of which are unlikely to be reached without implementation of the IWM concepts proposed. The economic assessment aims to identify the costs to individual stakeholders, including councils, utilities and developers. Extrapolation of the results to adjacent precincts will also help to inform, at a high level, the viability of the components of the sustainable servicing strategy when considering future infrastructure options in other areas.

CONCLUSIONS

Melbourne's Southbank Precinct is representative of urban redevelopment opportunities in many cities, where future densification will place increasing strain on existing resources and infrastructure. This paper will discuss in more detail the development of concept designs for conventional and sustainable infrastructure servicing alternatives, and the results from the options analysis and evaluation. The figures below indicate the extent of the precinct and its Melbourne context.

Figure 1 – Southbank and adjacent precincts

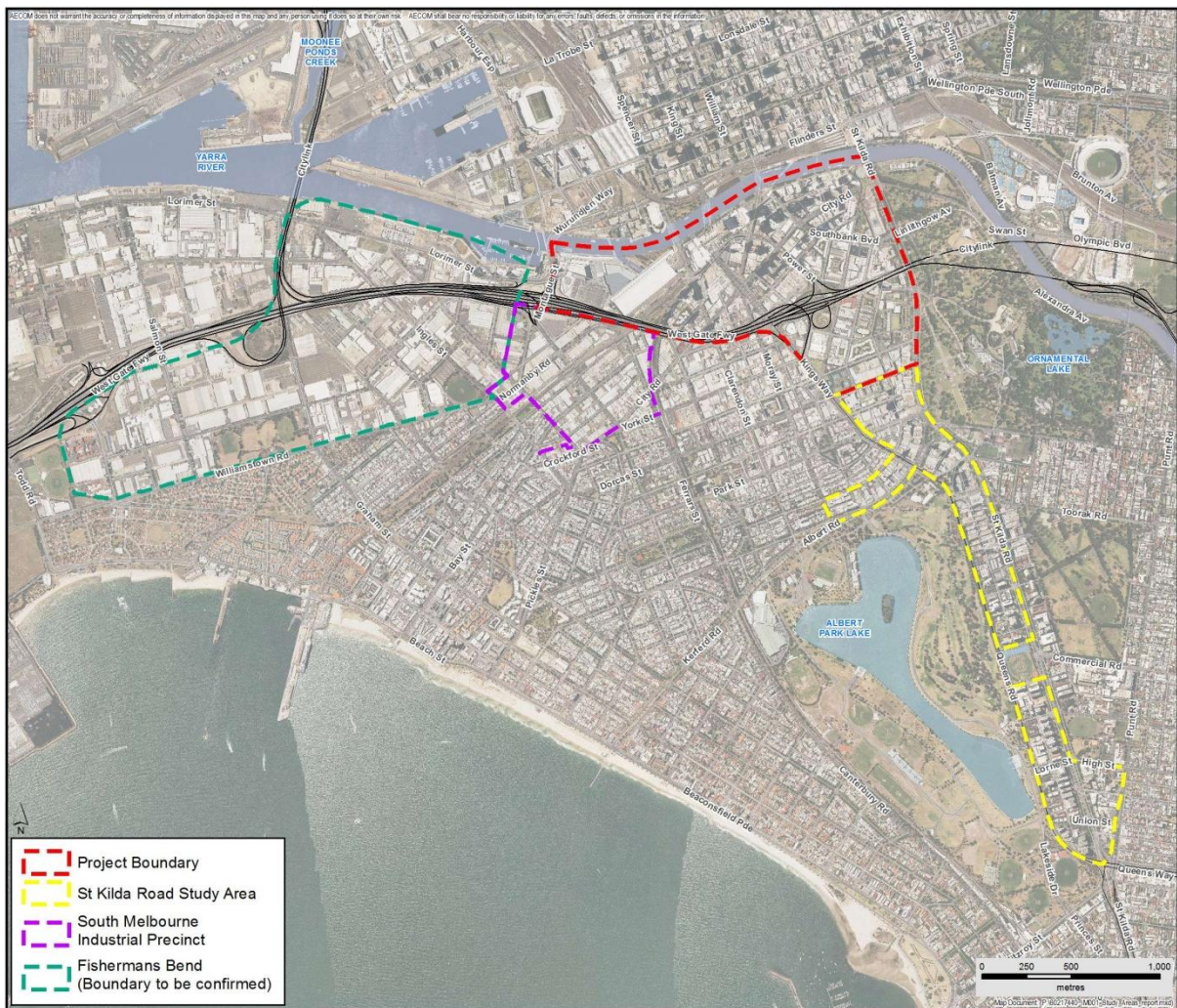


Figure 2 – Projected development in Southbank and conceptual sustainable strategy elements

