



Assessment of nonmarket benefits of WSUD for a residential development: a case study

Project IRP2

The CRCWSC has developed and tested benefit transfer methods to generate a reasonable approximation of the dollar value of several nonmarket benefits associated with a proposed water sensitive urban design (WSUD) investment in a residential development.

Introduction

Water sensitive urban design (WSUD) is an approach for planning and designing urban environments that are sensitive to water sustainability, resilience, and environmental protection. Elements of WSUD investments, such as constructed wetlands and living streams, could provide many intangible benefits, for instance aesthetic, recreation and ecological improvements. These benefits are often not considered when making investment decisions due to a lack of monetised values for these services. Time and resource constraints limit decision makers' ability to conduct original nonmarket valuation studies to obtain values. In these instances, benefit transfer methods are useful to extrapolate (transfer) existing nonmarket values to a new context or location, providing a reasonable approximation of the dollar value of nonmarket benefits associated with the investment.

The CRCWSC carried out an extensive review of existing Australian studies that have published nonmarket value estimates of the intangible benefits of water sensitive systems and practices. The information has been compiled into the INFFEWS (Investment Framework for Economics of Water Sensitive Cities) Value Tool, which currently contains more than 2,000 nonmarket and market values. An associated set of guidelines explains how to use the tool and conduct benefit transfer.

Read the [Guidelines](#) for the broader application of this tool.

To test the tool and the guidelines in a case study, the CRCWSC assessed the nonmarket benefits derived from WSUD technologies, including a constructed wetland and a living stream, on a residential development site in Western Australia.

Belle View Case Study

Belle View Estate is a proposed 44 ha residential development located in Bellevue suburb, 16.5 km north-east of Perth, WA. The site (see Figure 1) is transacted by a City of Swan owned drainage reserve known as Bellevue Drain. The IRP2 team worked with the private developer (Strategic Planning Institute P/L), Eastern Metropolitan Regional Council, Department of Biodiversity, Conservation and Attractions, Department of Water and Environmental Regulation and others on this case study.



Figure 1: The overview of the study

Methodology

In the first instance, the relevant set of benefits were identified in consultation with the case study partners. Amenity and pollution removal benefits were identified as the two most prominent benefits likely to be generated from the WSUD technologies on the site. Then, the team reviewed information contained in the INFFEWS Value Tool and other literature to obtain a suitable set of primary nonmarket valuation studies. Standard benefit transfer methods were applied to transfer (adjust) existing estimates to the application site. The team assumed the amenity benefits of constructed wetlands and the living stream are likely to be capitalised by homes within 500 m and 50 m of the site respectively.

The living stream also has the capacity to remove pollutants (primarily, total nitrogen and total phosphorous) which benefits local waterways. The pollution removal benefit was estimated using a standard urban nutrient runoff model.

Finally, the aggregate nonmarket values of the WSUD technologies were estimated under different levels of benefit assumptions (Figure 2).

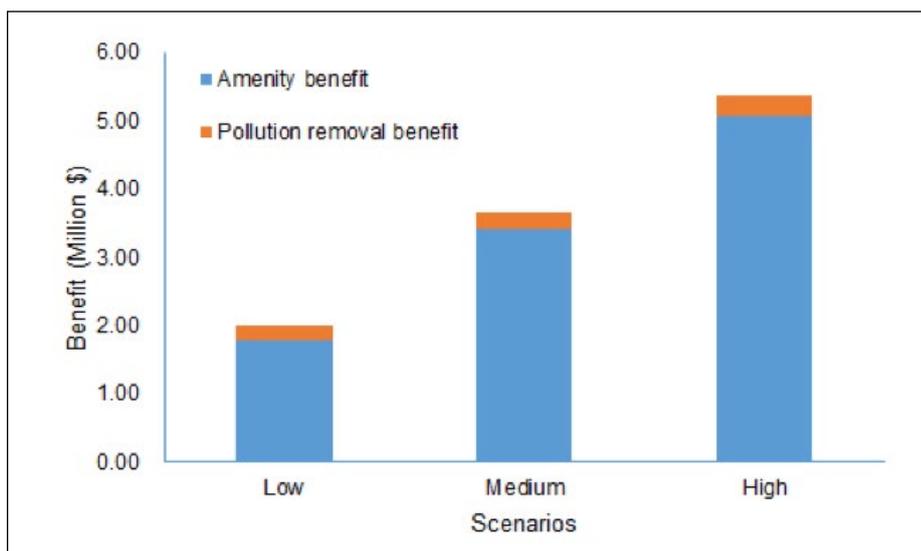


Figure 2: Nonmarket benefits of WSUD in Belle View Case Study

Results

The benefit of WSUD implementation is substantial. The aggregate value ranges from \$2.0M to \$5.4M (AU\$ million). The total **amenity value** generated by WSUD is estimated between \$1.8M and \$5.0M. The total **pollution removal benefit** is about 7% of the aggregate value. However, these estimates are conservative. For example, the pollution removal benefit estimations do not include the downstream environmental benefits and the additional "savings" of money that may need to be spent to manage unremoved nutrients.

The residents in the proposed development will enjoy most of the benefits (84%) from the project. This value will be captured in house prices. The residents and the wider community will also reap amenity and pollution removal benefits (16%) from the project (see full report for analysis details).

If the residential development containing these WSUD technologies is economically justifiable for the investor, then it would be beneficial to consider the long-term governance arrangement for the continuous management of these systems.

Further reading

Iftekhar, M. S. and Polyakov, M. (2019). [Assessment of nonmarket benefits of WSUD in a residential development: Belle View case study](#). IRP2 Comprehensive Economic Evaluation Framework (2017 – 2019). Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities.

Further information



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<https://watersensitivecities.org.au/content/project-irp2/>



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