

Integrated Research Project 4 — Water sensitive outcomes for infill developments

The aim of the project is to influence more water sensitive infill development in our cities. 'Infill development' is development that occurs within existing urban areas, mostly through densification. The project will generate evidence-based guidance on housing design alternatives that can mitigate the adverse impacts of poorly planned infill development, related to increased stormwater runoff and urban heat, while improving amenity and liveability.

Project synthesis

Most major Australian cities expect significant infill development over the coming decades. But without significant intervention, 'business as usual' development is expected to seriously undermine the hydrology, resource efficiency, liveability and amenity of our cities. IPR4 leads the way in tackling this problem, by developing industry focused tools to assess these impacts for infill developments, and the benefits of more water sensitive designs. The outcome will be design alternatives that combine quality/visionary architectural design with good water performance.

What we will deliver

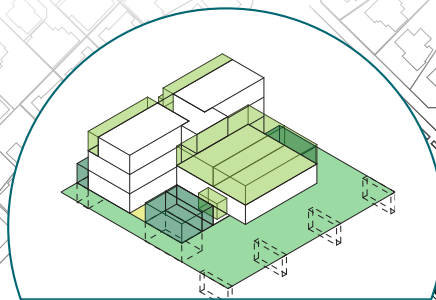
IPR4 project outputs will be:

- An infill development evaluation framework that compiles quantitative and qualitative indicators of performance, to help decision makers assess the impact of planned infill developments.
- A water mass balance tool to generate the quantitative water performance indicators used in the evaluation framework.
- A catalogue of water sensitive design options for different scales of infill development.
- Improved governance arrangements that can help operationalise optimal design outcomes.

These outputs will draw heavily from real world case studies, which will act as experimental test beds. Plus, the project Steering Committee will ensure industry input, via representatives from the sector including Inner West Council, Landcorp, Brisbane City Council, Water Sensitive SA, Flow Systems, among others.



Typical infill development
(business as usual)



One of the future housing typologies
that will be tested to see if
it delivers more water-
sensitive outcomes

Case studies

Three case studies are planned for the project, which were selected in collaboration with industry and local government representatives. They include Adelaide, which is striving for urban sustainability and liveability in an arid climate through effective use of its limited water

resources; Perth, with its ambitious infill targets in a context of groundwater problems and limited rainfall; and Brisbane, with its subtropical climate and flooding risks. The case studies represent a broad spectrum of challenges that water sensitive infill developments aim to address.

Brownfield and greyfield developments

The case studies will focus on brownfield and greyfield developments, which are the most common forms of infill. The latter is a particular challenge, because it is mostly unregulated.

'Missing middle' development scale

The scales of infill development will range from individual lots through to 'precincts'. This focus promotes a shift from the current 'knock down-rebuild' approach, to more planned and water sensitive precincts up to around 5,000 households scale.

Impacts at both local and catchment scale

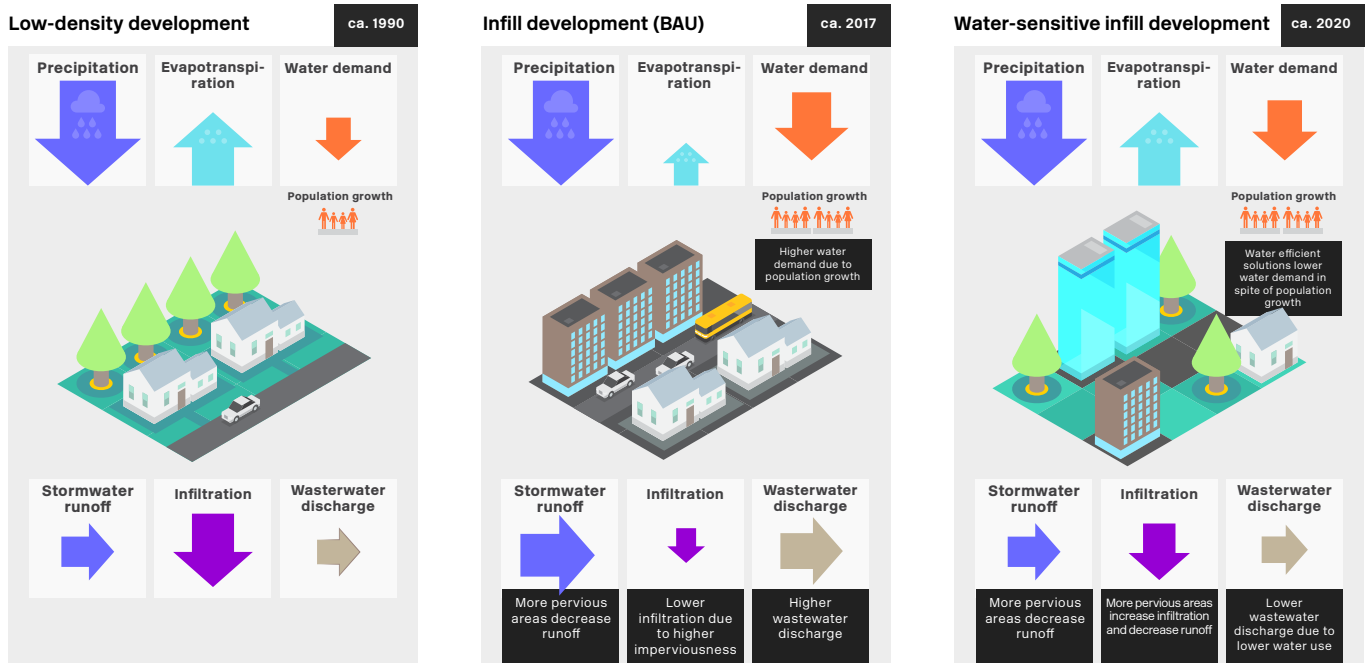
The developed tools will aim to assess the impacts of infill in the context of the local development site, but also the implications for the wider catchment.

Range of water-related impacts

The evaluation framework will aim to capture a range of impacts, which may include water efficiency, natural hydrology, urban heat, water related energy, and amenity.

Influence of infill development on water performance

Urbanisation alters local hydrology and water resources, with knock on effects to the wider environment and liveability. The increased imperviousness from urbanisation leads to higher stormwater runoff (and flood risks), urban heat and decreased groundwater infiltration. Freshwater imported into urban areas from the surrounding environment depletes stock available for other uses. Good urban design can ameliorate these effects, and IPR4 aims to demonstrate how this can occur.



For further information, visit: <https://watersensitivecities.org.au/project-irp4/>

Dr Marguerite Renouf
Deputy project leader
m.renouf@uq.edu.au
07 3346 1228

Beata Sochacka
Project manager/Research assistant
beata.sochacka@crcwsc.com.au
07 3346 1228

Cooperative Research Centre for Water Sensitive Cities



Level 1, 8 Scenic Boulevard
Monash University, Clayton VIC 3800

www.watersensitivecities.org.au



info@crcwsc.org.au



@crcwsc



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