

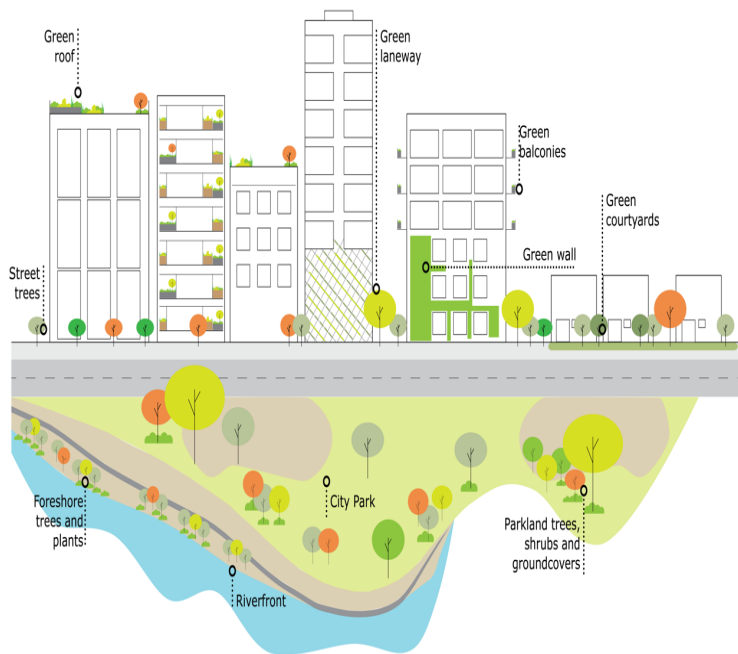


Water sensitive urban design

Urban greening with WSUD

Summary

Urban greening refers to the practice of integrating greenery (native and non-native vegetation) into urban environments. This includes retaining and planting trees, shrubs, climbers and groundcovers in parks, streetscapes, gardens, podia and platforms, roofs, walls and balconies. Integrating these “green” systems with “blue” systems (stormwater and wastewater management, wetlands, waterways and drains) provides opportunities for passive watering and fit-for purpose water use and enhances plant health.



Introduction

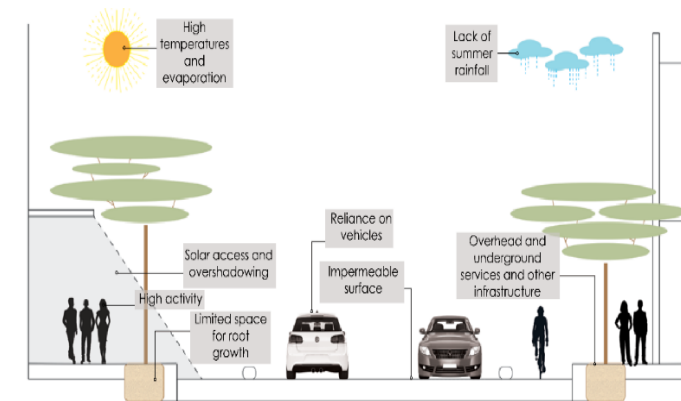
Urban greening helps mitigate the urban heat island effect by providing shade, reducing surface temperatures and reducing air temperatures due to evapotranspiration. Green spaces also absorb pollutants, improve air quality, and support biodiversity by providing habitats for various species. Additionally, urban greening enhances the mental and physical health of residents by creating spaces for relaxation, recreation, social interaction and connecting with nature.

Opportunities

Urban greening can be applied across different spatial scales, ranging from small pot plants and planters on balconies, to ecological corridors along waterways. Opportunities should be sought to create places for plants on lots, buildings, streets, parks and plazas, across both public and private land and infrastructure, and in all land use types. Irrigation needs and water source and supply opportunities will need to be considered.

Street trees are beneficial in selling homes. The presence of trees on the street increases a home’s sales price and reduces its time on the market (Donovan & Butry 2010). An assessment of 5606 single family homes sold in 2009 across 23 suburbs in Perth showed that large verge trees increase property value (+\$17,000)(Pandit et al, 2013).

Challenges



Urban greening faces a number of challenges due to south-west WA’s dry, windy climate and limited summer rainfall. As a result, our urban green infrastructure generally relies on irrigation to maintain healthy levels of growth and “green-ness”. This can put pressure on our available groundwater resources or require additional resources to facilitate access to scheme water. In addition, irrigation needs will increase as temperatures rise. This is already being experienced in locations with high urban heat.

Urban growth and continued demands for housing and development also impact the ability to retain and increase trees and plants due to the many competing needs for space in our urban landscapes. This can be further exacerbated by concerns regarding construction and ongoing maintenance costs.



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Green-blue connections

Enhancing the connection between green and blue infrastructure at all scales will improve outcomes across our urban landscapes. Opportunities include:

- Diverting stormwater from piped drainage to vegetated surface systems. The integration of trees into rain gardens increases evapotranspiration and reduces stormwater runoff (Thom, 2020).
- Vegetating the banks of urban drains, including planting trees, whenever possible.
- Using permeable pavements and/or decking (where hard surfaces are necessary) to allow water to recharge groundwater storages and create soil moisture.

- Installing kerb breaks (or cutting kerbs) adjacent to street trees to provide for passive watering. Irrigation of trees, including passive infiltration with stormwater runoff, can increase canopy cover by up to 80% (Hitchmough, 1994).
- Reusing greywater for lot-scale greening.
- Local treatment and reuse of wastewater for irrigation of public open space.
- Installing roof gardens and planters on podia that manage stormwater runoff.
- Directing downpipes into planter boxes or gardens.
- Ensuring runoff from driveways is directed into garden beds or lawn.
- Selecting local native and waterwise plant species.
- Planting trees and/or shrubs along streets connecting important areas of habitat such as wetlands or bushland.

References

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Urban heat mitigation

Heatwaves are Australia’s deadliest natural hazard.

Heatwaves now arrive earlier, are hotter, and last longer. Many Australian studies suggest that, with the exception of disease epidemics, extreme heat events are the most important natural hazard in Australia in terms of human mortality (Coates et al, 2022). Urban heat mitigation through greening can significantly reduce human heat related morbidity and mortality.

Urban canopy cover helps to keep homes, streets and parklands cool while reducing the mean radiant temperature. As a result, urban canopy substantially reduces the demand for energy use and water consumption (Low Carbon Living, 2017). Air temperature will reduce by 1°C above and within one water body diameter distance downwind of a wetland or waterway (Jacobs et al, 2017). Research confirms that a minimum 30 per cent canopy cover can address urban heat on a local scale (Ziter et al, 2019).