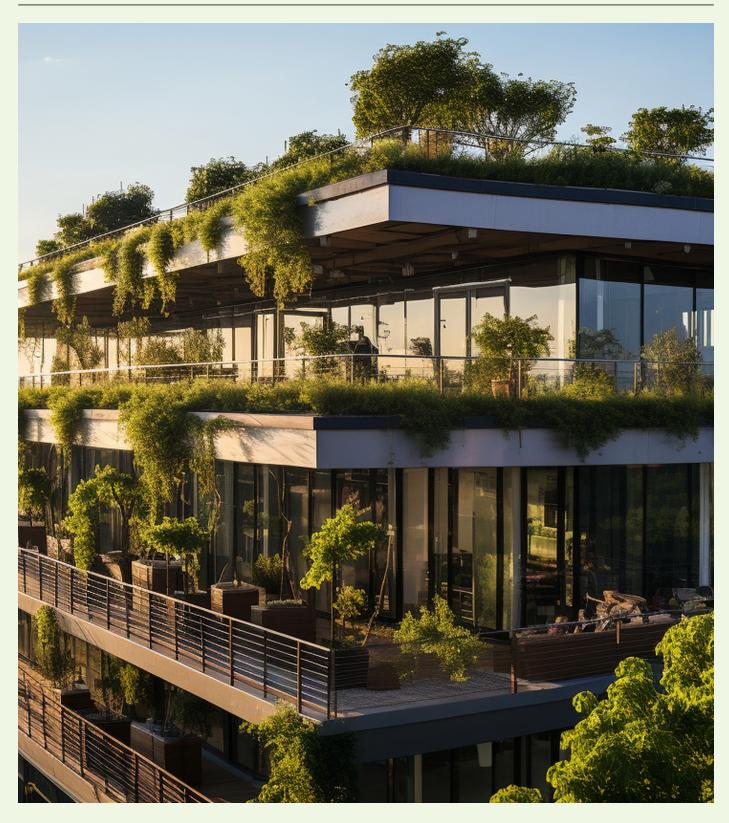
THE LIVING CITY



CONVERSATIONS ON CITY GREENING



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DEFINING CITY GREENING AND ITS VALUE

DEFINING CITY GREENING AND ITS VALUE

City Greening involves the seamless integration and preservation of green spaces, green infrastructure, and nature into our urban environments.

These green spaces include buildings, remnant landscapes often rich in biodiversity, parks, gardens, streetscapes, freeways, carparks, development sites, urban forests, roof tops, green infrastructure in buildings, and the public realm.

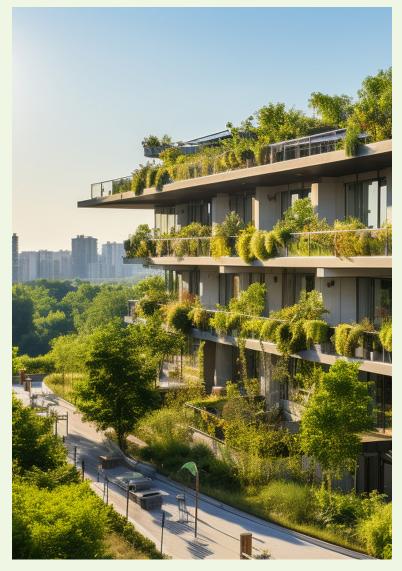
Over half of the world's population is now urbanised. They live in highly dense and compact cities, and often in apartments separated from natural systems, or on small lots with limited site permeability. Far removed from the natural systems and processes on which we depend to sustain us.

THE GREEN REVOLUTION: CITY GREENING EXPLAINED

The transformative journey of City Greening represents a profound shift in how Australian cities interact with their underlying natural systems. This shift underscores a growing recognition that urban landscapes are intrinsically linked to vibrant ecosystems. Cities rich in greenery boast an increased presence of native flora, expansive parks, and broad access to verdant spaces for all residents. Although some Australian cities already exemplify this lush vision, others still lag behind. Driven by a commitment to sculpt better urban and community spaces, we seize the present opportunities to foster a greener future.

Grasping the heritage and swift development of Australian cities offers crucial insights as we envision and craft their future. The pace of urban sprawl has exacted a severe toll on natural landscapes, erasing invaluable ecological knowledge once held by First Nations peoples. This historical context is essential for understanding the depth of transformation required.

Bio-urbanism emerges as a cornerstone for fostering healthy, economically vibrant, and sustainable urban areas. This approach promotes carbon reduction through green decarbonization strategies, enhances resilience against climate change, and cultivates cities that are not only sustainable but also desirable places where communities can flourish amidst nature. This vision propels us toward an urban future where the environment and human well-being are in harmonious alignment.



BIO-URBANISM EMERGES AS A CORNERSTONE FOR FOSTERING HEALTHY, ECONOMICALLY VIBRANT, AND SUSTAINABLE URBAN AREAS.

JULIE SLIFIRSKI Director — Design



ENVIRONMENTAL BENEFITS

Urban heat island mitigation becomes more achievable with City Greening, meaning we can look to reduce temperatures by around 10%. In the same vein, we can see less reliance on infrastructure including air conditioning to moderate temperatures.

Urban forests and greening strategies not only cool cities but encourage communities to walk or cycle as their preferred method of transportation. City greening initiatives such as Water Sensitive Urban Design (WSUD) can reduce impacts on infrastructure and stormwater systems and prevent pollution from entering natural waterways. Green cities can see improved air quality, as vegetation absorbs pollutants and particulate matter.



PUBLIC HEALTH

Greenness is a positive mitigator of disease. There is demonstrated evidence that links low levels of 'greenness' to disease progression, comorbidity, and poorer mental health outcomes. Lower levels of stress and anxiety are associated with having a stronger connection to nature¹, street trees can be linked to greater levels of wellbeing for property residents², and people living in areas with higher levels of tree canopy may be less likely to have some types of costly hospital admissions³.



DECARBONISATION BENEFITS

Through the design and implementation of greening strategies in a precinct or city, local heat reduction measures assist in the reduction of energy use and emissions of the built environment. By reducing the outside ambient temperature through green infrastructure, the energy demand of buildings and infrastructure within a precinct and city can be influenced, reducing the energy demand required for cooling within the building. In cooler climate zones, well designed green roofs and facades also provide important thermal insulation that can lead to lower energy and emissions in winter for heating.

As we continue to model future scenarios with considerations of global temperature increases, city greening provides us with mitigation techniques to assist and support us at a local and city level.

¹ Chang et al, 'A lower connection to nature is related to lower mental health benefits from nature contact', <u>www.nature.com/scientific reports</u>, 2024

² Ordonez et al, 'Having a tree in front of one's home is associated with GREATER subjective wellbeing in adult residents in Melbourne, Australia, and Toronto, Canada', Environmental Research vol. 250, 2024

³ Feng et al, 'Show me the money! Associations between the tree canopy and hospital costs for cardiovascular disease events in a longitudinal cohort study of 110,134 participants', Environment International, Vol 185, 2024



SOCIAL BENEFITS

The Covid pandemic and restrictions on community movement were a catalyst for many to connect with their local environment. Parks were overflowing, streetscapes activated, and many people in their local community forged new connections, often through the setting of green spaces such as parks and streets. This tangible connection to nature and the relief it provided created a big shift in thinking about the value of green and its positive social impact.

The positive benefits of access to green spaces are vast; positive participation in physical activity, improved cognitive function, reduced stress levels, higher productivity, and improved mental and physical health.



CARBON SEQUESTRATION

Our natural environment stores carbon and mitigates greenhouse gas emissions. Stopping land clearing, including in cities, is essential to mitigating climate change. Retention of trees within urban landscapes is essential.

Greening cities plays an enormous role in carbon sequestration, and Eucalyptus trees are excellent for offsetting carbon emissions. Urban forests in carparks also provide important shade, habitat, and amenity and prioritise the 'park' in carparks.



ECONOMIC BENEFITS

Proximity to quality green spaces and incorporation of quality green infrastructure has been associated with increased property values and rental returns. This includes higher demand for urban areas, including apartment buildings, with quality green infrastructure that is well maintained and designed.

Valuation reports vary widely but the direct correlation between quality green investment and building sales and rental yield is compelling. Some research shows that the value of a green building is 2-4% higher than a building that does not incorporate green initiatives. For residential properties it is well established that tree canopy coverage can have a positive impact on property values⁴, with some research has indicating that in Australia large street trees can increase median property value by nearly \$17,000⁵.

⁴ Ewane et al., 'Influence of urban forests on residential property values: A systemic review of remote sensing-based studies', Heliyon, 2023

⁵ Pandit et al., 'The effect of street trees on property value in Perth, Western Australia', Landscape and Urban Planning, Vol. 110, 2013, p.134-142

EMERGING OPPORTUNITIES FOR GREEN INFRASTRUCTURE

Addressing the significant challenges of climate change, population growth, and urban heating, requires an innovative approach to the delivery of green infrastructure. Realising the benefits of green infrastructure through incremental change at all scales will engender more equitable, liveable, and resilient cities for us all to enjoy for generations to come.

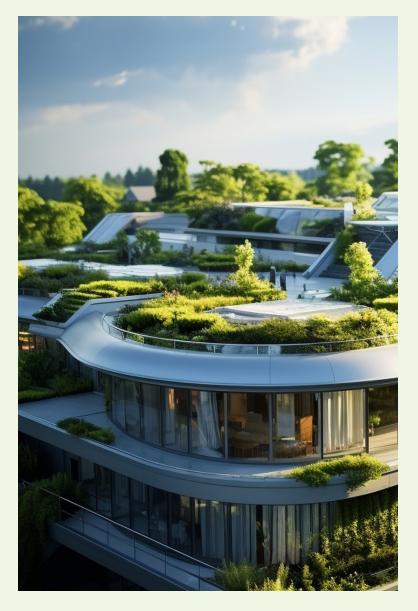
LEVERAGING THE POTENTIAL OF POPS

As our urban centres develop, we're seeing a new typology of open space come to the foreground; Privately Owned Publicly Accessible Space (POPS). This is a model where private developers deliver 'publicly accessible' spaces as part of their project.

The concept of POPS was first created in New York in the early 1960s, where private developers were incentivised to create civic space outside and between the commercial buildings they were developing. The most common types of POPS we see in Australia are plazas, pathway extensions, and urban parks.

Ecological systems don't discern between the binary oppositions of public and private, and no single government agency, private corporation, or professional discipline can deal with this complexity. We can't design our way out of massive uncertainty, but we can advocate, innovate, and legislate to put the environment, and not just people, at the centre of place making⁶.

These spaces have the potential to plug into the network of green spaces and infrastructures across the city by providing critical links in tree canopy, biodiversity corridors, and habitat that we might not otherwise have access to. Their existence offers potential to facilitate movement of species across landscapes as part of a broader network of green streets or green infrastructure.



ECOLOGICAL SYSTEMS DON'T DISCERN BETWEEN THE BINARY OPPOSITIONS OF PUBLIC AND PRIVATE.

BRENTON BEGGS Associate director — Design

⁶ Claire Martin for Foreground, November 2019: <u>www.foreground.com.au/</u> planning-policy/wrong-division-the-rise-of-privately-owned-public-space/



KEEPING OUR CITIES THE LIVEABLE: ADDRESSING URBAN HEAT ISLAND AFFECT & BIODIVERSITY

Our Australian Cities are often recognised as some of the most liveable in the world, but two emerging issues threaten to slowly and insidiously chip away at those accolades. Urban Heat Island Effect (UHIE) and biodiversity loss threaten the comfort and resilience of our homes.

Our cities are primarily concrete, which causes several issues for our comfort, safety, and the survival of local flora and fauna in a heating climate. The presence of biodiversity in our cities, especially trees with leafy canopies, promotes milder temperatures and greater air humidity. This presence of green improves thermal comfort for a greater sense of well-being and adverse impacts on human health, energy consumption, and urban infrastructure.

Research shows that urban forests have temperatures that are on average 2° degrees celsius lower that unforested urban areas 7 .

The addition of trees and other vegetation to the built environment provides the greatest benefit in mitigating the UHIE. Through the process of transpiration and the provision

of shade, trees help reduce day and nighttime temperatures, especially during summer. They shade streets and footpaths, and their leaves reflect more sunlight and absorb less heat than built materials, reducing the heat absorbed by the built environment. During transpiration, plants draw water from the soil and release moisture through their leaves into the air.

Tree canopies and root systems reduce stormwater flows and nutrient loads that end up in our waterways. They intercept and mitigate the impact of heavy rainfalls. Healthy tree roots help reduce the nitrogen, phosphorus, and heavy metal content in stormwater.

Biodiversity is a superpower of the natural world and we need to leverage its magic in our cities in our efforts to battle climate change and maintain liveability. Benefits of biodiversity in our urban environment include improve air quality, disease resistance, food security, and extreme weather regulation.

⁷ Knight, T., S. Price, D. Bowler, et al. 2021. How effective is 'greening' of urban areas in reducing human exposure to ground-level ozone concentrations, UV exposure and the 'urban heat island effect'? An updated systematic review. Environmental Evidence 10, 12



SMALL SPACES WITH BIG IMPACT

We need to reimagine the role and function of our turf medians and verges, remnant land, easements, and desolate carparks, to meet the pressures posed by climate change, population growth, and urban heating on our cities, services, and community. Collectively, the reimagining, revegetation, and re-wilding of these spaces will be an important link in the chain of green infrastructure within our cities.

Streets make up the largest proportion of our publicly available space. Most streets were designed with efficient car movement in mind, and we need to continue to reimagine them for everyone (people, plants, bugs, and wildlife). They are our most democratic and truly public spaces; the essential arteries of our cities' green infrastructure.

Green streets incorporate multiple elements with the potential to offer a diverse range of habitats to greatly increase urban biodiversity. Habitat types include trees, wetlands and pools, and vegetated areas. These can be incorporated into a relatively small area and offer a potential habitat to microbes, invertebrates, reptiles, mammals, and birds including some of our rarer or protected species. Biodiversity value of a green street increases with the inclusion of low planting of wildflowers, indigenous planting, and the incorporation of diverse microhabitats (such as varied ground topography, planting, and water availability)⁸.

A great example of how we might achieve this strategy in a coordinated way is the City of Melbourne's Urban Forest Strategy, a format that has been adopted by many LGA's across the country to help address the significant challenges facing our urban centres. The strategy aims to:

- increase canopy cover from 22% to 40% by 2040
- increase forest diversity with no more than 5% of one tree species, no more than 10% of one genus and no more than 20% of any one family
- improve vegetation health, soil moisture rates and biodiversity⁹

The strategy relies on a reimagination of the City's central medians, intersections, verge buildouts, rooftops, remnant, and underutilised land to achieve these outcomes. Flexible and all-encompassing strategies such as this help to galvanise anyone with a vested interest in improving the health of our cities, no matter the scale. This sort of coordination is critical for establishing an effective green infrastructure in our cities.

⁸ Perez Gabriel & Katie, Perini. 2018, Nature Based Strategies for Urban and Building Sustainability, Butterworth-Heinemann

⁹ Urban Forest Strategy: Making a Great City Greener 2012-2032, City of Melbourne 2012

SITE PLANNING CONSIDERATIONS FOR CITY GREENING



City greening is essential for urban development and addresses environmental, social, and economic challenges in emerging and growing urban areas.

City greening initiatives support biodiversity, improve air quality, regulate temperatures, and manage stormwater. Socially, it enhances well-being, fosters community interaction, and provides recreational opportunities. On top of the environmental and health benefits, evidence suggests that City Greening provides a wide range of economic benefits including increased property values¹⁰, tourism attraction¹¹, and reduces costs associated with climate control.

Implementing City Greening principles early in the site planning process optimises design solutions, fostering the creation of sustainable, resilient, healthy, and liveable urban environments. This not only enhances the aesthetic appeal of developments but also streamlines approvals and ultimately elevates property values.

While policies and regulations are essential to guide and promote a City Greening agenda, the detailed application of guidelines often falters due to the dominance and inflexibility of engineering constraints. Adopting a City Greening-first approach encourages our teams to challenge the status quo and define solutions that champion the thoughtful integration of vegetation, open spaces, and water management strategies. This approach enhances biodiversity, mitigates the urban heat island effect, improves air quality, and creates enjoyable public spaces.

- ¹⁰ Killicoat et al. 'The economic value of trees in urban areas: estimating the benefits of Adelaide's street trees', Treenet, 2002
- ¹¹ Deng et al. 'Linking urban forests and urban tourism: A case of Savannah, Gerogia', Tourism Analysis, Vol 15, 2010, p167-181

IMPLEMENTING CITY GREENING PRINCIPLES EARLY IN THE SITE PLANNING PROCESS OPTIMISES DESIGN SOLUTIONS, FOSTERING THE CREATION OF SUSTAINABLE, RESILIENT, HEALTHY, AND LIVEABLE URBAN ENVIRONMENTS.

MATT FRANZMANN Director — Design

CONSIDERATIONS FOR MULTIDISCIPLINARY COORDINATION IN THE PUBLIC REALM

Highlighting the critical importance of synergising various disciplines in urban planning and design is essential when emphasising the prioritisation of green infrastructure. Through insightful analysis and practical considerations, our teams can provide a comprehensive guide for professionals involved in the creation and enhancement of public spaces, promoting a holistic and sustainable approach to urban development.

Exploring the significance of multidisciplinary collaboration is essential in ensuring a cohesive and integrated approach to shaping the public realm. This involves uniting diverse disciplines such as town planning, landscape architecture, environmental science, and civil engineering. Such collaboration is crucial in advocating for the incorporation of green infrastructure as a foundational element in urban design. This priority not only emphasizes sustainable practices and biodiversity enhancement but also plays a key role in mitigating the effects of urban heat islands.

The early integration of green infrastructure into the overall planning and design process is another critical strategy. This approach considers factors like walkability, accessibility, and aesthetics to enhance both the functionality and appeal of public spaces. In parallel, building environmental resilience within the public realm requires coordinated efforts. These efforts should address climate change adaptation, effective water management, and the creation of resilient urban ecosystems, ensuring that cities can withstand environmental stresses.

Stakeholder engagement and community involvement are paramount in the coordination process. Engaging local stakeholders and communities ensures that public spaces not only meet diverse needs and preferences but also foster a sense of ownership and connectedness among residents. Additionally, showcasing realworld case studies and best practices that illustrate successful instances of multidisciplinary coordination in public space development can be instrumental. These examples highlight how effectively green infrastructure can be prioritized and integrated.

It is vital to offer practical policy recommendations for policymakers and planners. These recommendations should aim to create supportive frameworks that incentivize and facilitate multidisciplinary coordination, with a particular emphasis on green infrastructure as a critical component for creating sustainable and resilient public realms. Through these comprehensive approaches, urban spaces can be transformed into more sustainable, functional, and inviting environments for all.



Randia fitzalanii (Native Gardenia), Queensland species

WATER IS LIFE: STRATEGIES FOR THRIVING GREEN INFRASTRUCTURE AND ENHANCED BIODIVERSITY

Understanding the delicate balance between water management, thriving green infrastructure, and enhanced biodiversity within urban landscapes is becoming critical in designing for our urban environments. As landscape architects, our mission is to underscore the pivotal role of Water Sensitive Urban Design (WSUD) in fostering sustainable and resilient cities.

In the face of escalating urbanization and climate challenges, integrating Water Sensitive Urban Design (WSUD) with City Greening practices is not just beneficial but essential. The combination of these strategies forms a cornerstone of sustainable urban development, addressing critical water management issues while fostering urban biodiversity and enhancing ecological resilience.

WSUD is not merely a set of engineering solutions; it's a holistic approach that blends water management seamlessly with urban development. Its core lies in creating systems that mimic natural water cycles, reducing pollution and improving water quality through innovative solutions like biofiltration systems, rain gardens, and permeable pavements. These elements are integral to City Greening initiatives, which extend beyond beautification to include the creation of functional, sustainable urban ecosystems. The synergy between WSUD and green infrastructure is evident as they work together to mitigate environmental impacts such as urban heat islands. By incorporating green roofs, walls, and tree-lined streets into urban planning, cities can lower temperatures and improve air quality, making urban environments more liveable and reducing the health impacts of urban heat. Moreover, these green spaces provide critical habitats, create biodiversity corridors, and promote the coexistence of native flora and fauna within the urban matrix, enhancing ecological diversity and resilience.

Policy frameworks also need to support the integration of WSUD principles and green infrastructure in urban planning. Policies that incentivize sustainable water management and green development can drive the widespread adoption of these practices, ensuring long-term sustainability and resilience of urban areas.

It is essential to continue exploring emerging trends and innovations in WSUD and City Greening. The future of urban design lies in these integrative approaches that not only address current environmental and urban challenges but also anticipate and adapt to future conditions. By embedding WSUD and green infrastructure principles early in urban planning processes, we can ensure the development of sustainable, healthy, and thriving urban environments. This strategic integration is crucial for transforming urban landscapes into more sustainable and vibrant ecosystems, securing a resilient future for cities worldwide.



CITY GREENING APPROACHES NEED TO BE TAILORED TO A LOCALITY TO MAXIMISE THE POSITIVE SOCIAL, ENVIRONMENTAL AND ECONOMIC BENEFITS, WHILE ENSURING THEY ARE PRACTICAL TO IMPLEMENT AND EMBRACE THE COMMUNITY'S VALUES.

SUZIE TURNER ASSOCIATE Director — Economics & Property

CONSTRUCTION DETAILING FOR GREEN INFRASTRUCTURE

The success of green infrastructure elements relies on careful construction detailing, ensuring the efficient integration of features like green roofs, permeable pavements, and rain gardens into our urban environments.

Even seemingly ordinary elements like planter beds require a thorough understanding of drainage function, soil volume, and growing medium profiles. Understanding factors like climate, seasonal change, microclimate, and maintenance needs is essential in ensuring the health of these systems.

Construction detailing of green infrastructure elements involves selecting appropriate materials, preparing robust specifications, and implementing techniques that prioritise ecological benefit. While the finished design outcome may look effortless, and critical design elements may be hidden from view, the time and care invested in detailing these elements is crucial in achieving the desired outcome.

DRAINAGE STRATEGIES AND STORMWATER HARVESTING IN URBAN ENVIRONMENTS

In urban environments, effective rainwater management is vital to prevent issues like seasonal flooding. This is particularly challenging in our cities with many impermeable surfaces hindering water absorption. Implementing landscape drainage strategies can be beneficial in managing stormwater efficiently, minimising negative impacts on infrastructure, and providing environmental benefits while maintaining the integrity of landscape design.

Features like permeable pavements and bioswales enable water infiltration, reduce runoff, and supporting groundwater recharge. Additionally, swales and detention basins store stormwater temporarily, preventing downstream flooding and ensuring a gradual release.

To address water shortage in a drying climate, stormwater harvesting provides a solution by capturing winter rainfall that would otherwise end up in drains. During summer, the collected stormwater serves as an alternative water source, alleviating water shortages and reducing reliance on mains supply. The integration of green infrastructure elements, such as green roofs and permeable pavements, enhances stormwater capture and reuse. Green roofs can absorb and temporarily store rainfall, mitigating runoff and providing insulation benefits, with the captured rainwater available for irrigation. Permeable pavements, designed for water infiltration, reduce surface runoff, prevent waterlogging and erosion, and support groundwater recharge.

SOIL AND MULCH SPECIFICATIONS

Creating an environment conducive to plant growth involves thoughtful consideration of soil composition and mulch application. The appropriate soil composition should promote efficient drainage to prevent waterlogging, while also retaining enough moisture during dryer periods. A blend of sand, silt, and clay fosters an ideal environment, with sand promoting soil aeration and drainage, silt enhancing nutrient retention, and clay ensuring effective water retention and nutrient availability. Achieving the right balance among these components results in loamy soil, offering both efficient drainage and substantial water retention.

Soil testing is crucial to understand soil acidity levels, as every plant thrives within specific pH ranges. Adjustments can be made using powdered limestone to raise pH levels or sulfur to lower them, ensuring optimal conditions for plant growth.

Incorporating organic matter like soil conditioner, compost, and decomposed plant material enhances soil structure, increasing aeration, water holding capacity, and nutrient availability, thereby promoting healthy plant growth.

Additionally, mulch serves as a natural insulator, moderating temperature fluctuations to create a stable environment for plant roots. Its weed-suppressing properties enhance the aesthetic appearance of planter beds while minimising competition for nutrients, water, and sunlight, allowing desired plants to flourish. As mulch decomposes over time, it enriches the soil with organic matter, further improving soil health and creating a favourable environment for plant growth.



STRUCTURAL SOILS AND SOIL CELLS

Ensuring the health and longevity of street trees in urban environments is a key priority for our design team who often face challenges associated with limited space and structural constraints. The key challenge is providing sufficient space for tree root development, particularly in confined urban settings created by structures like roads.

Structural soils contain a blend of crushed stone or gravel and soil and are engineered to bear pavement and traffic weight while offering the opportunity for trees growth within these hardstand environments. While cost-effective and supportive, the soil compaction required for structural stability can limit the development of a tree's root system.

An alternative solution comes in the form of soil cells, modular plastic units filled with soil, providing optimal soil conditions for tree growth while supporting pavement. These cells prevent soil compaction, ensuring healthy root growth, and supporting tree stability and allowing space for suitable soil to support robust tree root expansion. Both opportunities present a suitable approach to nurturing street tree growth while preserving the surrounding infrastructure.



BRENTON REYNOLDS Director — Net Zero & Decarbonisation



Monstera delisciosa (Swiss Cheese Plant), Queensland species

CONSTRUCTION, MAINTENANCE, AND STEWARDSHIP

Gardens are not a set and forget component of the built environment. Common complaints from develops and builders is that they are having to spend too much money looking after gardens that are implemented in their developments. This demonstrates not a problem with the garden itself, but a lack of understanding of the root of the issue. Gardens are in a constant state of change and therefore require ongoing maintenance to ensure they are ushered through these changes without becoming liabilities.

START AS YOU MEAN TO GO ON

Getting off to a good start is essential when installing gardens at a city scale. Teams of landscape architects spend significant amounts of their time and their clients' money designing planting schemes for projects that aim to fulfil the 3D designs. All too often those involved are severely let down when they get to site for the inspections and the plants are all struggling or dead. Most often this is caused by ruthless construction programs that forces builders and landscapers to install plants into active construction sites.

There are many risks associated with plants being installed into sites too early. Plants can be under-watered, due to irrigation systems being temporarily shut off for construction or simply through human error. With a myriad of different construction workers walking through sites, plants are often trodden on. Fine layers of construction dust coats onto the leaves of these plants and stops them from photosynthesising.

This is why timing on installing plants onto major urban projects is so important but sadly little understood. Landscape architects must be involved in helping to advise on the appropriate timing of plant installation. They need to act as the voice of reason between the builder and the client which will ultimately lead to less plant and money loss.

Maintenance plans will help protect the capital expenditure and over time will need to be tweaked and refined to meet the changing conditions of the market and climate. There are regular maintenance requirements for gardens that extends beyond the curation of plants; inspections of soil chemistry and testing of irrigation systems, for example.

SETTING GARDENS UP FOR SUCCESS

Having the money to facilitate beautiful gardens in amongst urban developments is not only desirable but has the power to influence the environment. However, thriving gardens are not built on one down-payment. They need ongoing maintenance to ensure they are resilient and fulfil initial plans.

It's crucial to remember that plants live and die; they need ongoing care throughout their life cycle. The end of a plants' life can be brought on by tired soil or failing waterproofing. However, with regular maintenance, many of these factors can be mitigated and managed, extending the lifespan on these plants.

Gardens, no matter their type or location, can be managed throughout seasons of change. More importantly, gardens should be designed to align with the ongoing expenses required to maintain them. Achieving this synergy requires a more open dialogue between a landscape architect and their client to fully understand what the client is willing to pay for ongoing maintenance. Defining this part of the budget will inform larger design decisions, right down to the species selection.



OUR TEAM

Want to learn more about how we can work with you? Speak to our team today:

BRISBANE





Matt Franzmann Director Design mfranzmann@urbis.com.au Andrew Kyriacou Associate Director Design akyriacou@urbis.com.au

SYDNEY



Mark Kuhne Director Design mkubne@urbis.com.au



Kelsy Pearce Senior Landscape Architect Design kpearce@urbis.com.au

WESTERN AUSTRALIA





Suzie Turner Associate Director Economics & Property sturner@urbis.com.au

MELBOURNE



Julie Slifirski Director Design islifirski@urbis.com.au



Brenton Reynolds Director Net Zero & Decarbonisation breynolds@urbis.com.au



Brenton Beggs Associate Director Design bbeggs@urbis.com.au Prioritising green spaces amongst our urban environments not only boosts livability for our cities but provides a healthier and more enjoyable environment for residents and visitors alike. By combating ongoing climate challenges faced in our cities, green infrastructure serves to enrich cities and set us up for a better future.

A place where the natural world and the built environment interject; City Greening strategies provide us with a unique opportunity to craft cities that are built to last

