

UTS Sustainability Vision

August 2021



Acknowledgment

Atelier Ten acknowledges the Traditional Custodians of Country throughout Australia and recognises their continuing connection to land, waters, skies, and community.

We are inspired by and learn from knowledge and stories of Country.

We pay our respect to Traditional Owners and their cultures, and to Elders past, present, and emerging.

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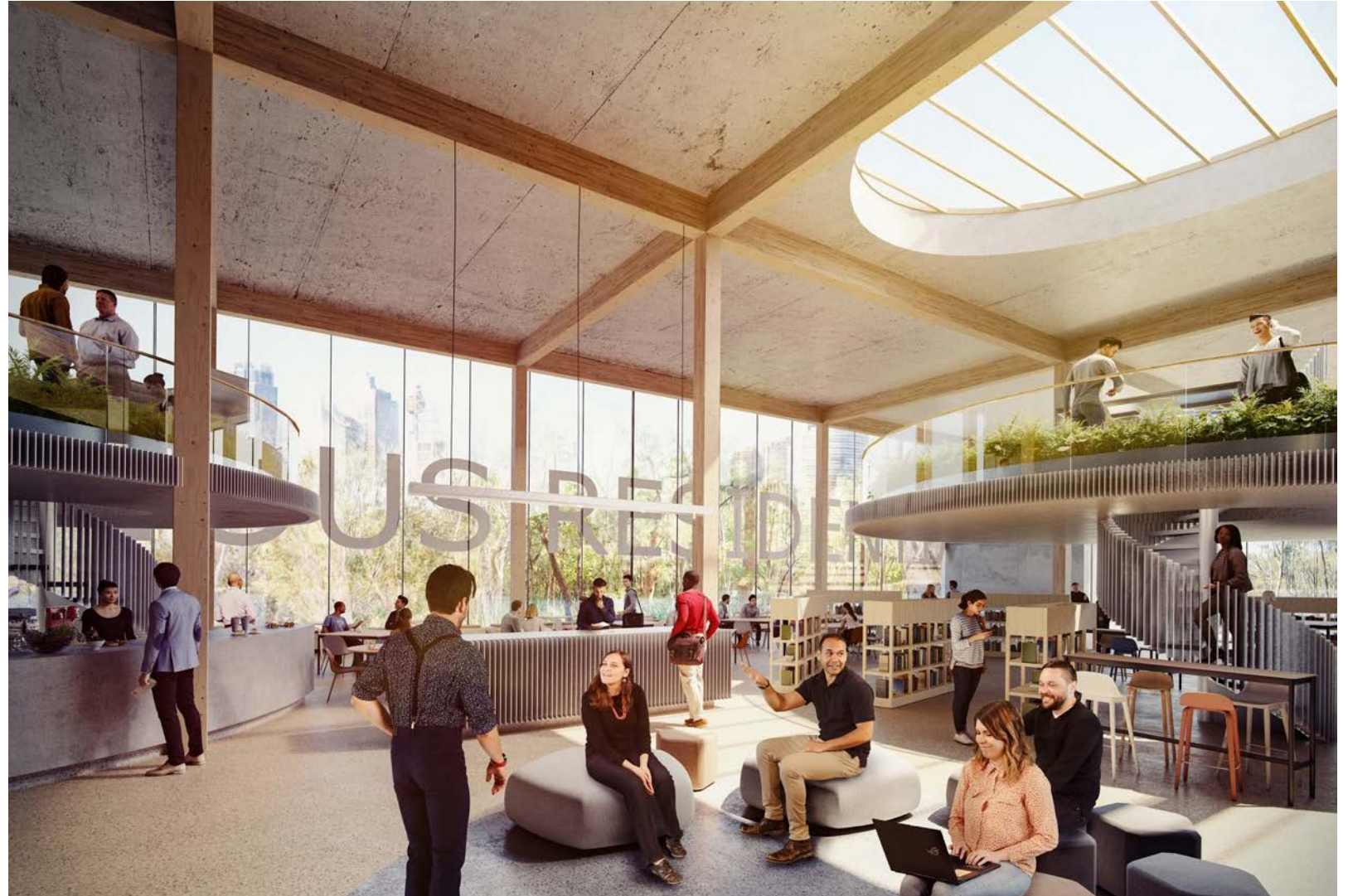
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Approach

Approach

On the basis of UTS, City of Sydney and other documents, and industry sustainability practices, sustainability themes and strategies have been selected that are relevant to UTS and offer the largest environmental benefit to the community.

To structure a delivery approach for each theme, guiding principles are established first. Then, supporting performance targets are suggested. A series of initiatives are proposed to deliver these outcomes at varying project life-cycle phases – planning, design, and operations.

Our aim is to leverage the unique opportunity presented by this large amalgamated site to develop a holistic sustainability strategy that is appropriate for a development of this scale and importance. A strategy that considers the long term health and well-being of people, animals, plants and the planet. A strategy that clearly articulates how this institution responds and contributes to these important themes. A strategy that helps shape a more sustainable and resilient UTS.



FIGURE 1 – THE CASE FOR AMBITION

Strategic Context

Strategic Context

These documents layout policy ambitions and priorities for master planning in NSW, metro Sydney, Pyrmont and the UTS campus. All come to bear on the focus of a UTS master plan.

Key and consistent themes across this policy context include:

- zero carbon
- responsible and efficient consumption and production
- climate resilient and adapted
- biodiversity, ecosystem functioning, ecosystem services and human well-being
- integrated active transport
- flexible, efficient and resilient water cycle
- leveraging open and real time data with smart city digital technology
- socially sustainable, inclusive and equitable communities
- good health and wellbeing
- connection to Country
- environmentally and socially responsible value chains
- multilateral governance centred collaboration and co-creation

Particular consideration has been given to the Pyrmont Peninsula Place Strategy and its aspirations for a 'low carbon, high performance' precinct, including:

- resilient
- solar and batteries
- recycled water
- no on-site parking for residential development
- net-zero water and energy targets
- flexibility and future adaptation

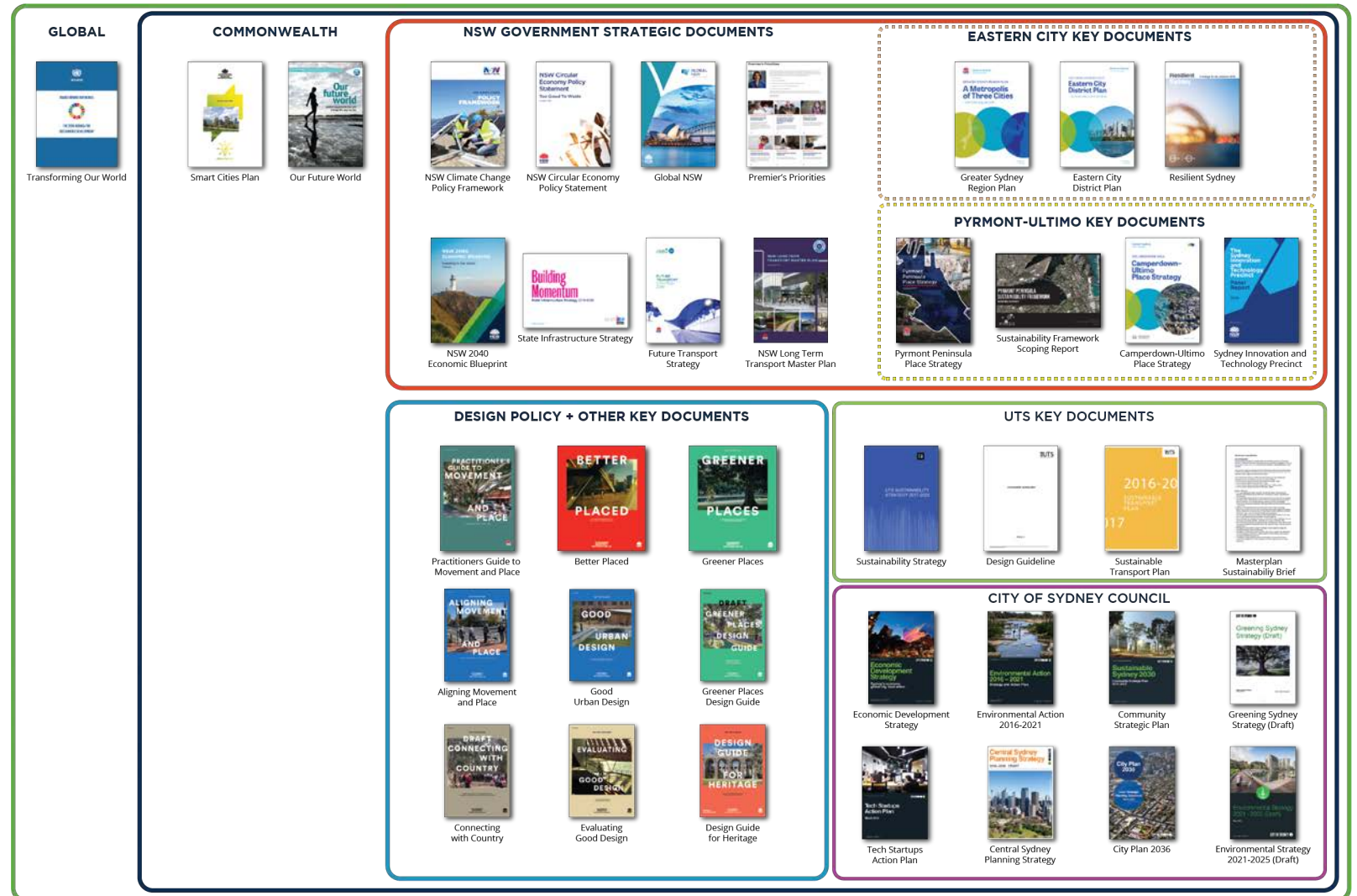


FIGURE 2 – UTS MASTER PLAN POLICY ENVIRONMENT

Pyrmont Peninsula Place Strategy

Strategic Context

The Pyrmont Peninsula Place Strategy released in 2020 sets the direction for the area. It seeks to position Pyrmont to be an attractor for global investment.

It puts forward 10 key directions for the future of the peninsula, as well as five 'Big Moves' to unlock the potential of Pyrmont, with a focus on four key sites where development will drive new jobs while providing the impetus for the 'Big Moves' - UTS in Ultimo is one of those key sites and features heavily throughout the Strategy.

In regards to sustainability specifically, four of the 10 Directions, and one of the Five Big Moves are directly related to sustainability in the built environment.

Suggestions related to high performance buildings are:

- resilient
- solar and batteries
- recycled water
- electric vehicle supporting infrastructure
- no on-site parking for residential development
- net-zero water and energy targets
- flexibility and future adaptation

The document also encourages 'great homes' that suit diverse communities and the heritage of the area.

The associated Pyrmont Peninsular Sustainability Framework Scoping Report proposes four sustainability framework pillars:

1. Multi-Utility Hubs as Precinct Infrastructure
2. Green Streets and Active Spaces
3. High Performance New Buildings
4. Offsetting to deliver a Net Zero Outcome.

10 Directions

-  **Jobs and industries of the future**
-  **Development that complements or enhances the area**
-  **Centres for residents, workers and visitors**
-  **A unified planning framework**
-  **A tapestry of greener public spaces and experiences**
-  **Creativity, culture and heritage**
-  **Making it easier to move around**
-  **Building now for a sustainable future**
-  **Great homes that can suit the needs of more people**
-  **A collaborative voice**

Five Big Moves

- BIG MOVE 1** **A world-class harbour foreshore walk**
- BIG MOVE 2** **A vibrant 24-hour cultural and entertainment destination**
- BIG MOVE 3** **Connect to Metro**
- BIG MOVE 4** **Low carbon, high performance precinct**
- BIG MOVE 5** **More, and better activated public space**

Action 8

Investigate the delivery of multi-utility hubs and integrated models of car parloing.

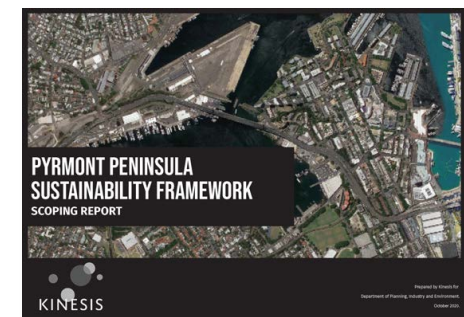


FIGURE 3 – KEY ELEMENTS OF THE NSW GOVERNMENT'S PYRMONT PENINSULA PLACE STRATEGY

Pyrmont Peninsula Sustainability Framework – Scoping Report

Strategic Context

The Pyrmont Peninsula Sustainability Framework – Scoping Report supporting document's four sustainability pillars generally align with industry ambitions and practices (see extract titled *2041 Performance Criteria*). The exception being the focus on 'precinct based sustainability solutions' and the associated 'multi-utility hubs as precinct infrastructure.'

For the Pyrmont Peninsula, it is proposed that these hubs are strategically located across the peninsula to deliver:

1. Precinct parking.
2. Electric vehicle charging.
3. Grid-scale battery.
4. Organic waste systems.
5. Recycled water factories.
6. Social infrastructure to deliver bike and end-of-trip facilities.

There is no discussion about how these multi-utility hubs could/should/would be delivered, whether on public or private land, and the way in which they could/should/would be operated. As well as the numerous intrinsic issues with the distribution of utilities between private customers across public land.

It does suggest 'key next steps to be resolved are:'

- **Site identification** - work through the ordering hierarchy of connectivity, access, ownership etc and confirm and locate sites.
- **Feasibility and governance options** - Develop business case for capital and operational costs, collaboration, funding and ownership models.
- **Design a demonstration scheme** - explore an urban concept on the best and most appropriate first site and which areas of Pyrmont Peninsula would be prioritised with street and public domain improvements.

This suggests that if the NSW Government is intent to pursue multi-utility hubs on the Pyrmont Peninsula responsibility for their development sits with DPIE. Additionally, if there is an expectation that UTS may host one of these multi-utility hubs a separate scoping and feasibility study should be conducted in partnership with the NSW Government, and a specific focus on benefits for the University. Without direct and intentional support from the NSW Government at this stage multi-utility hubs should not form a part of the UTS Sustainability Vision.

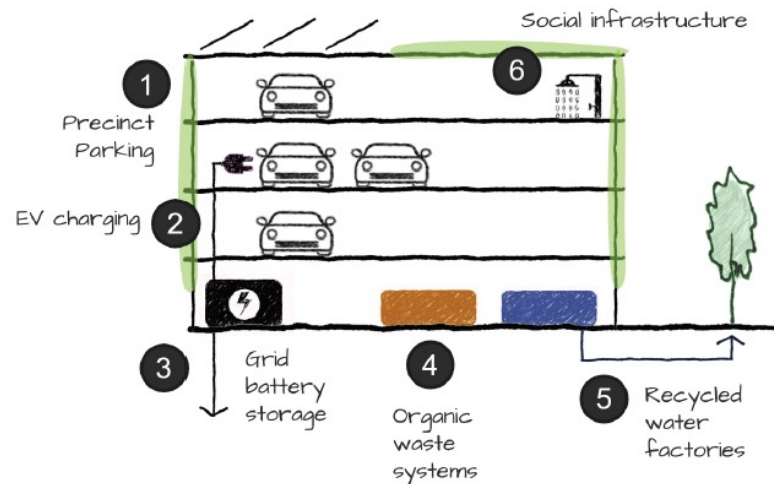


FIGURE 4 – SUMMARY OF THE SUPPORTING PYRMONT PENINSULA SUSTAINABILITY FRAMEWORK – SCOPING REPORT

5. 2041 PERFORMANCE CRITERIA

<p>Net Zero</p> <p>Net Zero emissions by 2041</p> <p>Despite the additional growth in jobs and housing is modelled, a net zero outcome can be achieved as follows:</p> <ul style="list-style-type: none"> • 380,000 tonnes (existing emissions) • + 120,000 tonnes (BAU growth) • - 460,000 tonnes (reduction impact of four pillars and assumed AEMOs emissions reduction of 0.1 kgCO₂e/kWh) • - 60,000 tonnes (offsetting per year) 	<p>25MW</p> <p>New local solar PV delivered by Multi-Utility Hubs & high-performance buildings</p> <p>Delivered through Multi-Utility Hubs and new building standards, such as higher BASIX Energy targets and NABERS requirements for commercial buildings. This equates to approximately 10% of electricity delivered locally by 2041.</p>	<p>Zero</p> <p>New on-site parking</p> <p>No on-site parking in new residential construction which is expected to deliver:</p> <ul style="list-style-type: none"> • Up to \$100,000 saved from the cost of a new building • \$300 per year per space for lighting and ventilation energy demands • 20,000 less truck movements avoided through less excavation for parking 	<p>200</p> <p>New potential shared mobility vehicles throughout the precinct</p> <p>By decreasing on-site parking and delivering lower parking rates there is the potential to deliver an additional 200 car share vehicles to the area through private investment.</p>
<p>100MWh</p> <p>Battery storage from multi-utility hubs and electric vehicles</p> <p>Delivered through the combination of grid scale battery and grid renewable batteries from electric vehicles, battery storage would help manage evening peak demands, create increased network resilience and facilitate increased local renewable energy.</p>	<p>10ML</p> <p>Recycled water generated for new greening water demands</p> <p>The Multi-Utility Hubs could enable recycled water factories that draw on locally available sewer infrastructure and treat the water for irrigation of streets and canopy and public open space. This could be extended to include internal non-potable uses in new buildings, including irrigation of green roofs and walls, toilet, laundry and cooling towers in adjacent buildings.</p>	<p>2ha</p> <p>New active public space</p> <p>The strategic removal of resident on-street parking (1,200 spaces) provides young children and adults the opportunity to explore the street as being space equal to gardens, balconies, and public parks. It recognises that streets are essential parts of any community, not empty roads to carry traffic and park cars, and delivers approximately 2 ha of distributed new active public space.</p>	<p>25%</p> <p>Canopy cover</p> <p>Delivered through green streets which would enable approximately 2 ha of distributed new active public space and 10 ha of new green facades across the ground and lower facades of new buildings, but through recycled water.</p>

7. LOCATION CRITERIA FOR MULTI-UTILITY HUBS

This framework proposes an upfront and staged implementation of precinct based multi-utility hubs so we de-risk development and accelerate and meet all the parking, water, waste and energy charging demand for new and existing residents. Located on public or private land or either standalone or integrated into the restoration of a larger area, potentially using land that is marginal to suitability for residential or commercial development such as under elevated roadways.

- 1. Near main roads**
Near main roads for access – to work effectively the decentralised parking component must ideally be located near major access roads.
- 2. Good access for community**
Accessible by foot and within close proximity to residential and mixed-use areas to prevent local traffic from being generated by residents trying to find on-street parking.
- 3. Near light rail for transport integration**
Near light rail for transport integration – positioned within 500m of light rail stops, future metro and bus transport locations so to be embedded within and leverage the existing mobility infrastructure.
- 4. Integration of Multi-Utility Hubs**
Multi-Utility Hubs are located and configured for decoupled and adaptable parking, electric vehicle charging, grid-scale storage, recycled water, organic waste digestion and social infrastructure.

Key next steps to be resolved are:

- **Site identification** - work through the ordering hierarchy of connectivity, access, ownership etc and confirm and locate sites.
- **Feasibility and governance options** - Develop business case for capital and operational costs, collaboration, funding and ownership models.
- **Design a demonstration scheme** - explore an urban concept on the best and most appropriate first site and which areas of Pyrmont Peninsula would be prioritised with street and public domain improvements.

UTS

Strategic Context

The University has a series of policies, strategies and guidelines which provide direction to the sustainable design and operation of its facilities. At the highest level UTS has made a commitment to 'contribute to the achievement of the Sustainable Development Goals by ensuring our campuses and major programs are environmentally sustainable and socially inclusive.

The ambition in the University's *Sustainability Policy* is to be a thriving place, while respecting the wellbeing of all people and the health of the whole planet aligns with expectations for a top tier institution.

Sustainability Principles:

- Local-global perspective
- Precautionary principle
- Whole systems approach
- Shared responsibility
- Participation and communication
- Continual improvement

The *Sustainability Strategy* expands on how these principles are demonstrated in their day to day operations.

Through Operational activities, UTS aims to:

- Achieve a balance between minimising the environmental impact of the University's operations, enhancing social equity and maintaining long term financial viability
- Pursue opportunities to improve organisational sustainability through the use of innovative design, technology, processes and business models
- Ensure that the University is prepared for current and future sustainability changes
- Embed sustainability principles into the University's supply chain and procurement of goods and services
- Improve sustainable practices on campus by fostering positive behaviours change in staff, students and visitors
- Strive for continual improvement in efficiency and sustainability performance

The Sustainable Design Guidelines, which form a part of the UTS Design Guidelines, set the specific performance benchmarks expected of the University's built environment. Though they have not been updated since June 2016 they provide a good set of criteria for a holistically sustainable development.

Sustainable Design Guidelines

- Recycle Buildings, Use Existing Infrastructure
- Protect and Enhance the Site's Natural Ecosystems
- Design and Build Energy Efficient Buildings
- Air Quality
- Save Water
- Make the Building Healthy
- Noise
- Light
- Select Low Impact Construction Materials
- Life Cycle Initiatives and Adaptability of Building
- Waste
- Monitoring and Feedback

The *UTS Master Plan Sustainability Brief* takes these design guidelines and rationalises them for the contemporary context and proposed development scope. It also aligns them with the strategic context as much as practicable.

Key to delivery of much of the sustainability aspirations is aligning them with the assurance third-party sustainability rating tools provide, like Green Star, NABERS and WELL. These tools provide:

- independent review
- transparency of methodology
- accountability at each phase of the lifecycle

They also rightly focus on achieving positive environmental and social sustainability outcomes rather than being too prescriptive.

UTS has now enshrined their use in their forthcoming updated *Sustainability Strategy* that all 'new UTS buildings and substantial refurbishments must achieve a minimum 5 star Green Star certified rating.'

The University also has a Carbon Neutral plan in development due for finalisation in the final half of 2021.

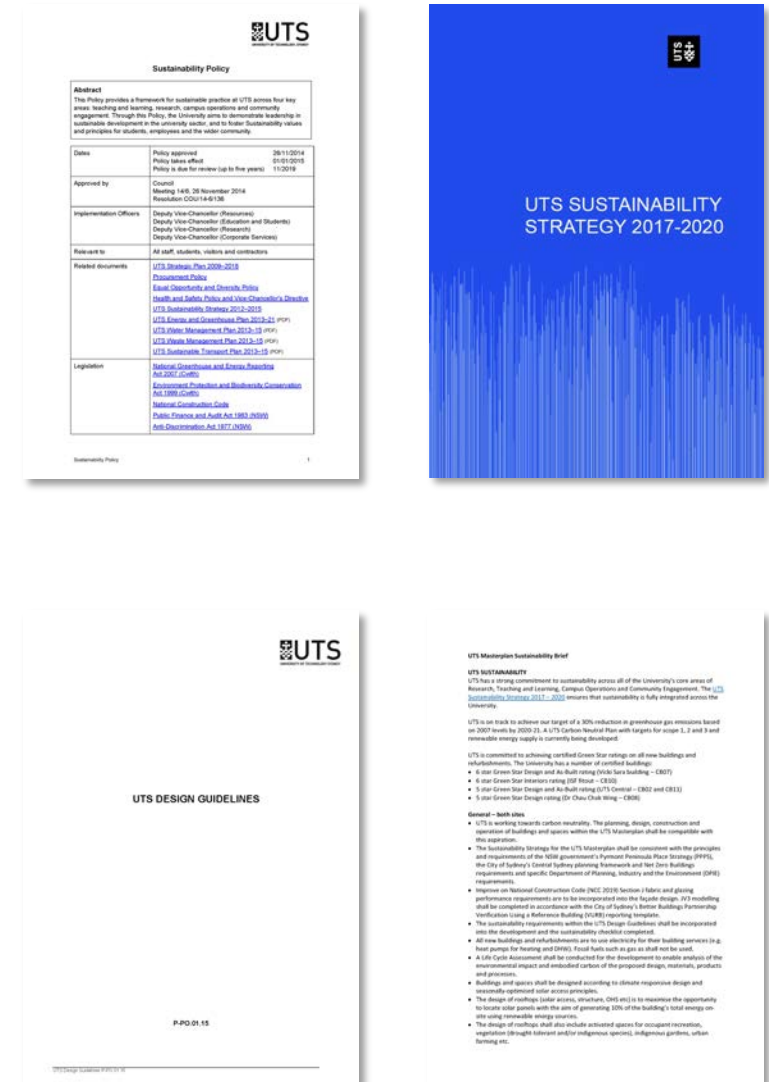


FIGURE 5 – UTS SUSTAINABILITY POLICY ENVIRONMENT

City of Sydney Strategic Context

The City of Sydney's *Environmental Strategy 2021-2026 (Draft)* recently closed its public consultation process and the document gives insight into the future ambitions and directions for the City.

It sets out 4 key directions and 23 supporting actions that it will take to achieve meaningful environmental outcomes in the city. The supporting actions related to non-council owned assets align, as expected, with progressive industry best practice, and in general the strategy has a greater focus on social sustainability and citywide integration.

It also sets a series of quantified targets for businesses in the LGA which will have consequences for the University's operations. These targets relate both to building resource use and the public domain.

The City continues to use terminology that is not industry standard when referencing energy and greenhouse gas emissions. The term 'net zero energy' would normally refer to 'buildings [that] combine energy efficiency and renewable energy generation to consume only as much energy as can be produced onsite through renewable resources over a specified time period.' As a general rule this is impossible for a multi-story building in an urban context.

However, the city defines it as 'a net zero energy building is highly energy efficient and consumes no more energy than that which is generated on-site and/or procured from off-site renewable energy sources.' This is known more commonly as net zero, net zero carbon, or simply zero carbon in operation. The City of Sydney recently released a report titled *Planning for net zero energy buildings: Performance standards to achieve high-performing net zero energy buildings in Greater Sydney* to clarify their intentions.

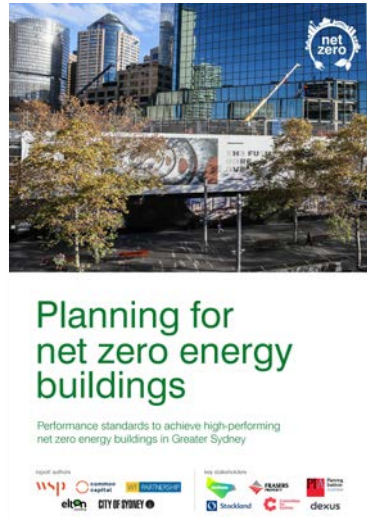
This is an important distinction to understand when submitting any development applications to the City and discussing them.

This Sustainability Vision proposes a suite of climate positive actions and design responses aligned with net zero ambitions from NSW Government, expectation under the Paris Agreement and industry more generally, as well as currently under development by the University.

Beyond this, UTS is a founding member and active participant of the City of Sydney's *Better Buildings Partnership*.



Local area	
Targets	Latest data
Carbon	
20% reduction in gross revenue gas emissions by 2025, from 2020 baseline	20% reduction (June 2019)
Net zero emissions by 2035	17.7% (BGE average, December 2020)
50% of electricity demand met by renewable sources by 2025*	223 (Renewable City June 2019)
Water	
Reduce residential potable water use to 170 litres per person per day by 2025	2.32 (throughput by June 2018)
50% reduction in non-residential potable water use per 100 by 2025, from 2019 baseline	Data not yet available
20% reduction in the annual solid pollution load discharged to waterways vs stormwater by 2025†	Data not yet available
10% reduction in the annual surface load discharged to waterways vs stormwater by 2025†	
Greening	
Increase overall green cover to 40% across the local area, including 27% tree canopy by 2025	33% green cover (2020)
	19.2% tree canopy (2020)
Waste	
90% diversion from landfill of residential waste with 50% as source-separated recycling by 2025	40% diversion, 27% source-separated recycling (June 2020)
90% diversion from landfill of commercial and industrial waste by 2025	50% diversion (BGE average, June 2016)
90% diversion from landfill of construction and demolition waste by 2025*	77% diversion (BGE average, June 2016)
10% reduction in residential waste generation per capita by 2025, from a 2015 baseline	12% per capita reduction in waste since 2015 (June)



A net zero energy building is highly energy efficient and consumes no more energy than that which is generated on-site and/or procured from off-site renewable energy sources.



FIGURE 6 – KEY ELEMENTS OF THE CITY OF SYDNEY'S POLICY ENVIRONMENT

Synthesis

Synthesis

Strategic Context

The preceding exploration of the strategic context that will materially effect any future development by UTS has drawn out a series of recurring sustainability relevant themes and issues. These have been summarised in the figure to the right.

This Sustainability Vision aims as a minimum to address and deliver best practice outcomes against each of them.

UN SDGs	Smart Cities Plan	NSW	City of Sydney	Pyrmont Peninsula Place Strategy	UTS, Environmental Sustainability Guidelines
SDG 3 Good Health and Well-being	Improve air quality in urban areas	Net-zero emissions by 2050	Improve energy efficiency, water efficiency and waste management in existing buildings	Better spaces, streets and parks; a rich canopy of trees; and access to the foreshore	Recycle Buildings, Use Existing Infrastructure
SDG 6 Clean Water and Sanitation	Encourage the use of ratings systems	Be more resilient to a changing climate	Drive all new buildings to be resource-efficient and net zero energy	Celebrating Pyrmont Peninsula's culture, heritage and connections to Country	Protect and Enhance the Site's Natural Ecosystems
SDG 7 Affordable and Clean Energy	Facilitate carbon neutral precincts	Use the development of precincts... [to] speed up innovation.	Support the transition to zero-emissions transport	Safer, greener streets integrating with new public transport	Design and Build Energy Efficient Buildings
SDG 8 Decent Work and Economic Growth	Leveraging open and real time data	Enhancing water resilience and better drought- proofing properties	Encourage community uptake of renewable electricity and stimulate the green economy	An adaptive, sustainable and resilient built environment	Air Quality
SDG 9 Industry, Innovation and Infrastructure	Driving use of energy efficient technologies	Develop a digital emerging technology industry strategy	Incorporate the perspectives of Aboriginal and Torres Strait Islander people in environmental action	High Performance New Buildings	Save Water
SDG 11 Sustainable Cities and Communities	30 minute cities	Increasing the number of Aboriginal young people reaching their learning potential	Build community resilience and momentum on climate action	Offsetting to deliver a Net Zero Outcome	Make the Building Healthy
SDG 12 Responsible Consumption and Production	Green urban spaces	Greener public spaces	Support the development of circular economy systems	Comprehensive street and park tree planting program	Noise
SDG 13 Climate Action	Human capital	Greening our city	Drought-proof the city by facilitating water recycling	New buildings designed to high environmental standards	Light
SDG 14 Life Below Water	Reduced congestion, increased productivity and shorter travel times	Minimise consumption of finite resources	Regenerate polluted waterways, air and land	Low carbon, high performance precinct	Select Low Impact Construction Materials
SDG 15 Life on Land		Decouple economic growth from resource consumption	Reduce the amount of residential waste sent to landfill through avoidance and resource recovery		Life Cycle Initiatives and Adaptability of Building
SDG 16 Promote just, peaceful and inclusive societies		Design out waste and pollution			Waste
		Keep products and materials in use			Monitoring and Feedback
		Innovate in resource efficiency, give preference to higher order re-use and repair opportunities			

FIGURE 7 – SUMMARY OF RECURRING SUSTAINABILITY THEMES

Vision

Strategic Context

In order to rationalise the various ambitions across the broad cross section of organisations, institutions, and levels of government we have categorised them into a series of nine sustainability themes.



FIGURE 8 – SYNTHESIS OF RECURRING SUSTAINABILITY THEMES

UTS Sustainability Vision

Sustainability Themes

UTS Sustainability Vision

The analysis shows us that these key themes come through. They are as follows, and need to be dealt with through a mix of built form response through planning and design, as well as policy, operations, maintenance, governance.



FIGURE 9 – UTS MASTERPLAN SUSTAINABILITY THEMES

Climate Positive

UTS Sustainability Vision

UTS's campus and facilities will be built and operated in a way that contributes to positive climate outcomes. This includes managing carbon emissions and alignment with UTS's forthcoming Carbon Neutral Plan. The precise targets, methodology and timeline for the University's carbon neutrality is in development, however all projects should contribute towards the general aspirations.

Principles

- Minimise embedded (upfront) greenhouse gas emissions in construction materials and processes.
- Passive design and best practice systems design minimise operational energy use
- Enable building to operate now or in the future without on-site fossil fuel combustion.
- Renewable energy through on-site sources like rooftop PV, etc. as fits the site.
- Buy renewable power
- Offset all marginal emissions

Targets

- Reduce embedded (upfront) emissions by 30% relative to business as usual.
- Zero fossil fuel use for regular building operations
- Achieve a whole-building (including building systems) operational energy savings of 20% relative to NCC Section J performance baseline.
- Procure all remaining operating energy from renewable sources

Planning opportunities

- Materially efficient structural design to reduce the volume of concrete and steel minimising total material volume in building.
- Choose low embodied carbon materials and products for major building systems (structure, cladding, foundations, etc).
- Minimise operational energy through climate responsive design.
- Construct the building to exploit use of thermal mass to regulate internal temperature.
- Optimise all façades to shade glazing to reduce cooling energy use yet provide high quality daylighting.

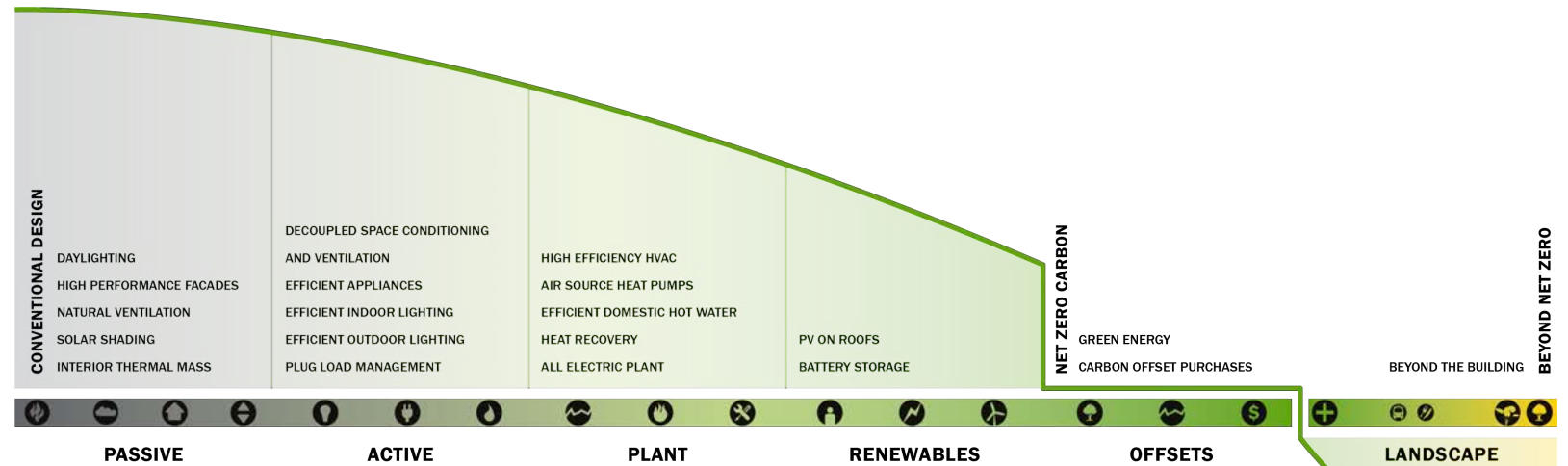


FIGURE 10 – PATHWAY TO CLIMATE POSITIVE

Design opportunities

- Prioritise timber and other plant-based building materials that sequester carbon in their growth.
- Choose low embodied carbon materials and products for major building systems (structure, cladding, foundations, etc).
- Minimise operational energy through climate responsive design.
- Construct the building to exploit use of thermal mass to regulate internal temperature.
- Optimise all façades to shade glazing to reduce cooling energy use yet provide high quality daylighting
- Maximise the free cooling provided by outdoor air through design for cross ventilation, night purging & 100% economy cycle capacity.
- Optimise envelope to mitigate thermal bridges.
- Install roof top PV arrays for on-site renewable electricity generation.
- Create or connect to existing district energy (e.g. chilled water) networks where possible.

Operational opportunities

- Guarantee and verify operational energy efficiency through building performance tuning.
- All purchased electricity 100% renewably generated
- Purchase offsets for all residual emissions (scope 1, 2 and nominated scope 3) from construction and operation with nature-based solutions.

Responds to

- UN SDGs
 - SDG 3 Good Health and Well-being
 - SDG 9 Industry, Innovation and Infrastructure
 - SDG 11 Sustainable Cities and Communities
 - SDG 12 Responsible Consumption and Production
 - SDG 13 Climate Action
- UN Paris Agreement
- IPCC
- NSW Climate Change Policy Framework
- Pyrmont Peninsula Place Strategy
- City of Sydney, Environmental Strategy 2021-2026
- City of Sydney, Planning for net zero energy buildings
- UTS Sustainability Policy
- UTS Sustainability Strategy
- UTS Sustainable Design Guidelines
- UTS Carbon Neutral Plan (forthcoming)

Healthy and Inclusive UTS Sustainability Vision

UTS Master Plan is an opportunity to support public health initiatives and provide exceptional environment which enrich the health and wellness of students, staff and visitors.

Principles

- Improving physical activity by encouraging active mobility and recreational exercise;
- Improving local air quality by transport electrification, large-scale urban greening and eliminating on-site combustion;
- Improving mental health through connection to nature, biophilia, safety, sense of belonging and enhancing social engagement.
- Passively designed building envelope to deliver thermal comfort which offers comfort and wellness with minimal energy and user input.
- Built environment is welcoming to culturally diverse users communities.
- All built environment is fully physically accessible and inclusive.
- Public spaces and amenities support gathering, socialising and collaboration.
- Provide spaces that can be used for community activities and services.
- Precinct development and operations promote responsible labour practices and support human rights throughout UTS's many supply chains.

Targets

- Achieve an appropriate Daylight Factor (DF) in both workspaces and residential spaces.
- Achieve indoor thermal comfort aligned with the Green Star standards with reasonable PMV levels.
- Provide ventilation at rates aligned with PCA A Grade required by CO₂ responsive control.
- Maintain indoor CO₂ levels at no greater than 200 ppm higher than coincident outdoor air conditions.
- Maintain indoor particulate count at safe levels even at bushfire events.

Planning opportunities

- Provide adequate shading to limit sunlight direct sun in workspaces and habitable rooms.
- Provide frequent, attractive (daylit) access stairs throughout building.

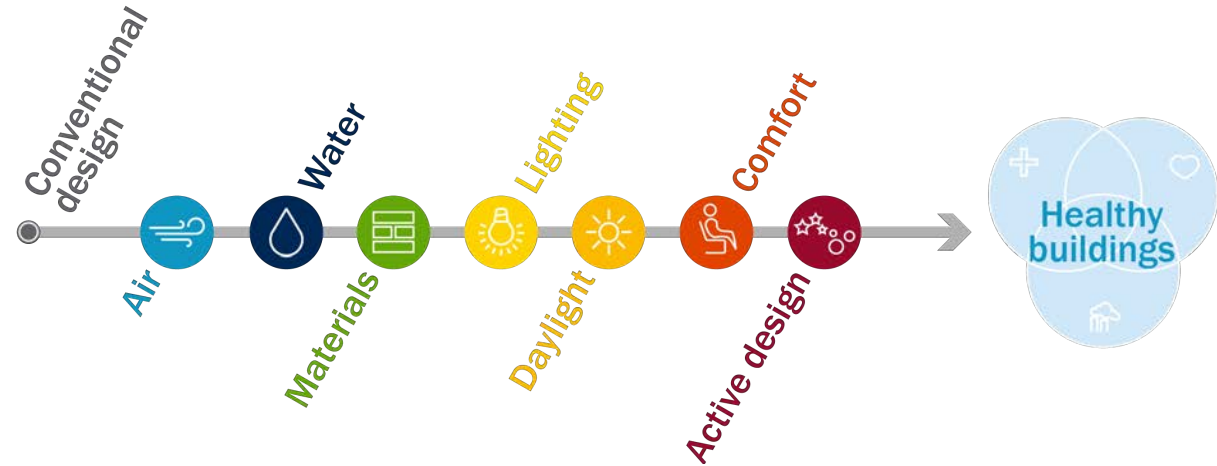


FIGURE 11 – PATHWAY FROM CONVENTIONAL DESIGN TO HEALTHY BUILDINGS

- Locate mechanical system fresh air intake locations away from pollution sources and provide best practice filtration.
- Ensure all dwelling units receive some direct sun.

Design opportunities

- Provide adequate shading to limit sunlight direct sun in workspaces.
- Select thermally improved, air-tight glazing systems and ensure installation achieves required U-value.
- Mechanical ventilation systems supply with mixed mode
- Air handlers equipped with capacity for additional filtration to be installed as needed to exclude pollutants.
- Prevent moisture build up / transfer through building envelope through elimination of thermal bridges and specification of intelligent vapour permeable membranes
- Specify low or no VOC emitting finish materials and products.
- Celebrate natural materials through biophilic design

Operational opportunities

- Improve dietary health by eliminating fast food or junk food from public F&B tenancies and providing healthy and affordable food options.

- Eliminate pesticide use from landscape maintenance
- High quality cleaning practices, including the elimination of hazardous or harmful ingredients in cleaning, disinfection and sanitisation

Responds to

- UN SDGs
 - SDG 3 Good Health and Well-being
 - SDG 11 Sustainable Cities and Communities
 - SDG 13 Climate Action
- Pyrmont Peninsula Place Strategy
- City of Sydney Environmental Strategy 2021-2026
- City of Sydney, Urban Ecology Strategic Action Plan
- City of Sydney, Greening Sydney Strategy (Draft)
- UTS Sustainability Policy
- UTS Sustainability Strategy
- UTS Sustainable Design Guidelines

Connected to Country

UTS Sustainability Vision

A strong understanding of and connection to Country will produce a campus that has a distinct identity, shaping a unique sense of place that is necessary to attract investment and ensure longevity, social justice and inclusion.

Principles

- Acknowledge Traditional Owners and other Aboriginal peoples in the local and regional communities.
- Cultural heritage sites are protected and accessible to local Aboriginal communities for ongoing cultural practices.
- Indigenous ecosystems endemic to the local area have been regenerated.
- Indigenous culture, heritage, and knowledge of local country is embedded and evident in the built and cultivated environments of the Precinct.
- Opportunities for Indigenous communities are regularly created through ongoing Precinct development.
- Project procurement processes respond to cultural considerations Aboriginal and Torres Strait Islander communities, especially local traditional owners.
- Employment opportunities for Aboriginal people within Aboriginal owned businesses as well as other businesses.

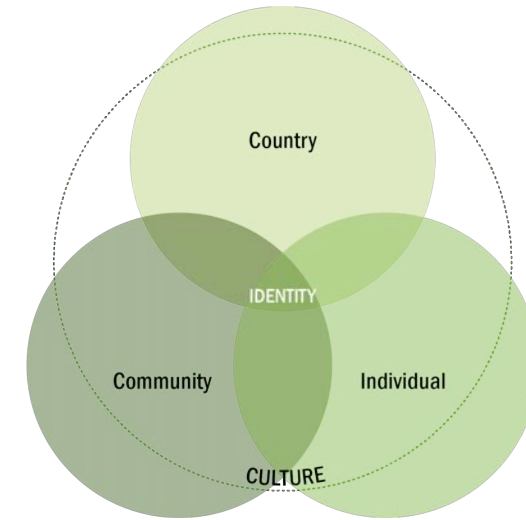
Targets

- Include Indigenous designers and decision makers, especially ones with Ancestral connections to these lands, throughout the project.
- Develop project specific indicators to measure impact to Country and culture.

Design opportunities

- Avoid damaging intact or remnant Country, especially areas with complete ecologies or natural heritage.

Reciprocal relationships with Country and community form cultural practices, which in turn shape individual identities. All are also influenced by external factors including environment, politics, and wider society.



Adapted from GANSW Connecting with Country Framework (Draft)

FIGURE 12 – INTERRELATIONSHIPS BETWEEN COUNTRY, COMMUNITY AND INDIVIDUALS.

- Protect and restore local Indigenous historical and cultural sites.
- Reinstate Aboriginal names for places, and help stakeholders understand, pronounce and value these names.
- Replace offensive place names with culturally inclusive and appropriate ones.
- Multi-lingual signage incorporating local Indigenous dialect
- Public art integrating Aboriginal and Torres Strait Islander artists

Operational opportunities

- All projects engage in the UTS Jumbunna process for respectfully engaging with local on-Country custodians and other Aboriginal and Torres Strait Islanders living and working in the community.
- All projects report progress in line with the Centre for the Advancement of Indigenous Knowledges (CAIK) and Social Impact Framework (SIF).

Responds to

- UN SDGs
 - SDG 8 Decent Work and Economic Growth
 - SDG 10 Reduced Inequalities
 - SDG 11 Sustainable Cities and Communities
 - SDG 16 Peace, Justice and Strong Institutions
- National Agreement on Closing the Gap
- Pyrmont Peninsula Place Strategy
- NSW Aboriginal Procurement Policy (APP)
- GANSW Connecting with Country Framework
- City of Sydney Social Sustainability Policy & Action Plan 2018-2028
- UTS Reconciliation Statement

Resilient and Adaptable UTS Sustainability Vision

The aspiration of UTS, as a forward looking development, is to be resilient to disruptions, robustly mitigating foreseen risks like power outages and extreme weather. UTS will provide safe shelter to students, staff and the public during extreme events while also maintaining a high level of business continuity. It will be adaptable to the consequences of the changing climate and flexible to advancements in technologies and changes in use over time.

Principles

- Resilient to short term shocks (extreme weather, utility failures).
- Adaptable to long term stresses (climate change, increasing energy costs).
- Flexible to changing market conditions and environmental performance expectations.

Targets

- Achieve passive thermal comfort aligned with *TM59: Design methodology for the assessment of overheating risk in homes* (CIBSE, 2017).
- Demonstrate ability to maintain indoor environments under future climate scenarios.
- Designed for easy, centralised building services upgrades or supplementing of energy systems to cope with future temperature increases
- Demonstrate flexibility to accommodate changing occupant needs
- Provide clean fresh air when ambient pollution levels are high (bushfire smoke).
- Design to RCP 8.5 climate scenarios.

Planning opportunities

- Utilise a climate responsive design approach, optimise building envelope for passive climate control.
- Include allowance for additional capacity in ducting and plant rooms to support integration of mechanical ventilation.
- Green roofs and extensively vegetated public realm to mitigate urban heat island effects and protect against increasing peak temperatures.

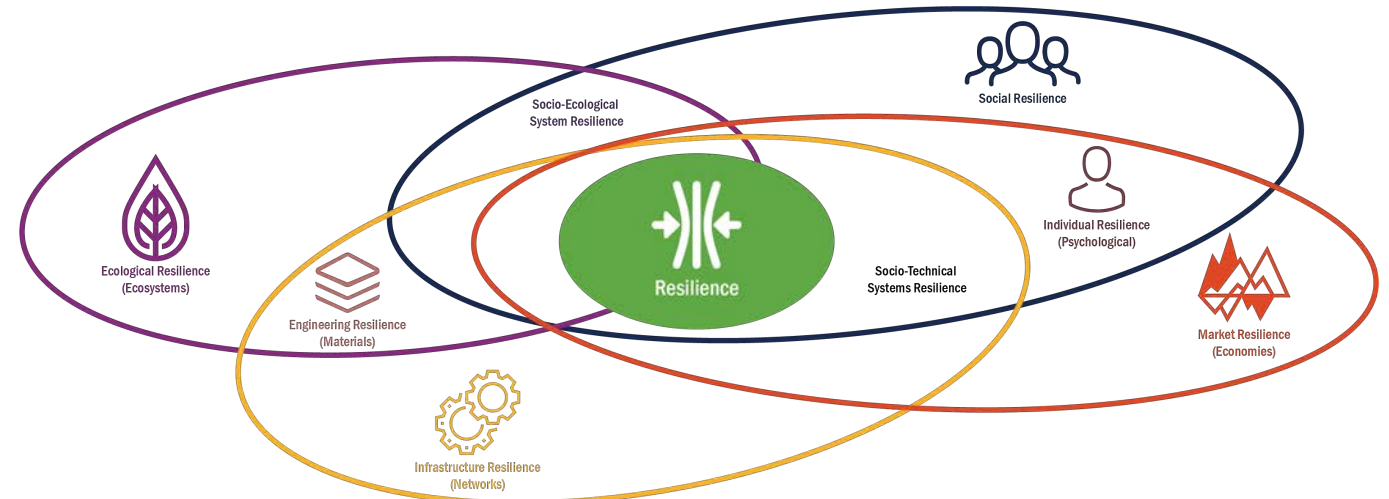


FIGURE 13 – MULTIDISCIPLINARY OVERVIEW OF URBAN RESILIENCE

- Locate above Probable Maximum Flood levels all critical equipment and services (electrical equipment and switch gear, emergency power equipment, major HVAC plant).
- Include space for future energy storage (electrical or thermal batteries).

Design responses

- Utilise a climate responsive design approach, optimise building envelope for passive climate control.
- Rooftop solar PV array sized to run basic systems during the day to maintain minimum systems when there is a utility disruption
- Allow islanding of any on-site generation and standby power circuit to enable limited building operations without utility power.
- Avoidance of gas-fired building systems where possible, or spatial provision for easy replacement with electric heat pumps or other fossil-fuel free equipment at end of service life (20 years) or sooner.
- Green roofs and extensively vegetated public realm to mitigate urban heat island effects and protect against increasing peak temperatures
- Provide areas of operable facade to allow fresh air during power outages
- Flexible layout to allow for changing occupier requirements.
- Daylit fire stairs to allow easy evacuation during power outage.

- Locate above Probable Maximum Flood levels all critical equipment and services (electrical equipment and switch gear, emergency power equipment, major HVAC plant).
- Design all structure below PMF to survive flooding.

Operational opportunities

- Develop Climate Adaptation and Community Resilience plans at the scale of the University, campus, and individual building.

Responds to

- UN SDGs
 - SDG 9 Industry, Innovation and Infrastructure
 - SDG 11 Sustainable Cities and Communities
 - SDG 12 Responsible Consumption and Production
 - SDG 13 Climate Action
- NSW Climate Change Policy Framework
- Pyrmont Peninsula Place Strategy
- Resilient Sydney
- City of Sydney Environmental Strategy 2021-2026
- UTS Sustainability Policy
- UTS Sustainability Strategy
- UTS Sustainable Design Guidelines

Biodiverse Habitat

UTS Sustainability Vision

UTS landscapes will create a new urban quarter of Indigenous ecologies. The central, civic meeting point will be enhanced by its inclusion of the natural world. These green ecologies will also improve the quality of the public realm and its active transportation pathways.

Principles

- Preserve and protect existing natural ecosystems
- Enhance Urban Ecology
- Establish a biophilic environment that provides regular immersion in and contact with nature and natural systems for Precinct workers and visitors.
- Maximise future mature tree canopy and vegetation coverage in public domain.
- Eliminate pollutant discharge into the waterways from wastewater and stormwater.

Targets

- Create a net increase in biodiverse vegetation and useful habitat over existing development.
- Create habitat for flora and fauna indigenous to Ultimo-Pyrmont or otherwise targeted by City of Sydney as ecologically significant.
- Zero habitat for pest fauna species.
- Target 28 per cent green cover with 20 per cent canopy cover.
- Continuous canopy coverage along streets, and pedestrian and bicycle routes where possible.
- Mitigate light and noise pollution impacts on nature.

Planning opportunities

- Vehicle egress and ingress located so as to not interrupt the walk-able nature of the development.
- Surface runoff from hardscapes filtered through landscape treatment before discharging to waterways.
- On-site stormwater detention for heavy rainfall events that delay discharge.
- Protect existing significant trees and remnant vegetation.

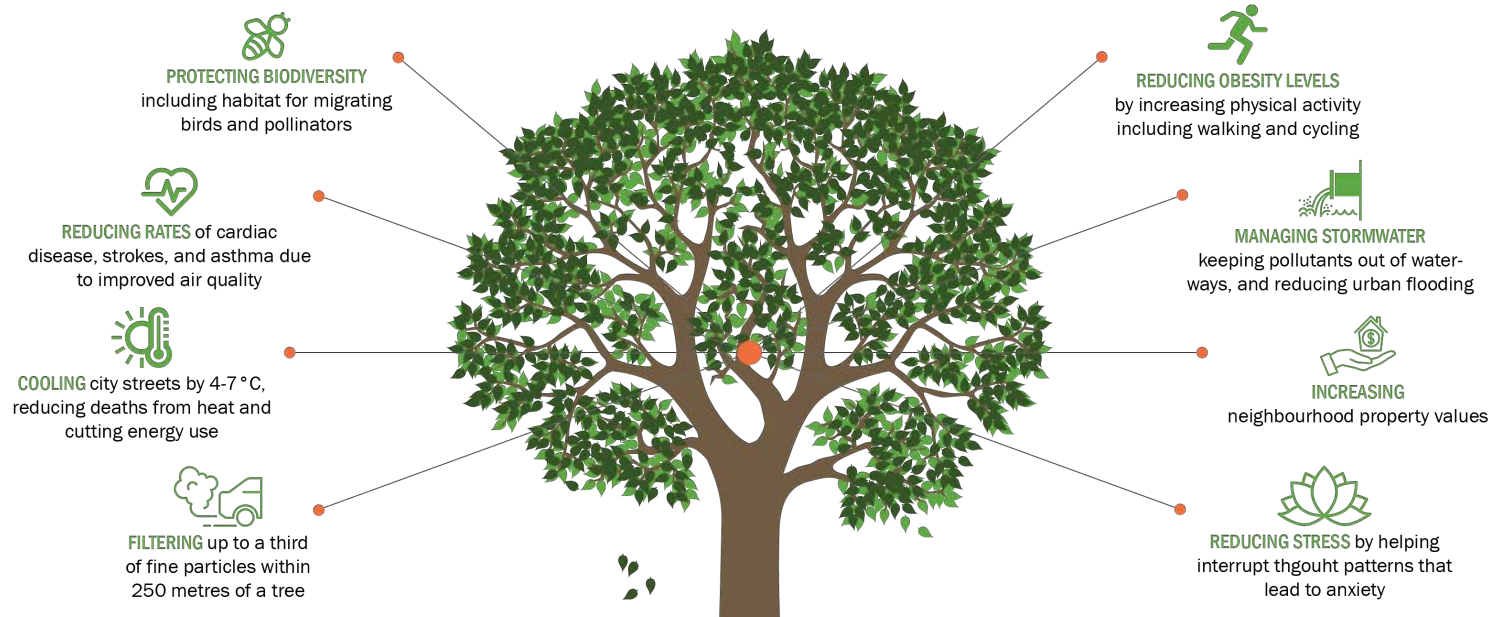


FIGURE 14 – BENEFITS OF URBAN BIODIVERSITY

Design opportunities

- Use plant species native to the Plant Community Type (PCT) which improves chances of attracting local birds and insects to help with the local ecosystem.
- Incorporate locally-sensitive drought tolerant plant species which require little irrigation and maintenance.
- Mimic vertical structure in vegetation layers (stratification) to increase diversity of faunal habitat opportunities.
- Encourage ground water recharge through permeable ground cover.

Operational opportunities

- Purchase biodiversity offsets.
- Investigate opportunities on UTS's rural sites to generate biodiversity credits.

Responds to

- UN SDGs
 - SDG 3 Good Health and Well-being
 - SDG 11 Sustainable Cities and Communities
 - SDG 13 Climate Action
 - SDG 15 Life on Land
- Pyrmont Peninsula Place Strategy
- City of Sydney Environmental Strategy 2021-2026
- City of Sydney, Urban Ecology Strategic Action Plan
- City of Sydney, Greening Sydney Strategy (Draft)
- UTS Sustainability Policy
- UTS Sustainability Strategy
- UTS Sustainable Design Guidelines

Circular Economy

UTS Sustainability Vision

The mixed-use activities combined with the large-scale development of new infrastructure and building construction in the area provide an opportunity to design an industrial ecosystem that cycles resources at high value internally.

Principles

- Built environment accommodates sharing economy practices.
- Built environment enables alternative future uses buildings and landscapes
- Buildings are designed for disassembly and reuse of components.
- Buildings incorporate high percentage of recycled/renewable construction materials and products.
- Construction waste practically eliminated.
- Operational waste separated for recovery and recycling.
- Zero organic waste to landfill.

Targets

- 80% diversion of operational waste from landfill
- No water waste: all waste water is captured for treatment and reuse via separate recycled water supply
- No nutrient waste: all non-edible organic is converted to compost or other higher value products through partnerships with off-site partners
- Zero food-waste: all edible food wastage is directed into existing charitable food distribution systems
- All built environment meets a minimum threshold of circular design principles such as design for disassembly, or recycled/renewable construction materials and products.

Planning opportunities

- Spatial plan that allows for modification, replacement or exchange of different functions over time
- Allocate space to support sharing economy practices like shared home appliances, street library, clothing exchange, food bank.
- Allocate space for on site waste management and processing.
- Allocate space for private growing of food.
- Flexible structural system that can be amplified to permit increased floor weight.

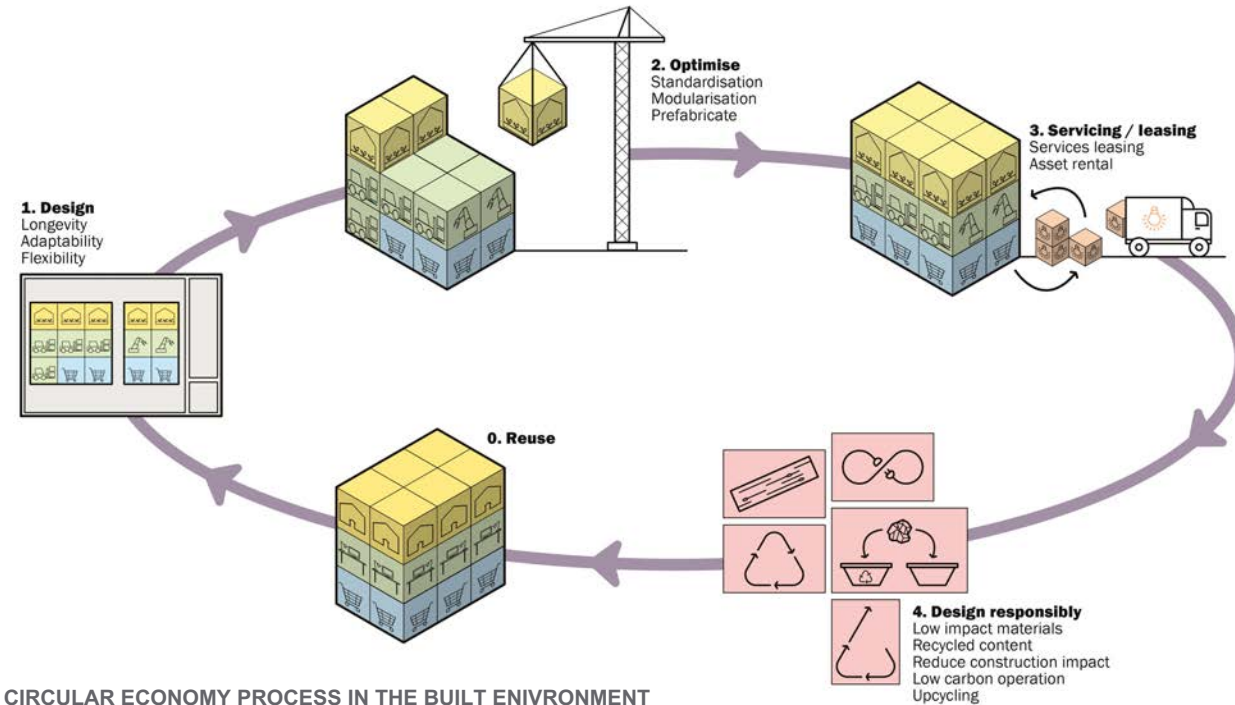


FIGURE 15 – CIRCULAR ECONOMY PROCESS IN THE BUILT ENVIRONMENT

Design opportunities

- Building products and components are passported to facilitate future reuse.
- Buildings designed for disassembly.
- Buildings designed for alternative second- and third-life uses.
- Modular construction of buildings and spatial plan that allows for modification, replacement or exchange of different functions over time.

Operational opportunities

- Implement a procurement standard that includes the purchase of recycled content.
- Mandatory separate collection for all businesses that generate food waste and integration into existing UTS dehydrators system.

Responds to

- UN SDGs
 - SDG 9 Industry, Innovation and Infrastructure
 - SDG 11 Sustainable Cities and Communities
 - SDG 12 Responsible Consumption and Production
 - SDG 13 Climate Action
- NSW Circular Economy Policy Statement: Too Good To Waste
- Pyrmont Peninsula Place Strategy
- City of Sydney, Environmental Strategy 2021-2026
- City of Sydney, Waste strategy and action plan 2017 – 2030
- UTS Sustainability Policy
- UTS Sustainability Strategy
- UTS Sustainable Design Guidelines

Digital UTS Sustainability Vision

The ambition for a sustainable digital UTS is to enhance social and environmental performance and disclosure through emerging digital technology and the internet of things.

Principles

- Identify mandatory disclosure of ongoing performance and assurance of key sustainability objectives with a public interest.
- Identify key performance data for commercial benefit or operational improvement (not for public disclosure).
- Develop physical infrastructure (fibre, Wi-Fi and narrowband) and IOT sensor strategy for mandatory disclosure and for commercially beneficial data.
- Provide a way-finding platform and hub for future mobility interface.
- Develop protocols for privacy, access, data security, educational benefit and civic engagement
- Support the effective implementation of the circular economy.

Targets

- Student, staff and visitor experience enhanced through digitally enabled places and spaces.
- High quality future-proofed ICT infrastructure.
- Built environment resource flows are tracked digitally in real time.
- Natural resource flows are tracked digitally in real-time.

Planning opportunities

- Multiple diverse points of entry enable diverse routes for incoming service provider cabling.
- Number and size of the incoming communications ducts ensure the building is able to meet current and future tenants' connectivity needs.
- Incorporate dedicated, secure and climate controlled space for service provider equipment to be located, reducing the risk of overheating and malfunction.
- Telco room design is appropriately sized to meet the requirements of the residents.
- Protected communications risers support diversity and protect against potential service disruption.

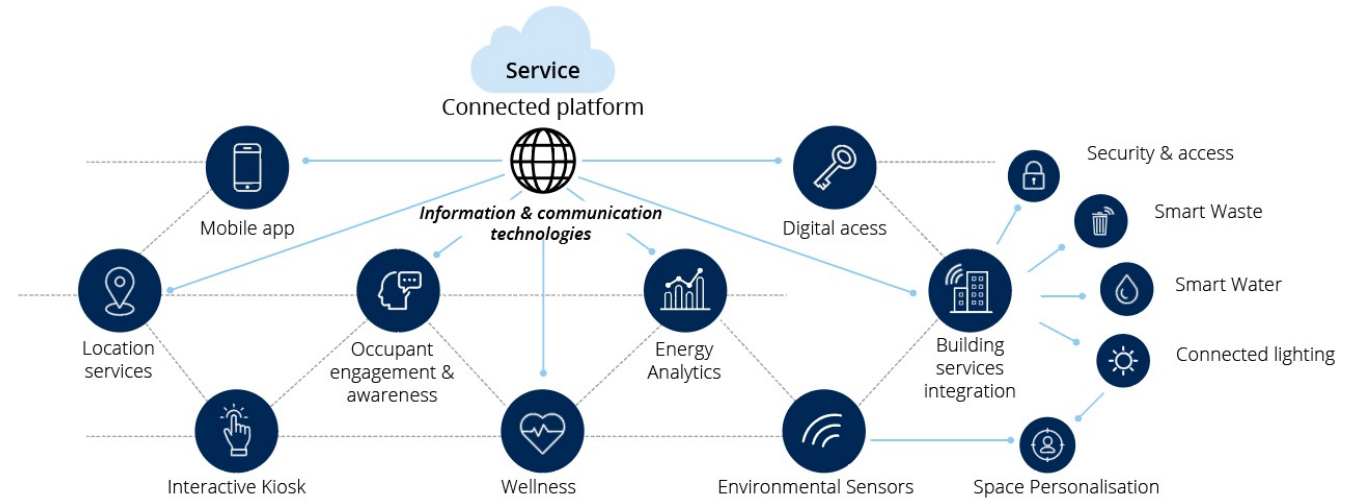


FIGURE 16 – DIGITAL PLATFORM CONCEPT SCHEMATIC

Design opportunities

- 100% fibre network.
- 100% WiFi coverage.
- Provision in building designs for future integration of an in-building mobile signal solution.
- Sensing, monitoring and control of:
 - Mobility (bicycle parking, MaaS availability, curb space, deliveries)
 - Utilities (energy, ICT, water, lighting)
 - Public realm (occupancy detection, cleanliness, security)
 - Environment (air quality, temperature, humidity, stormwater, ventilation)
 - Waste (quantity, quality, location)
- Support mobile working with frequent interior and exterior GPOs, charge stations, and a variety of spaces for individual and collaborative working - "I" and "we" spaces.
- Dynamic digital displays situated throughout building and public domain to communicate building, university and contextual information (e.g. events, amenities, accessibility options, transit timetables, directions, weather and environmental conditions).
- Ability to add sensors throughout spaces targeted for investigation by potential Living Lab opportunities.

Operational opportunities

- Coordinated digital twin development.
- Develop a single digital platform for data management, monitoring and disclosure of environmental performance.
- Build a digital engineering framework for consideration of sustainability improvements over design and tracking of operational data.

Responds to

- UN SDGs
 - SDG 9 Industry, Innovation and Infrastructure
 - SDG 11 Sustainable Cities and Communities
 - SDG 12 Responsible Consumption and Production
- Commonwealth Government, Smart Cities Plan
- NSW Government, Tech Central
- City of Sydney, Digital Strategy
- City of Sydney, Tech Startups Action Plan
- UTS Sustainability Policy
- UTS Sustainability Strategy
- UTS Sustainable Design Guidelines

Enhanced Mobility

UTS Sustainability Vision

The success of the campus will depend on diverse, flexible, and connected mobility options for both goods and people, that is adaptable to future transport systems.

Principles

- Active personal transportation is the most convenient option for short trips around campus and to nearby destinations.
- Efficient, reliable and easy-to-understand public transportation serves most regular trips, and a substantial share of visitor trips, to and from the precinct.
- Diverse micromobility options.
- Car-free zones.

Targets

- Legible wayfinding system for seamless connectivity between UTS campus buildings, local places of interest, and other forms of transport
- Integration of, and consideration for future mobility-as-a-service (MaaS) operators.

Planning responses

- Attractive high quality end of trip (EOT) facilities to facilitate and encourage active mobility.
- Safe, convenient and attractive 24/7/365 access to additional EOT facilities in adjacent Building 8.
- Micromobility station areas located in close proximity to building entrances with passive surveillance and charging capacity.
- Pedestrian friendly accessible through site off-street link to The Goods Line.
- Loading dock entry that does not interrupt valuable pedestrianised public domain.

Design Responses

- Micromobility station areas located in close proximity to building entrances
- Extensive high-quality end of trip (EOT) facilities to encourage active personal transport, including charging of electrified micromobility (e-bikes, e-scooters, etc.)
- Explore integration of car share parking for MaaS operators (e.g. GoGet)

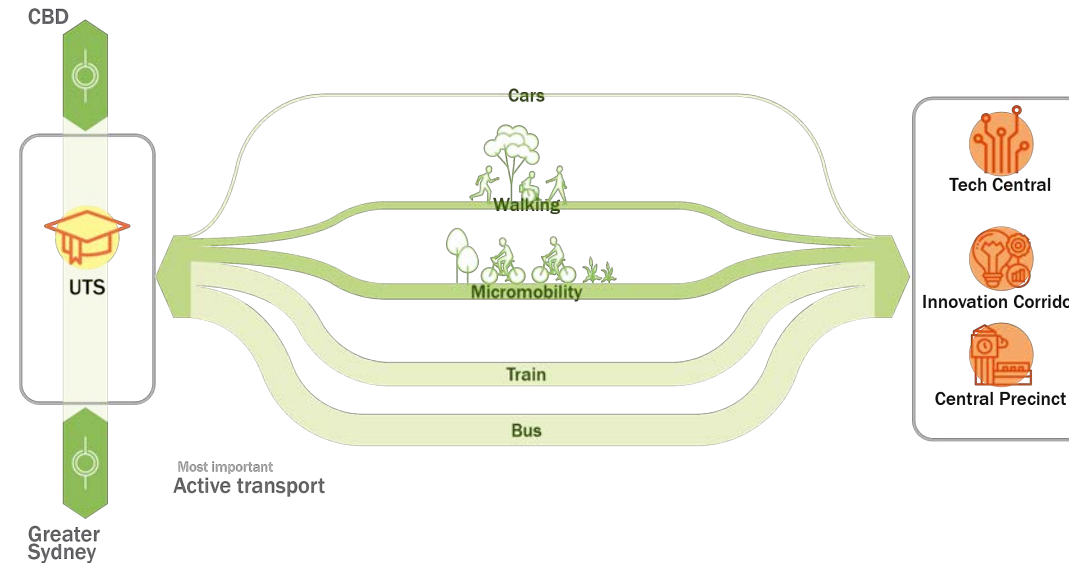


FIGURE 17 – DIVERSE MOBILITY STRATEGY

- Parking to have charging capacity in line with best practice expectations (including number of spaces, charging speed, monitoring)
- All buildings accessible by pedestrian routes and bicycle paths
- Digital IoT network to support live system status:
 - Parking spaces available
 - Charging progress
 - Share bike/scooters available and location
 - Ride share pick-up / drop-off (PUDO) bays
 - Transit timetable and status

Operational opportunities

- Electrification of all university owned and operated transportation (cars, shuttle buses, etc.)
- Partnerships with MaaS operators which provide free or discounted rates for students and staff (GoGet, Lime, Uber)

Responds to

- UN SDGs
 - SDG 3 Good Health and Well-being
 - SDG 9 Industry, Innovation and Infrastructure
 - SDG 11 Sustainable Cities and Communities
 - SDG 13 Climate Action
- Commonwealth Government, Smart Cities Plan
- NSW Future Transport Strategy
- City of Sydney, Environmental Strategy 2021-2026
- City of Sydney, Walking Strategy and Action Plan
- UTS Sustainability Policy
- UTS Sustainability Strategy
- UTS Sustainable Design Guidelines
- UTS Sustainable Transport Plan

Zero Water Waste

UTS Sustainability Vision

Infuse the campus with water and celebrate precious water resources through a well-worn hierarchy of reduction, efficiency, capture and reuse.

Principles

- Contribute to the regeneration of the water shed.
- Celebrate water as a resource and defining elements of the Pymont Peninsula.
- Use water to create a better and more natural experience.
- Use potable water only for potable needs.
- Capture and store rainwater on site.
- Reuse water where practical.

Targets

- Create a sustainable and water efficient design
- Revitalise water as an amenity and experiential connector.
- Capture rainwater from all non-trafficable roof surfaces .
- Reuse harvested rainwater for landscape irrigation and other non-potable uses.
- Reduce potable water demand by about 40%.
- Maintain a total water cycle balance through a circular economy structure that minimises nutrient discharge into the waterways from wastewater and stormwater.

Planning responses

- Install rainwater capture tank sized to retain a substantial volume of water for irrigation, toilet flushing and other non-potable uses.
- Water sensitive urban design (WSUD) including permeable surfaces and swales to maximise local infiltration and reduce run off.
- Green roofs designed to reduce peak rainwater runoff.
- On-site stormwater detention for heavy rainfall events that delay discharge.
- Connect to existing recycled water networks where possible.
- Separate purple pipe for non-potable utility connection.

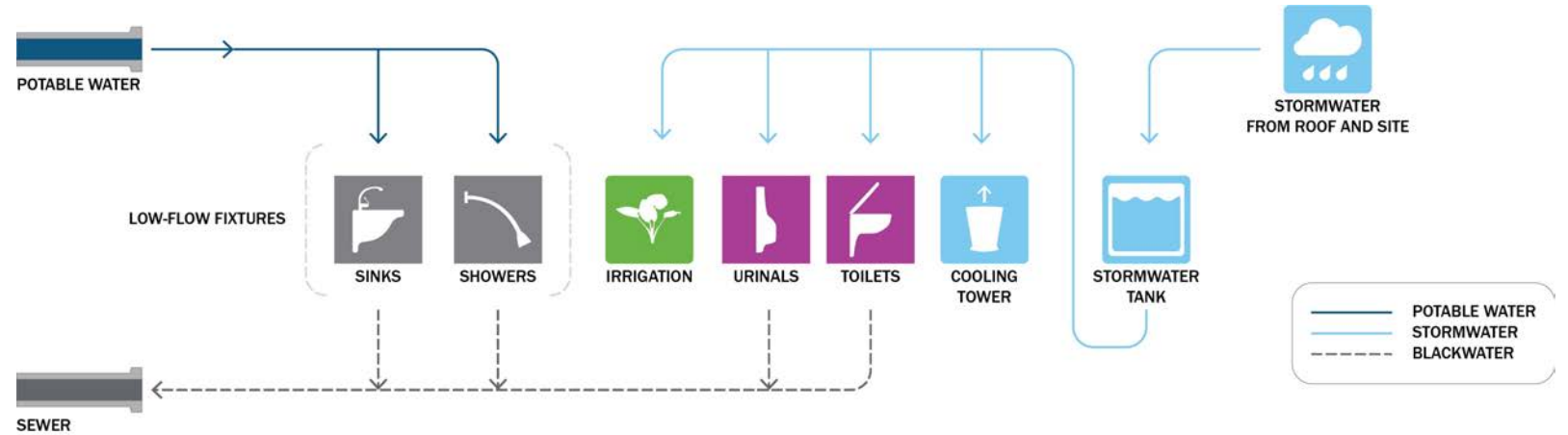


FIGURE 18 – UTS WATER STORY

Design responses

- Conscious shaping of water as a dynamic landscape element.
- Universally accessible drinking water fountains, with water bottle filling, are available in all public spaces.
- Minimise potable water use through efficient fixtures and fittings.
- Provide water leak detection systems and report to BMS.
- Irrigators and other soil monitoring control irrigation.
- Water channels, swales, and other landscape features retain stormwater for infiltration.
- Direct fire pump test water back to fire storage or rainwater tank.
- Connect to existing recycled water networks where possible.

Operational opportunities

- Monitoring of incoming and outgoing water quality and quantity.

Responds to

- UN SDGs
 - SDG 3 Good Health and Well-being
 - SDG 6 Clean Water and Sanitation
 - SDG 11 Sustainable Cities and Communities
 - SDG 12 Responsible Consumption and Production
 - SDG 13 Climate Action
 - SDG 14 Life Below Water
- Commonwealth Government, Smart Cities Plan
- NSW Climate Change Policy Framework
- City of Sydney, Environmental Strategy 2021-2026
- Resilient Sydney
- UTS Sustainability Policy
- UTS Sustainability Strategy
- UTS Sustainable Design Guidelines

Assurance

Rating Tools Assurance

It is imperative that sustainability objectives are backed up by an approach to assurance that gives absolute confidence that the claimed outcomes will be achieved. This requires a framework for assurance that covers the sustainability objectives and provides:

- independent review
- transparency of methodology
- accountability at each phase of the lifecycle

The benefits of using existing tools are the capacity to benchmark the project against national and global peers, and also provide certainty for industry participants through the planning, procurement and delivery processes.

UTS has now enshrined their use in their forthcoming updated Sustainability Strategy requiring that all 'new UTS buildings and substantial refurbishments must achieve a minimum 5 Star Green Star certified rating.'

The Indigenous Residential College (IRC) project at the Buildings 13-15 site has already deviated from this, instead opting for WELL certification. The response from consent authorities will give greater insight into their expectations for UTS buildings in the Pyrmont-Ultimo area. It is possible though that the University's approach to sustainability certification may need to be more nuanced.

This report suggests that a flexible assurance framework be developed based on the outcomes of the IRC planning application discussion with the City of Sydney which considers proposed building use types and potential future adaptations.

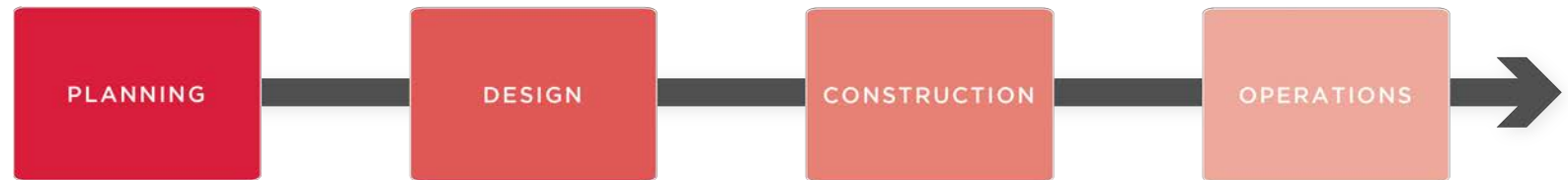
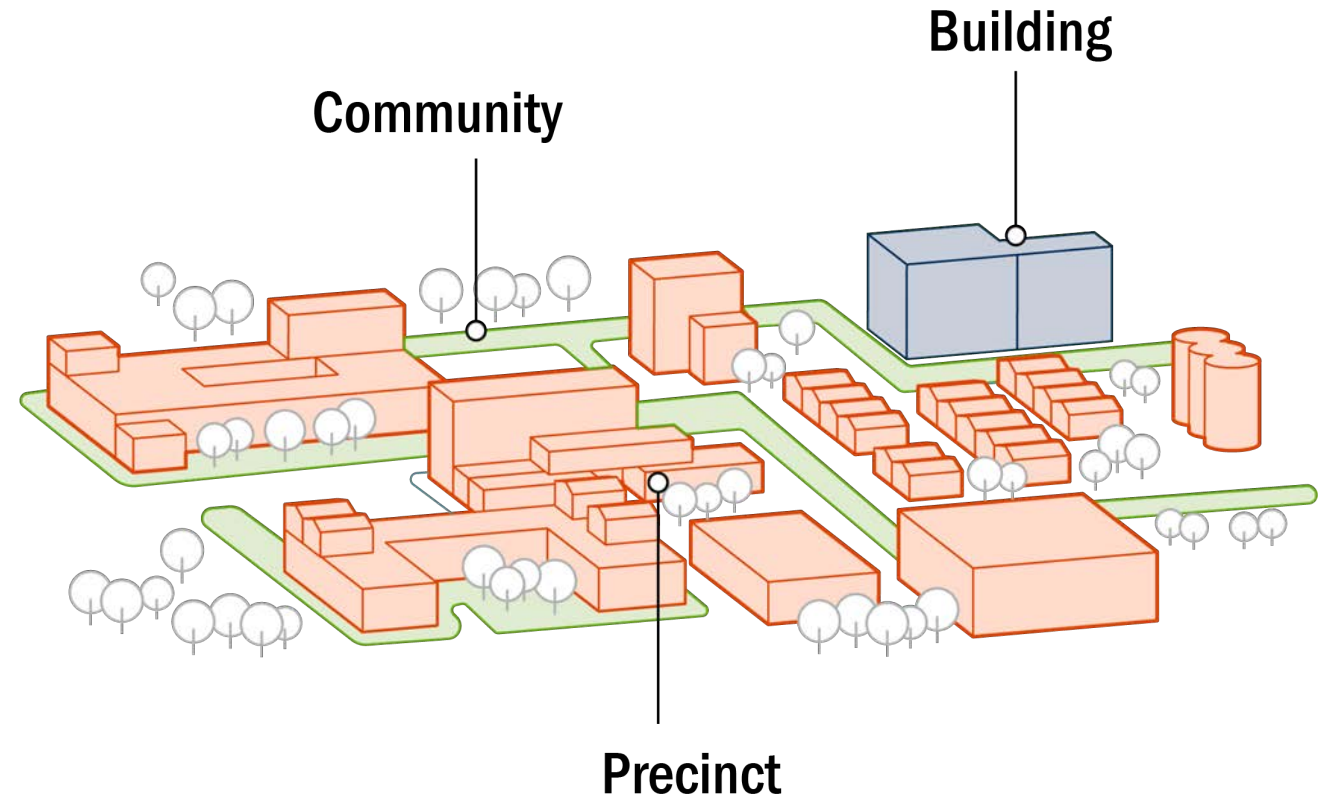


FIGURE 19 – ASSURANCE CONSIDERATIONS

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