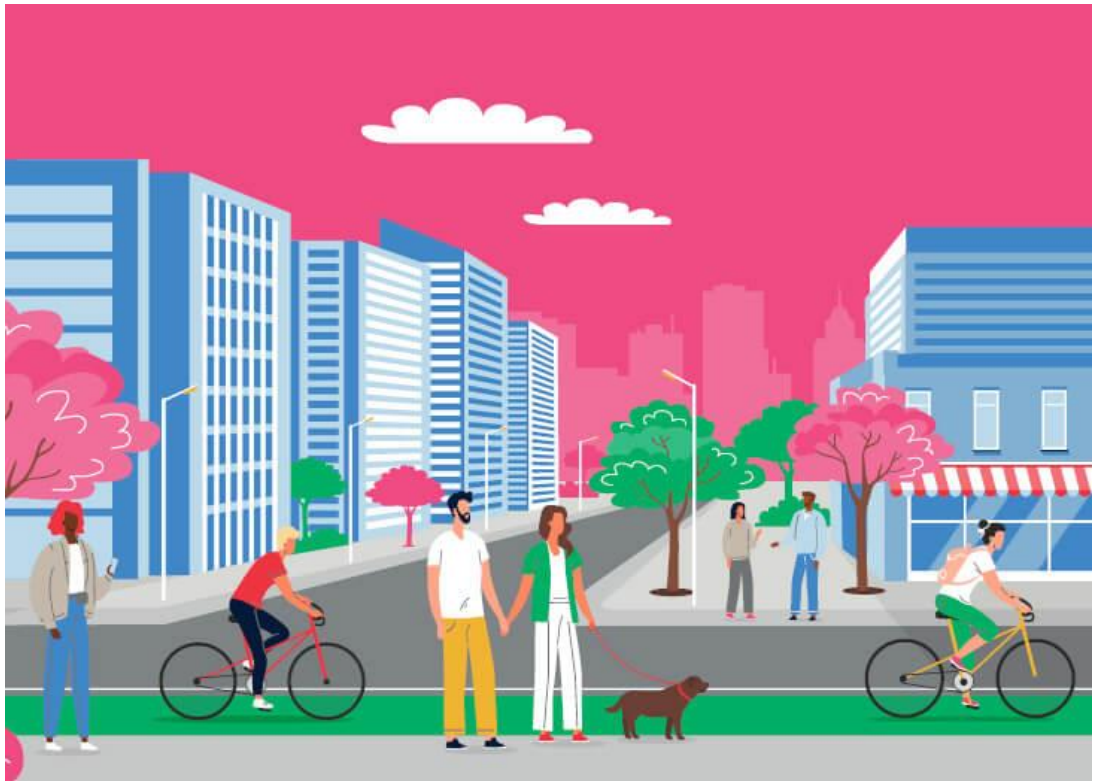
Cumberland City Council

Westmead South Masterplan ESD Options Paper



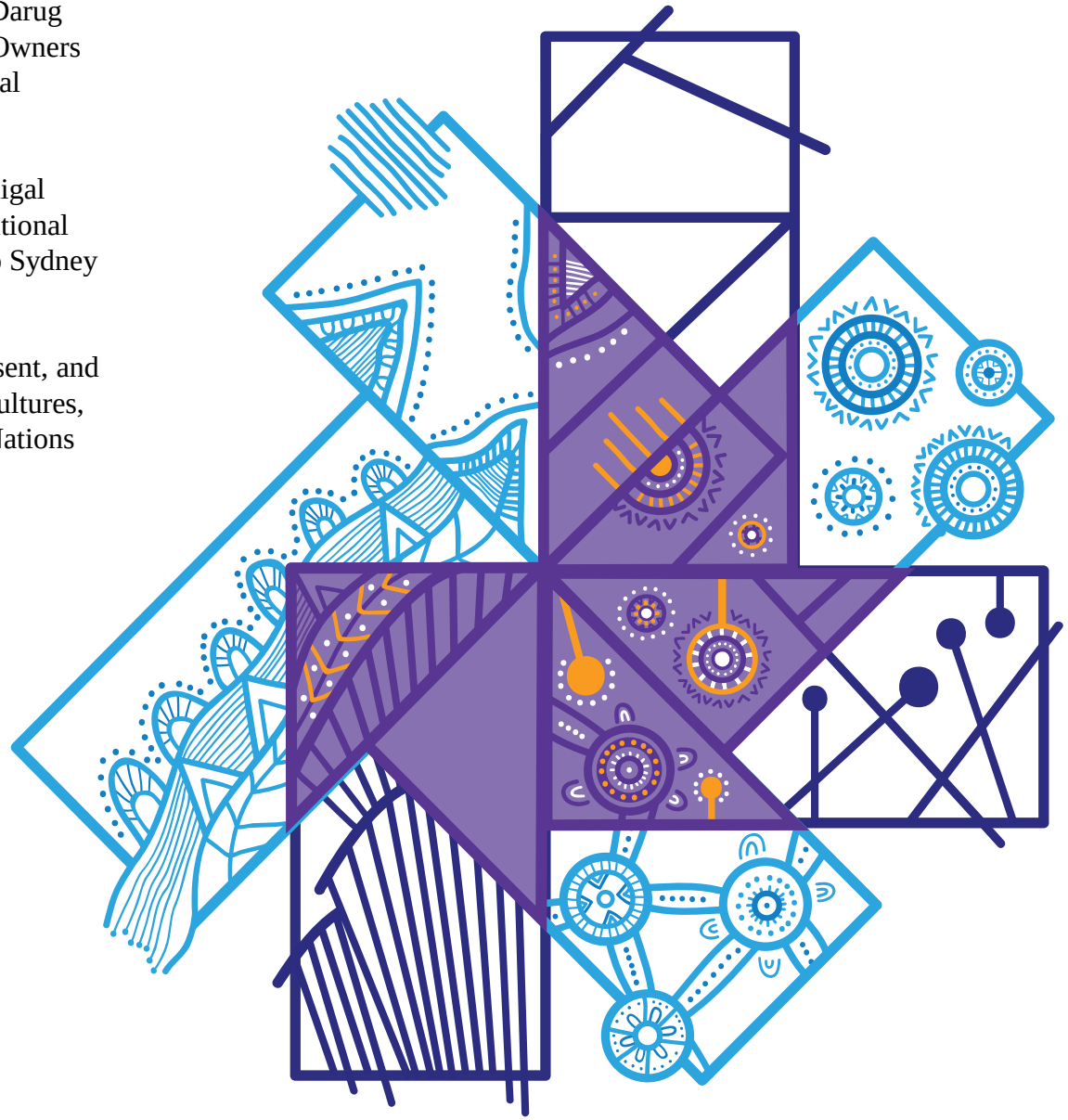
Version 1.0

2023-10-24

Arup would like to acknowledge the Darug Nation and People as the Traditional Owners of the land on which Cumberland Local Government Area is situated.

We also wish to acknowledge the Gadigal people of the Eora Nation as the Traditional Owners of the land on which the Arup Sydney office is located.

We pay respect to Elders past and present, and recognise and celebrate the ongoing cultures, traditions and custodianship of First Nations peoples.



The artwork is *Shift to shape an even better world* by Gilimbaa Artist Tarni O'Shea.

Document Verification

Project title	Westmead South Masterplan ESD Consultancy
Document title	ESD Options Paper
Job number	296694-00
Document ref	ESD-REP-01
File reference	ESD

Revision Version 1.0	**Date** 24 Oct 2023	**Filename**	Westmead South - ESD Options Paper_Issue 20231024
		Description	ESD Options Report Version 1.0. Updated based on client's comments

	Prepared by	**Checked by**	**Approved by**
Name	Derian Pereda	Alexander Hespe	Jo Walton-Hespe
Signature			

ARUP

Introduction

Introduction

Intent

Arup have been commissioned by Cumberland City Council to provide Ecologically Sustainable Development (ESD) advice for the Westmead South Masterplan. This document represents the *ESD Options Paper* deliverable as part of the agreed program. It presents the refined outputs of the sustainability workshop held on 31st August 2023. The outputs are proposed to contribute to the sustainability aspirations of the Westmead South Masterplan. The subsequent list of sustainability initiatives and benchmarks presented will support the realisation of these aspirations.

To inform the ESD options described in further sections, Arup undertook policy and planning controls research to identify key constraints, organised an ESD workshop between key stakeholders to identify key aspirations. Follow this, the team leveraged in-house technical expertise to devise pertinent initiatives and associated implementation requirements. It is noted that policy research and workshop outcomes have been presented as standalone documents, as per the agreed program.

Westmead South Masterplan

Overview

Westmead South is a key centre of Cumberland City, located in the southern portion of the Westmead Precinct, 1.7km from the Parramatta Business District. It is bound to the north by a railway corridor, south by the Great Western Highway, east by the Mays Hill Precinct (Parramatta Park), and west by Bridge Road.

The Westmead Precinct is in the Central River City, one of Greater Sydney's three cities. It is poised to transform, with significant infrastructure investment including a future Metro station at Westmead, Parramatta Light Rail, rapid growth in health, education and innovation, and potential connection of the North-West T-way with the Liverpool-Parramatta T-way via Westmead South.

The precinct is expected to provide residents increased employment, services and recreation opportunities within 30 minutes. Westmead South is a gateway to the Westmead Precinct, the masterplan is well placed to provide specialised retail and commercial uses and diverse housing opportunities.

Figure 1. Westmead South context map

Workshop results

The ESD Options Workshop was held on the 31st of August 2023 between relevant stakeholders, consultants and designers to explore key sustainability aspirations and constraints surrounding the masterplan.

The intent of the workshop was to capture blue-sky aspirations in order to depict Westmead South's sustainability vision. Consideration was also given to current barriers and challenges that will likely impede achieving this vision.

Participants' aspirations were captured, arranged under recurring themes, and summarised in the tables below. It is noted that participants' input was synthesised for presentation purposes, however the essence remains intact.

Workshop results

 **Energy, Thermal Comfort & Carbon**	• An exemplar in sustainability • Opportunity to set the standard • Net zero • An equitable approach to urban heat • Passive water, energy and thermal systems • Develop framework to address embodied carbon • Contribute to Australia and NSW's net zero target	 **Landscape & Public Realm & Biodiversity**	• Resilient • Equitable • Increase biodiversity • Endemic plants • Positive contribution to water and natural systems • Maximise deep soil to enable bigger trees • Synergise with historic landscape • Connection with Parramatta Park • Maximise canopy shade
 **Movement and transport**	• Walkable • 30-minutes city • Employment opportunities and services within reach • Human – friendly	 **Smart City**	• Smart strategy • Provisioning for future tech (energy connection, space provisioning, infrastructure) • Smart technology for climate hazard preparation: demand side management, virtual power plant, etc. • Virtual batteries, local grid. • Exemplar – Campbelltown DCP
 **Community**	• Cohesive • Social • First Nations component in design • Affordable • Safe • Clean, comfortable • Land rezoning to maximise community benefits	 **Water**	• Apply water-sensitive urban design (WSUD) strategies • Align flooding areas with landscape requirements

Table 1. Aspirations captured in ESD Options Workshop

Workshop results

 **Challenges**	- Physical barrier in master plan - Limited open space - Lots of streets - Urban heat island effect - Flooding - Understanding net zero concept - Getting council onboard - Current SEPP and DCP requirements

Table 2. Barriers captured in ESD Options Workshop

Themes

Themes

This section outlines the key themes that should be considered for the Westmead South Masterplan. The basis of this recommendation is to ensure alignment with broader federal and state emissions reductions and overall sustainability targets, and to position Westmead South as a role model for sustainability in the Cumberland area.

The themes presented in this section build upon key aspirations uncovered in the ESD Workshop. It is noted that themes which weren't discussed in the workshop but hold critical importance, such as waste, have been incorporated in this section.

Energy, thermal comfort, and carbon

The vision for Westmead South is to gradually be a net zero Precinct, that understands its emissions sources and develops strategies to drive emissions reductions within its boundary of influence.

Westmead South's impact on energy consumption and greenhouse gas emissions is influenced by two main factors: operational emissions and embodied emissions.

Operational emissions

Operational emissions refer to the direct emissions arising from the precinct's operational use throughout its lifecycle (commonly referred to as Scope 1 and 2 Emissions). The total amount of operational emissions generated is dependent on fuel source, energy intensive requirements such as space conditioning and ventilation, energy efficiencies, technological advancements, and human behaviours.

In addition, a precinct also generates indirect operational emissions (commonly referred to as Scope 3 Emissions) as it produces waste, uses water, provides transport options, and consumer goods. The associated emissions with these are also included in a precinct's operational greenhouse gas emission profile.

Embodied emissions

Embodied emissions refer to the greenhouse gas emissions generated during construction, refurbishments, and demolition phases, and includes emissions generated during material extraction, manufacturing, transport, and disposal. The vast majority of embodied emissions occur at the 'before use' stage. The State Environmental Planning Policy (Sustainable Buildings) 2022, also known as the *Sustainable Buildings SEPP* requires new non-residential buildings to measure and report embodied carbon emissions from October 2023 onwards.

Energy, thermal comfort, and carbon

Embodied emissions

The circular economy framework below, illustrates key principles to minimise the level of embodied emissions in the Precinct (see Figure 2).

During the construction of the precinct, various materials such as concrete, steel, aluminum, asphalt, timber, and others will be used. At early design stages, choices are available to consider material switching, durability or low emission options.

Strategies can include measuring and reducing upfront carbon emissions, prioritising the retainment of existing structures where possible, minimising waste in design, building for longevity, flexibility and adaptability, material selection, and tailored procurement processes.

For Westmead South, circular economy strategies that address embodied carbon emissions can include:

- Prioritise retainment of existing structures, where possible.
- Promote use of local materials to reduce transport emissions.
- Promote use of natural materials, such as timber
- Consider modular off-site construction systems.
- Innovating product design for longevity, re-use, remanufacture and resource recovery.
- Minimising the inefficient use of virgin materials
- The use of concrete (including pre-cast) clinker substitutes
- Waste to landfill diversion targets (construction and demolition)
- Contractors and sub-contractors environmental management policies and procedures, such as ISO14001 accreditation.
- Monitoring and modelling of materials lifecycle impacts and embodied emissions.

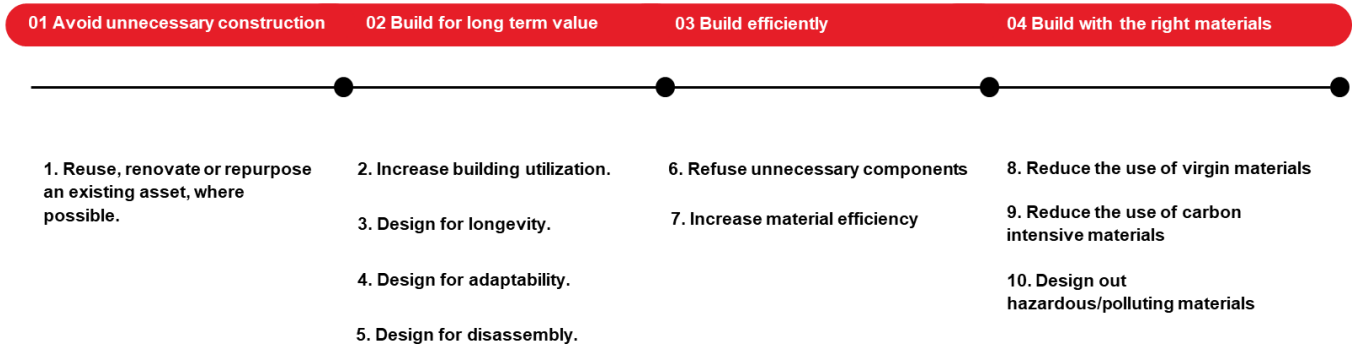


Figure 2. Circular economy framework (Arup, 2023)

Energy, thermal comfort, and carbon

Operational emissions

Operational emissions present significant potential to be controlled and minimised in Westmead South. This section highlights some of the key metrics in assessing energy and the result carbon emissions.

Firstly it is important to note the classification of operational emissions.

Scope 1: Emissions arising from on-site consumption of fossil fuels, on-site disposal of waste, and on-site release of refrigerant gasses. On-site consumption of fossil fuels includes from diesel generators, gas cooktops, gas domestic hot water heaters, and boilers.

Scope 2: Emissions arising from electricity supplied to site, for consumption within the precinct in operation. Major electricity demands at a precinct level include space conditioning (heating, cooling) and ventilation, lighting, water heating, heavy appliances, and pools.

By setting boundaries or requirements on the source of these emissions, the masterplan and DCP can significantly reduce Westmead South's emissions in operation. Furthermore, a suite of strategies can be implemented in the Precinct to minimise operational emissions

The following items look at operational emissions at a building level. These are equally applicable to council assets and proposed developments as part of the masterplan. Opportunities exist to either mandate or encourage adoption of these features through the development of the masterplan.

100% electric precinct

Electricity represents the only potential fully renewable, distributed energy source.

- Consider opportunities to transition towards the use of 100% electricity on-site, including the exclusion of a connection to the gas network. Aligns with *NSW's Net Zero Plan Stage 1: 2020–2030* targets and *Green Star Building's* requirements and tuning or rectified and assist in prioritising retrofit actions.
- Use automated systems connected to a Building Management System (BMS) where possible, such as lighting control that includes occupant detection and daylight adjustment.
- Integrate design features and technologies that support peak demand shifting and energy storage, helping shift demand away from both network peaks (resilience / cost) and fossil peaks (carbon intensity / baseload).

Renewable energy – Purchasing options

- The precinct has two options for procurement of offsite renewable energy: power-purchase agreement or similar with a centralised energy provider, or separate procurement for each building.

Renewable energy – On-site generation

- Maximises solar photovoltaics (PVs), wind, and geothermal renewable energy sources

Energy, thermal comfort, and carbon

Operational emissions

Operational emissions associated with residential development will be a significant component of the overall precinct emissions. As a building typology, there are many regulatory and voluntary standards that can be applied to reduce residential operational emissions.

Reducing residential energy demand

- Target industry best-practice energy ratings for efficiency and energy consumption, exceeding the minimum requirements for NCC Section J, BASIX and NatHERS. For Class 2 residential buildings, *Green Star Buildings* includes Credit 22 *Energy Use – Residential Pathway*, with defined minimum performance criteria and exceptional performance criteria for major areas of residential energy demand.
- Prioritise passive design measures for all buildings, including optimised orientation, taking advantage of natural wind movements, ambient lighting, shading devices, appropriate window to wall ratios (WWR), and using high performance insulation and glazing to reduce overall energy consumption.
- Require energy meters be installed for all end uses likely to constitute ≥10% of total annual energy consumption in the building (e.g., heating, cooling, ventilation fans, domestic hot water (DHW), lighting, vertical transport). This enables system inefficiencies to be identified and tuning or rectified and assist in prioritising retrofit actions.
- Use automated systems connected to a Building Management System (BMS) where possible, such as lighting control that includes occupant detection and daylight adjustment.
- Integrate design features and technologies that support peak demand shifting and energy storage, helping shift demand away from both network peaks (resilience / cost) and fossil peaks (carbon intensity / baseload).

Waste

The vision for the Westmead South Masterplan is to devise and implement waste management strategies that reduce waste going to landfill, maximise resource recovery, and minimise associated greenhouse gas emissions. In comparable local government jurisdictions, waste can be as much as 8% of the total greenhouse gas emissions of the council. Waste sources within the Cumberland Local Government Area (LGA) are domestic or operational waste, and demolition and construction waste.

Demolition and construction waste

To achieve maximum resource recovery and minimise waste, it is essential to identify opportunities to reduce resource consumption throughout the entire lifecycle of the Precinct, from design and construction to operations. This will require careful consideration of material consumption and waste reduction solutions.

Building on the circular economy framework, existing structures should be retained, and construction and demolition waste reused, where possible.

The graphic inset illustrates major demolition and construction waste streams expected for Westmead South, and identifies whether the material is suitable for reuse, recycling or landfill. Waste streams which are predicted to be the largest in volume are highlighted in pink.

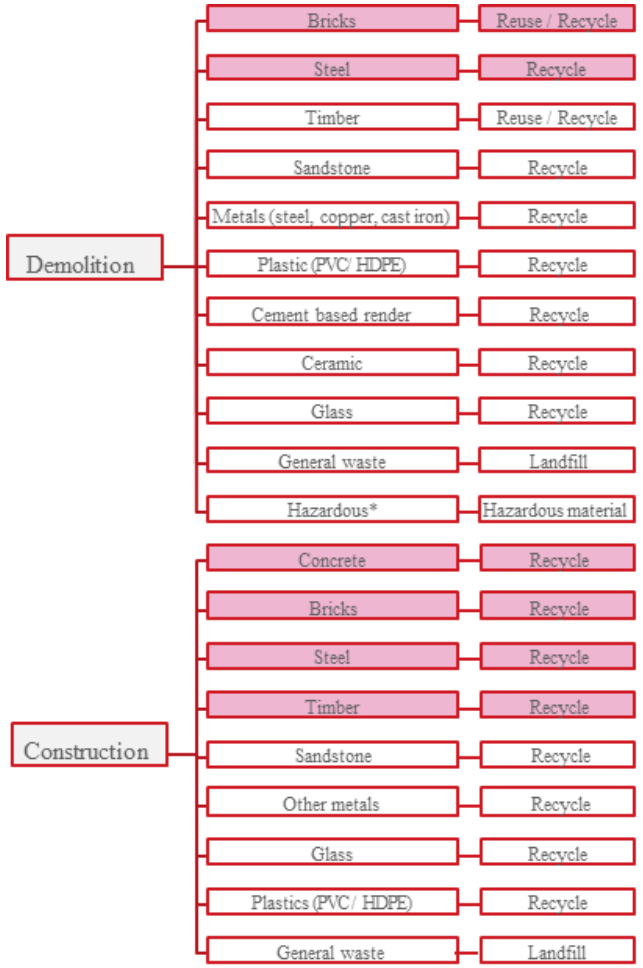


Figure 3. Overview of major construction waste streams expected in Westmead South

Waste

Operational waste

Households within the Cumberland LGA generate around 80,000 tonnes of domestic waste annually, with roughly half of this waste ending up in landfills.[1]

The management of waste, especially organic waste, can result in significant emissions reductions. By acknowledging the worth of waste, optimising recycling efforts, encouraging landfill diversion, and improving collection efficiency, Westmead South can effectively decrease emissions associated with waste.

Exploring new technologies and initiatives on a Precinct-level, such as converting waste into energy, can have a significant impact on promoting positive change.

Furthermore, can better enable natural system regeneration, keep products and materials in use for longer, and better capture and recognise waste as a valuable commodity.

Initiatives may include:

- Applying circular economy principles to materials and recognising waste as a potentially valuable commodity
- Designing waste systems to enable effective material (waste) separation, storage, and export
- Separating organic waste streams to be managed separately to minimise methane release through composting or energy generation
- Provisioning accessible facilities for e-waste collection

1. Cumberland Council (2018), Cumberland Waste and Resource Recovery Strategy 2018 - 2023.

Landscape, public realm, and biodiversity

The vision for the Westmead South Masterplan is to be a nature positive and resilient Precinct, so that its inhabitants can reconnect with historic local ecosystems and reap the benefits of nature.

Green infrastructure

The design and provision of green infrastructure unlocks new areas of green coverage and provide multiple benefits such as social, wellbeing and increased resilience to increasing urban heat island effects. Strategies include:

- Green facades
- Extensive and intensive green roofs
- Bio-solar green roofs (i.e., maximise PV solar uptake)
- Bioswale
- Pocket habitats

Resilience

Landscape design and planning, public realm works, and biodiversity enhancement all hold significant opportunity to improve the resilience of the precinct to acute shocks and chronic stresses, including those arising from climate change, nature losses, and transitional risks.

For a suite of design and operational adaptations that may be implemented to improve Westmead South's climate change resilience, please refer to the Resilience Plan that accompanies this Report.

Figure 4. Pocket habitat developed by Arup

Smart City

The Cumberland City Council's *Smart Places Strategy and Action Plan 2023* identifies key smart technologies opportunities. This section builds on such opportunities, further highlighting the associated emissions reduction potential and community benefits.

Community Batteries

Community batteries are grid-connected energy storage systems that store excess solar energy for households to use during peak hours, with power capacities of up to 5MW. They can provide benefits such as reduced energy costs, increased grid resilience, and reduced inequalities by being accessible to households without a current solar PV system. Shared storage and community energy initiatives have garnered significant attention in Australia, with a broad range of stakeholders, including industry, government, and the wider community, expressing keen interest. Various community battery projects are being trialed throughout Australia.

Virtual Power Plants

Allows for a decentralised system of energy production. The system essentially works as a standalone grid. Given the scale of the Precinct, this allows for a variety of energy producing methods, from PV systems to traditional heat pumps. The use of monitoring technology to bring these systems together also allows for finer control over power production, which can address demand peaks quickly and efficiently. It is noted that proper cost and feasibility analysis must be conducted to assess the suitability of this technology.

Opportunities exist to work with large energy users/generators to integrate into holistic energy masterplan.

Intelligent Building Management Systems (BMS)

Intelligent BMS optimise total building's performance and allow users to track utilities' consumption data on real team, which ultimately enable rapid adaptive responses, reduced energy consumption and associated carbon emissions. BMS look beyond the building equipment, is responsive to the smart power grid, and interacts with the building operators and its occupants.

Digital tree planting and urban heat-island effect monitoring.

Cumberland City Council is committed to investigating innovative ways to monitor tree planting and areas of urban heat. At present, a range of digital resources exist that are capable of mapping green areas in urban spaces and conducting evaluations of heat island effect. For instance, Urban Monitor™, developed by CSIRO, combines land cover statistic with spatial data, enabling local authorities to pinpoint areas where trees are being lost and where they should be replanted based on robust, data-driven insights.

Figure 5. Residential virtual power plant (Arup, 2019)

Water

The vision for the Westmead South Masterplan is to explore and implement integrated water management strategies that drive water efficiency and regeneration outcomes across the precinct. To enable this, initiatives have been proposed that look at reducing on-site demand, increasing recycled water, reusing stormwater, and protecting local waterways.

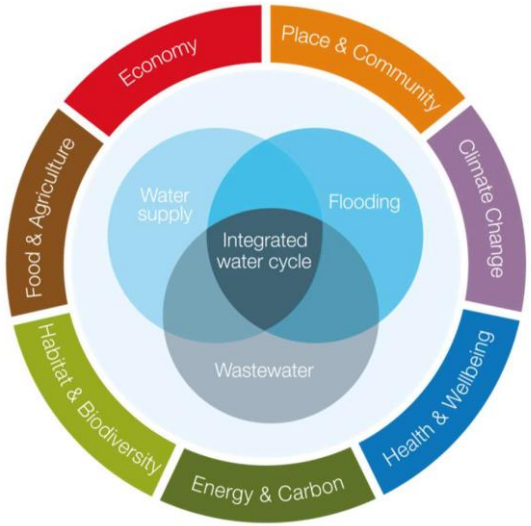


Figure 7. Integrated water management approach

Water Sensitive Urban Design

WSUD relates to all parts of the urban water cycle and involves improvements in town planning, engineering design, asset management, urban landscaping, and urban water management. Therefore, it requires an integrated water management approach that enables collaboration between government, water authorities, regulators, infrastructure providers, business, local, including Aboriginal communities, and others.

At a high-level, strategies should aim to:

- Minimising water consumption and wastewater generation through water efficient planning, design, construction, and operation
- Maximising opportunities for onsite harvesting, treatment and re-use of rainwater, stormwater, and potentially site generated wastewater
- Managing stormwater quality and quantity through the integration of best practice water sensitive urban design into the site master plan

A set of potential WSUD initiatives for Westmead South have been laid out below, for Cumberland City Council consideration:

- Permeable paving integrated with a bioretention system for stormwater capture
- Rainwater tanks installation for rainwater collection and reuse. Utilise harvested rainwater for toilet flushing and landscape irrigation.
- Water exporting. Export water from a location where a surplus exists to a demand point. Requires cross collaboration approach between stakeholders

Water efficiency (Demand reduction)

To drive a robust water efficiency strategy, it is critical that demand reduction is prioritised. To enable this, the following strategies can be implemented across the Precinct:

- Water fixtures and fittings. Provision of minimum WELS requirements for toilets, urinals, taps, and showerheads.
- Maximise rainwater collection and reuse on individual buildings.
- Incentivise the uptake of smart technologies. For instance, smart tanks allow for real time monitoring and controlling of stormwater tank levels to provide maximum capacity prior to a high-risk rainfall event.

Movement and transport

The vision for Westmead South is to be a highly accessible and interconnected Precinct that incentivises walking and the use of low-carbon transport modes for its inhabitants.

The masterplan should consider reclaiming space from private vehicles, where possible, and prioritising pedestrians, cyclists, and net zero public transport. There are multiple benefits associated with these initiatives such as reduced greenhouse gas emissions, improved resident health and less traffic and associated pollution. It is noted that urban transport decisions must also be inherently linked to land use decisions and urban form planning.

Electric vehicle infrastructure

- Set % allocation of parking spaces to EVs, including provision of EV charging stations.
- 100% provision of electrical conduits to parking spaces in the precinct (street parking and private parking) for future connection and installation of EV charging stations.
- Coordination with grid infrastructure provider to size system (substations) to accommodate future EV charging demands (up to substation end-of-life).

Bicycle parking requirements

- Set % allocation of bicycle parking spaces for building use types, e.g., per resident, per worker, etc. This should include majority bicycle parking in safe, lockable storage locations, e.g., bike racks in safe locations, access-key accessible bike cages, or end-of-trip bike parking, etc. *Green Star Buildings* Credit 27 Movement and Place provides a good standard for precinct buildings to achieve.
- End-of-trip facilities for post-trip amenity, for non-residential buildings.

Private parking

- Minimise private parking in public domain and promoting walkability and cycling.

Public transport

- Design that promotes the use of public transport e.g., public transport accessibility.

Figure 8. Fast charging stations (Arup)

Community, health and wellbeing

The vision for the Westmead South Masterplan is to be vibrant Precinct that features accessible, diverse, and well-connected public spaces and places. The initiatives outline below draw upon this vision and aim to foster liveability and social cohesiveness across the site.

Community wellbeing

- Considers inclusive construction practices such as providing gender inclusive temporary facilities and protective equipment, on-site anti-discrimination policies, and peer support. *Green Star Buildings* Credit 31 Inclusive Construction Practices provides a good standard for precinct buildings to achieve.
- Considers social procurement strategies during construction that generate equal employment opportunities for disadvantaged and under-represented groups. *Green Star Buildings* Credit 33 Procurement and Workforce Inclusion provides a good standard for precinct buildings to achieve.
- Considers inclusive design principles. This includes provisioning for equitable access, diverse wayfinding, and inclusive spaces. *Green Star Buildings* Credit 34 Design for Inclusion provides a good standard for precinct buildings to achieve.
- Establishes a resilience meeting point to providing refuge for locals in the face of extreme weather events.

Connecting with Country

The NSW Government has developed detailed Connecting with Country Framework which sets out an approach for ensuring that development respects and learns from the first nations peoples of Australia.

It is suggested that the engagement of an appropriately qualified consultant to address this topic is crucial.

The council have engaged a specialist consultant to address this.

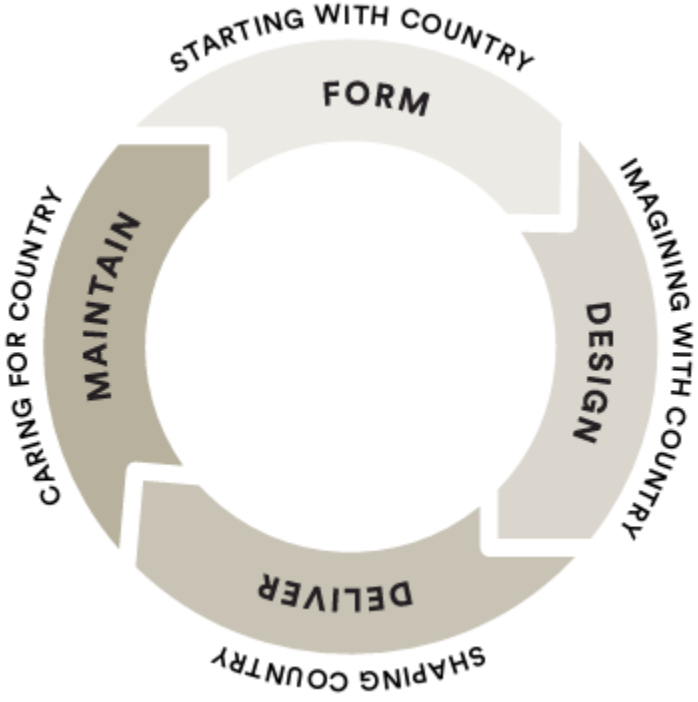


Figure 9. Connecting with Country Draft Framework, NSW Government 2023

Initiatives for consideration

Initiatives for consideration

This section summarises sustainability initiatives discussed in previous sections of the document. It is noted that specific initiatives might change as the Masterplan detailed design progresses. Nevertheless, the design principles that underpin these initiatives should be maintained.

Themes	Data Label	Proposed initiatives
Energy, thermal comfort, and carbon	1	Retention of existing structures.
	2	Procure local and natural materials, such as timber , bamboo, straw, and biocomposites.
	3	Modular off-site construction systems.
	4	Design for longevity, re-use, remanufacture and resource recovery.
	5	ISO14001 for contractors and sub-contractors.
	6	Measure embodied emissions and lifecycle impacts.
	7	100% electric precinct.
	8	Passive design for buildings.
	9	Renewable energy procurement.
	10	Renewable energy on-site generation.
Waste	11	E-waste disposal facilities.
	12	Organic waste separation.
	13	Resource recovery.
Landscape, public realm, and biodiversity	14	Green facades.
	15	Bio-solar and green roofs.
	16	Bioswale.
Smart city	17	Intelligent Building Management Systems (BMS).
	18	Virtual Power Plants.
	19	Community Batteries
	20	Digital tools for assessing urban heat-island effect.

Initiatives for consideration

Continued

Themes	Data Label	Proposed initiatives
Water	20	Water fixtures and fittings.
	21	Rainwater collection.
	22	Smart rainwater tanks.
	23	Permeable paving integrated with bioretention systems.
	24	Utilise harvested rainwater for toilet flushing and landscape irrigation.
	25	Water exporting. Export water from a location where a surplus exists to a demand point.
Movement and transport	26	Electric vehicles infrastructure.
	27	Bicycle parking requirements.
	28	Promote walkability and cycling.
Community, health and wellbeing	29	Inclusive construction practices.
	30	Social procurement strategies.
	31	Inclusive design principles.
	32	Utilise Connecting with Country Framework (Starts with Country, Listens to Country, Designs with Country and Cares for Country).
	33	Engage with First Nations businesses and communities to integrate design features, procure services, embed materials within supply chains, and provide employment opportunities.

Proposed benchmarks

Theme	Target	Applicable development type	Proposed minimum benchmark	Comment
Energy, thermal comfort, and carbon	BASIX Energy targets Midrise (4-5 storey units) Residential (35) +10% High rise (6 storey units or higher)	 Residential Residential	 (35) +10% (25) +10%	Zone E1A Expressed as percentage reduction over NSW Benchmarks (in bracket). Applicable to all residential buildings.
	NABERS Energy rating for commercial buildings	Mixed use Offices Hotels Retail	5.5 Star	Well recognised industry standard for the assessment of energy efficiency. Potentially include requirement for Commitment Agreement to provide more rigour in as built achievement of proposed standards.
	Promote initiatives for Net-Zero Carbon Precinct	All	100% by 2050 50% by 2030 (in line with NSW State's objective)	Percentage reduction in greenhouse gas emissions.
	Onsite renewable energy generation	Residential Mixed use Offices Hotels Retail	Allocate minimum 20% of new roof space to energy generation	NA.

Theme	Target	Applicable development type	Proposed minimum benchmark	Comment
Energy, thermal comfort, and carbon	Electric vehicle ready car parking spaces	Residential Mixed use Offices Hotels Retail	Residential; 100% car parking Spaces Mixed use, Offices, Hotels, Retail; All other building classes – 25% car parking spaces	The NCC 2022 states the following requirements for electric vehicle car parking spaces: *Electrical distribution boards dedicated to servicing EV charging in a carpark must be provided for the following:* - *Class 2: 25% car parking spaces* - *Class 5 or 6: 10% car parking spaces* - *Class 3, 7b, 8, 9: 20% car parking spaces* NSW EV Strategy direction: it is intended to increase NSW EV sales to 52% by 2030–31.
	Embodied carbon	Residential Mixed use Offices Hotels Retail	20% reduction (immediate) 40% reduction for development commencing in 2030 and beyond	As per Green Star Buildings 'Upfront Carbon Emissions' credit Applicable to all building typologies.
Water	NABERS Water rating for non-residential buildings	Mixed use Offices Hotels Retail	4 Star	Well recognised standard for assessment of water efficiency in buildings of these types.
	BASIX Residential Water targets	Residential	(40) +10%	Expressed as percentage reduction over NSW Benchmarks (in bracket). Applicable to all residential buildings.
	Public open space irrigation with non-potable water	Public Domain	100%	Remove all potable water use for irrigation though use of recycled or reused water, combined with planting that has low water requirements.

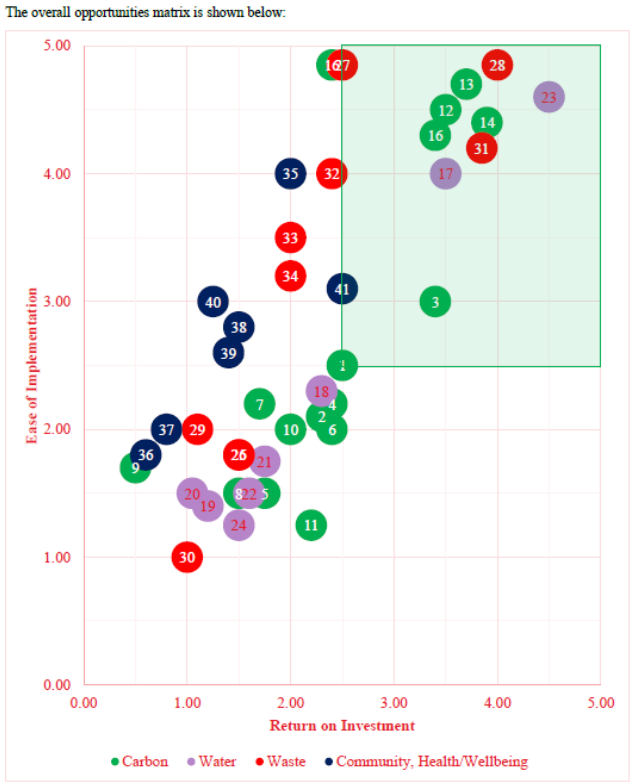
Theme	Target	Applicable development type	Proposed minimum benchmark	Comment
Waste	Construction & demolition waste diverted from landfill - Buildings	Residential Mixed use Offices Hotels Retail	90%	Full points as per Green Star Buildings 'Responsible Construction' credit. Applicable to all building typologies. Note that any waste not normally sent to landfill is excluded from calculation.s
	Construction & demolition waste diverted from landfill – Public Domain	Public Domain	60%	As per Green Star Communities Credit 30.1 'Construction and Demolition Waste'. Note that any waste not normally sent to landfill is excluded from calculations.
	Diversions of operational waste across all waste streams	All	90% by 2030	Aligns with City of Sydney resource recovery goals. Applicable to all building typologies and the public domain.

Implementation

Implementation

WORK IN PROGRESS

- Arup intends to rate initiatives in terms of ease of implementation and community benefit. To achieve this, a graphic, similar to the graphic inset, will be developed. The Y axis will represent ease of implementation while X axis will represent community benefit.



ARUP