



## **SUBMISSION:**

### **Western Sydney Aerotropolis Planning Package:**

- Western Sydney Aerotropolis Plan
- Western Sydney Aerotropolis Discussion Paper on the Proposed State Environmental Planning Policy
- Western Sydney Aerotropolis Development Control Plan 2019, phase 1

### **NSW Department of Planning, Industry and Environment**

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### **Western Sydney Regional Organisation of Councils**

March 2020

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## 1. Introduction

Western Sydney Regional Organisation of Councils (WSROC) welcomes the opportunity to provide a response and submission to the **Western Sydney Aerotropolis Planning Package** released by the NSW Department of Planning, Industry and Environment

We recognise the Aerotropolis as a critical piece of infrastructure and development for Western Sydney and encourage the development of the site to maximise benefits to the people that call Western Sydney home at present, and those that will live, work and play in the region in the future. We emphasise the need to ensure no harm is done to current and future residents and to the unique environmental attributes that the region supports. As per the WSROC Board resolution (23 February 2017), we advocate for the Aerotropolis to deliver equity, fairness and maintain quality of life for the whole Sydney basin and the Blue Mountains.

### 1.2 About this submission

Please note that this submission as prepared on behalf of WSROC member councils. Some of our councils will make their own submission. This document should be viewed in addition, and complimentary to those submissions.

This submission consists of three parts:

- the first part a summary of our main comments
- the second part more specific feedback on individual documents.
- The third part is a detailed assessment of waste management considerations as part of the planning package.

WSROC would welcome an opportunity to further discuss this submission. Should there be any questions regarding this submission, please do not hesitate to contact WSROC CEO, [REDACTED]

## 2. About the Western Sydney Regional Organisation of Councils

The Western Sydney Regional Organisation of Councils (WSROC) is a membership organisation representing eight councils in Greater Western Sydney (GWS). Members include Blacktown, Blue Mountains, Cumberland, Fairfield, Hawkesbury, Lithgow, Liverpool and Parramatta.

With a reputation for considered policy analysis and bipartisan advocacy, WSROC brings a collective voice to those issues which are crucial for Western Sydney's growing population. WSROC's primary role is to represent the councils and communities of Greater Western Sydney as well as developing resource sharing and other co-operative projects between Greater Western Sydney councils. Current projects include the NSW EPA funded [Western Sydney Regional Waste Avoidance and Resource Recovery Strategy](#), [Western Sydney Energy Program](#) and [Turn Down the Heat Strategy and Action Plan](#) which takes a collaborative approach to urban heat adaptation and mitigation in the region.

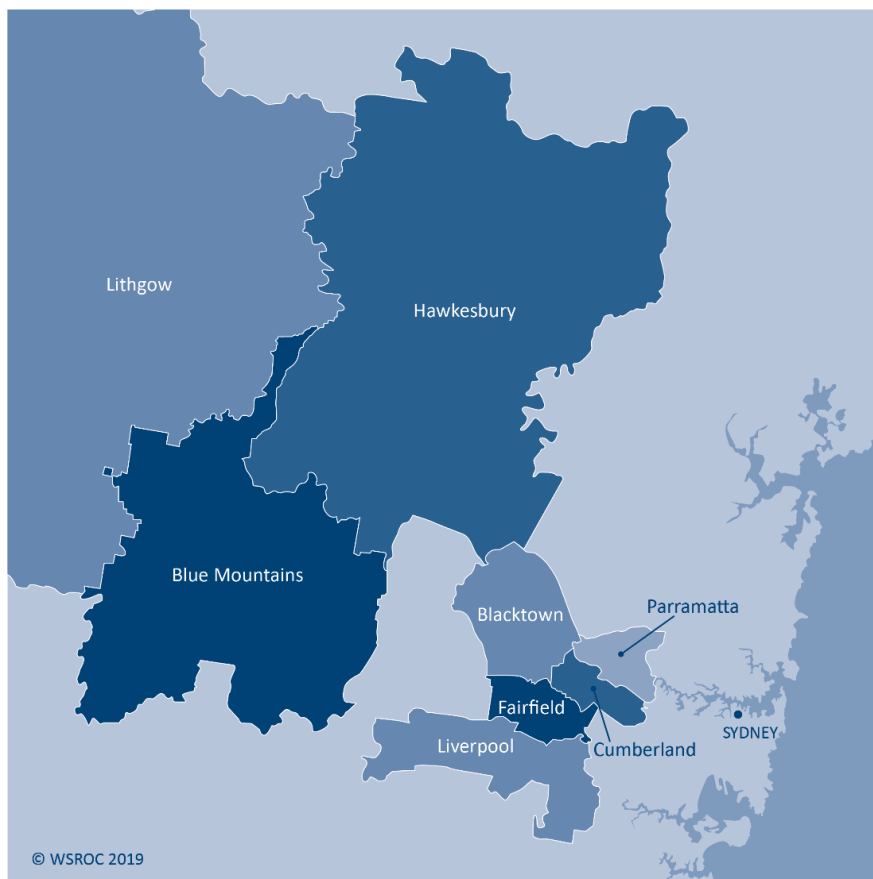


Figure 1. WSROC member councils.

### 3. General comments

WSROC supports the planning package's focus on landscape-led development and we are pleased to see a strong focus on healthy and sustainable living. However, we do note that the current documents remain as principles and objectives. While many of the high-level statements are supported, we caution that in order for these principles to translate into the desired outcomes on the ground, appropriate benchmarking, controls and assessments will need to be implemented. We are concerned that the non-mandatory nature of the DCP means this document will lack the weight to ensure developments are of a quality required to achieve the vision.

We further note that while we recognise the need for incremental development, the current uncertainty regarding critical infrastructure placement and flight paths diminish the rigour of, and the ability to properly assess, the current documents. It is impossible to analyse the adverse impacts to the environment and the community or confirm whether these will be sufficiently mitigated through these draft planning documents.

#### 3.1 Housing

WSROC keenly appreciates the challenge and the need to provide affordable housing to a rapidly growing population. However, we are concerned that the discussion regarding housing affordability has focused almost exclusively on the upfront costs of a dwelling rather than the ongoing running costs of providing energy and water, as well as indirect costs such as the cost of transport from a dwelling to employment, education and services. For example, Western Sydney households spend, on average, 100 per cent more on cooling than households in the city's east<sup>i</sup>. This is due to the region's naturally hot climate, but also the Urban Heat Island Effect (UHI) which is contributing to major health, affordability and productivity challenges in the region. As outlined in the Greater Sydney Commission's Metropolitan and District Plans, the area under consideration is already one of the hottest in the Sydney basin, and will become hotter in future due to climate change and rapid urban development.

We strongly argue that the NSW Government has a duty to determine the minimum standard that we are willing to accept for low-income households which are already highly vulnerable to a range of external influences including fluctuations in energy prices, transport disadvantage, access to services and ongoing economic restructuring. The quality of our housing also has broader flow on effects for the wider economy. Poor housing puts stress on our city's energy grid, water security, health outcomes and productivity<sup>ii</sup>.

In addition, WSROC expresses concern regarding the lack of clarity around flight paths. New developments are currently being established around the airport. To ensure appropriate noise amelioration is implemented for developments across the Western Parkland City, it is critical to have flight paths confirmed in order to plan appropriately. If this is not done, we will fail to deliver on the District and Aerotropolis' vision of creating healthy and resilient communities.

**Recommendation:**

- That the definition of affordable housing be broadened to consider the ongoing costs of essential services to a dwelling including: energy, water, waste and transport.
- That all new developments be designed to increase resilience to the growing impacts of extreme heat including both energy efficiency (internal) and urban heat mitigating design principles (external) including the use of cool materials, greening and water.
- WSROC stresses the need to provide clarity around flight paths in order to ensure Western Sydney Parkland developments are put in place based on a do-no-harm principle. Noise amelioration should be prioritised for impacted developments, both existing and new developments.

### 3.2 Waste

The Western Sydney Aerotropolis Planning Package has made considerable improvements on past NSW planning documentation to address waste and resource recovery in this framework. To adequately consider waste management and deliver the intended liveability, productivity and sustainability outcomes for the Aerotropolis, the planning framework must make improvements to understand and distinguish between:

- Waste management as an essential service delivered by local councils;
- Waste management systems within individual developments; and
- Waste and resource recovery infrastructure such as waste and resource recovery facilities that process and dispose of waste across the entire region.

It is great to see there is some integration of the NSW Circular Economy Policy Statement within the planning package, however this fails to be supported by any real indication of how this will be delivered across the Aerotropolis site, or how circular economy enabling infrastructure land uses within desired precincts will be delivered. Similarly, while the documents note an intent to divert waste and enable resource recovery, there are no strategic instruments in this package which

adequately drive improved recovery of resources and reduction of waste in line with NSW Policy; either through construction stage or ongoing operation of developments in the Aerotropolis. These two strategic shortfalls render other well-considered waste objectives and principles in the package meaningless, and are likely to result in ad hoc waste management and resource recovery approaches after the well-considered design of other essential services and precinct requirements have taken place.

Specifically, this package fails to:

- Recognise the limited waste and resource recovery infrastructure in Sydney, and the strategic value of the existing facilities located in the Aerotropolis;
- Recognise the role of councils as essential service providers and stakeholders in both utility provision and contributor to NSW WARR and Zero Net Carbon emissions targets;
- Clearly and consistently distinguish the place of waste processing and disposal infrastructure between land use suitability in the WSA Draft Plan, and land zoning in the Draft SEPP Discussion Paper;
- Ensure consistency between the Draft Aerotropolis Plan's Vision and Planning Principles with Phase 1 Draft Development Control Plan performance outcomes and commit to formalising critical waste service design requirements in Phase 2 DCP in time for development to occur;
- Recognise the impact of poorly designed source separation and waste collection on productivity and liveability in new developments, and the critical need for integration with Penrith and Liverpool's existing waste collection services;

***Recommendation:***

Please refer to **Appendix 1** for a more detailed response which outlines the specific key concerns and proposed recommendations to correct inconsistencies and clarify confusion across the three documents. Importantly, this detailed response also draws attention to the important principles and objectives that should be maintained in future document versions and support for key goals of the package, including integration of circular economy principles and key performance outcomes for waste reduction, efficient waste storage and collection systems, and provision for safe onsite waste servicing.

### 3.3 Urban heat

WSROC strongly supports the focus on heat mitigation and adaptation as part of the current planning package. Heat is a major issue for Western Sydney due to its climate, lack of sea breeze and ongoing development (Urban Heat Island Effect). Unfortunately heat tends to affect our most vulnerable disproportionately. People who don't have the means to adapt their homes or struggle to pay the electricity bill for cooling, live in our city's urban heat hot-spots. It is therefore critical that heat mitigation is prioritised as part of affordable housing. We further reiterate the need to ensure housing prioritises health and resilience. This should include design to maximise both internal and external comfort for residents and workers.

WSROC commends the NSW Government on the emphasis of green space and retention of water in the landscape, both of which play a key role in mitigating against heat. We especially appreciate the Government's focus on including cool materials into this mix to maximise how urban design mitigates heat absorption.

While we champion the strong focus on green space and street trees, we note that Sydney currently experiences a net-deficit in urban canopy. Any effort should therefore look at contributing to an actual increase of green space and retention of existing and established trees. Above all, we specifically highlight the importance of *quality* green space, and refer to the need to include targets and objectives for not just canopy cover, but also for species selection, site prioritisation and irrigation and maintenance.

While governments certainly have a critical role to play in maximising quality green space, the reality is that the vast majority of space is privately owned. To be able to achieve the Aerotropolis' liveability and resilience objectives, it is critical to extend heat mitigation design to residential housing and commercial developments. Any opportunities to incentivise residents and business to maximise green space in the private domain, would be welcomed.

**Recommendation:**

- That the stage 2 documents include clear targets, controls and assessment pathways for green space that focuses on quality over quantity.
- Identify opportunities to incentivise maximising quality green space in the private domain.
- That all new developments be designed to increase resilience to the growing impacts of extreme heat. Design should be a combination of both energy efficiency (internal) and urban



heat mitigating design principles (external), and should include the use of cool materials, greening and water.

### 3.4 Transport

While WSROC supports the concept of the 30-minute city, we caution that this can only be achieved when there is a clear vision of where critical infrastructure is placed. Even though we understand the thinking behind incremental development, we are concerned that this approach will severely impede the ability to realise a true 30-minute city. Two key risks are the current uncertainty regarding the placement of critical infrastructure (incl Sydney Metro stations) and the delivery of public transport infrastructure in line with public demand. We are concerned that sequencing development as such will inherently result in business as usual development; creating car-dependent cities which will miss the opportunity to generate mode shift from cars to public transport and active travel.

Transport planning needs to move away from the current predict and provide approach. Traffic predictions are always going to be high, due to the infrastructure already in place and behaviours already established. Planning needs to create its vision for public transport and active travel and prioritise this infrastructure early. Demand for public transport will never come if infrastructure is not in place and roads remain the easy option.

The Aerotropolis will play a key role in addressing the current employment deficit of Western Sydney. However, it should be noted that transport and employment are intrinsically linked. The currently radial, CBD-centric nature of Sydney's public transport network has resulted in poor public transport linkages to and from Western Sydney's existing employment and industrial hubs, making them harder for residents to access (even though they may be geographically closer), and less attractive to new, knowledge-based industries. Therefore, unlocking the potential of Western Sydney Airport as a key employment zone will require improved intra-regional connections that link residents to their local strategic centres and employment hubs. Ensuring intra-connectivity of Greater Western Sydney to Western Sydney Airport and to other Districts is also critical to creating a true 30-minute city.

#### **Recommendation:**

- Public transport routes (including stations) are identified and publicised at an early stage to allow for planning of housing and other resources in appropriate distance of transport hubs.
- Public transport is activated at an early stage (rather than waiting until population levels reach capacity) to support adoption of public transport modes (as opposed to car dependency). This includes acceleration of the Western Sydney rail priorities outlined in *Future Transport 2056*.

- A stronger focus on the need to connect the Aerotropolis with other transport and employment hubs in Greater Western Sydney

### 3.5 Employment

While the Aerotropolis will play a central role in future employment and economic development of Western Sydney, it cannot, and should not be expected to single-handedly solve the region's employment challenges. *Jobs for Western Sydney: Building Western Sydney's Future* outlines that the airport is expected to generate 28,000 direct and indirect jobs by 2031. By contrast, the airport plan lists a collective 54,000 jobs within the Aerotropolis precinct. This discrepancy highlights a general inconsistency in the employment projections for this development.

More broadly, it should be acknowledged that while the Aerotropolis will be a significant catalyst for localised employment, the Aerotropolis alone will not be able to address the existing or future employment needs of the region. At present over 300,000 Western Sydney residents leave the region each day for work. By 2036, this number will have increased to over 400,000<sup>1</sup>.

To deliver the scale of jobs growth Western Sydney needs, the Western Sydney Aerotropolis Plan must show a greater focus on strengthening transport connections with Greater Western Sydney's network of existing employment zones (e.g. Wetherill Park, Eastern Creek, St Marys, Sydney Business Park and Rydalmere) and the neighbouring regions of Greater Sydney, Lithgow and the Central West, Wollongong and the Central Coast. Given the Aerotropolis' primary strength is as a national and international port, delivering better transport connectivity to surrounding regions is essential to maximising its productivity, as well as addressing the future liveability and employment needs of the region.

#### **Recommendation:**

- The Western Sydney Aerotropolis Plan should give greater insight into how the precinct relates to its surrounding regions, and how inflows and outflows will be managed.
- A stronger focus on the need to connect the Aerotropolis with other transport and employment hubs in Greater Western Sydney.

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<sup>1</sup> O'Neill, P. (2016). Addressing Western Sydney's Jobs Slide. Western Sydney University.

- Include the need to creating transport and employment linkages to other regional areas such as Lithgow, Newcastle and Wollongong.

### 3.6 Energy

Energy inequity is a major concern for Western Sydney and has been collectively identified as an area of regional priority by WSROC councils. While environmental factors contribute to higher energy demand<sup>iii</sup>, Western Sydney's residents often have less access to opportunities and technological improvements compared to other areas in Sydney. Rising electricity prices continue to put strain on the budgets of businesses and communities alike. This can lead to critical health and social issues when residents are unable to run heating or cooling devices due to concern over their electricity bill<sup>iv</sup>. Mortality rates amongst vulnerable communities are increasing due to extreme heat, and relief in the form of affordable energy, air-conditioned community facilities, and passive cooling design strategies are now a matter of urgency for policy makers.

WSROC is very supportive of a transition to a renewable future, but we stress that all care should be taken to develop inclusive pathways in order to decrease energy inequity and ensure all communities share in the benefits of the transition.

WSROC further supports the Aerotropolis' vision that the precinct design will include beyond compliance provisions targeting zero net carbon emissions. We do however note that the SEPP and DCP currently lack the detail to support this vision. We understand that further detail may follow in the next stage planning documents but would like to flag that unless appropriate targets and controls are implemented, the proposed outcomes will not be attained.

#### **Recommendation:**

- Deliver consistent, mandatory planning controls across the Aerotropolis for energy and greenhouse emissions, including increased standards for BASIX.
- That reducing energy inequity is a key element in any renewable energy transition.
- That further planning documents outline specific targets and controls to support the net zero emissions vision.

### 3.7 Local government collaboration

WSROC emphasises the need for any core infrastructure that councils will ultimately control (roads, bridges, lighting, stormwater assets, etc.), to meet the local government standards for maintainability and resource efficiency. Many proposed assets and infrastructure will fall back to councils once the

bulk of construction is complete. We stress the need for assets to be long lasting, low cost and low impact.

**Recommendation:**

- WSROC recommends that the any infrastructure be integrated with council approval processes and standards.

### 3.8 Health

Any adverse impacts on community health and environment should not be isolated to the airport impact alone. The planning documents should consider the impact of real-world conditions – which should include the cumulative effect of projects associated with the Western Sydney Airport such as the Northern Road upgrades, the recently announced South West Priority Area and the M9 Orbital on traffic congestion, noise or air pollution.

**Recommendation:**

- That planning documents identify the cumulative effect of projects associated with the Western Sydney Airport, not just operations within the airport precinct, on community health.

## 4. Document specific comments

### 4.1 Western Sydney Aerotropolis Plan

Page	Comment
P4	<p><b>Thirty-minute city</b></p> <p>WSROC supports the concept of the 30-minute city. However, we caution that unless public transport hubs (including stations) are identified and publicised at an early stage to allow for planning of housing and other resources in appropriate distance of transport hubs, the proposed vision will likely not be attained. We further argue that public transport will need to be in place and activated at an early stage. If the Aerotropolis will wait until population levels reach capacity, transport mode shifts will become increasingly difficult.</p>
P9	<p><b>Objective 9 Diverse, affordable and well-located housing</b></p> <p>WSROC strongly argues that any affordable housing should also be liveable, resilient and sustainable housing to ensure that affordability stretches beyond the upfront housing costs and includes consideration for healthy and resilient living.</p> <p>WSROC therefore recommends that this objective should read: Diverse, affordable, healthy, resilient and well-located housing.</p>
P10	<p><b>The Aerotropolis will connect to Greater Parramatta and the Harbour CBD to realise the vision for Greater Sydney as a metropolis of three cities.</b></p> <p>While WSROC supports the need to connect the three cities, we stress the need to ensure we also create transport and employment connections <i>within</i> Greater Western Sydney. While the new airport will play a critical role in providing much needed employment opportunities for the region, it will not be able to address the current employment deficit on its own.</p> <p>WSROC recommends changing the wording to reflect the following:</p> <p><i>The Aerotropolis will connect to Greater Parramatta and the Harbour CBD to realise the vision for Greater Sydney as a metropolis of three cities. It will further improve Western Sydney's intra-connectivity and support networks linking to other regional areas such as Lithgow, Newcastle and Wollongong.</i></p>
P23	<p><b>The Aerotropolis will be a regionally and nationally significant employment area for the entire Western Parkland City.</b></p> <p>WSROC acknowledges the importance of the Airport for the Western Parkland City, but also emphasises that to achieve the best possible outcomes for the region there is a need to ensure</p>

	<p>integration with Sydney metropolitan area, and specifically with the Central City transport and employment hubs.</p>
P23	<p><b>Designing a cool, green city</b></p> <p>WSROC fully supports the vision as outlined; a cool, green new city that minimises its urban footprint and maximises opens space, waterways and recreation areas. We recognise the importance of this vision to ensure we build healthy, liveable places for our residents and businesses and create resilient communities in the face of a changing climate and rapid changing urban landscape.</p> <p>We do however reiterate the need to ensure appropriate controls and assessments are implemented. To maximise the health benefits and minimise harm, we recommend the second phase of the DCP be strengthened to ensure high quality building design and construction standards are met within the Aerotropolis.</p>
P24	<p><b>Public Domain</b></p> <p>WSROC supports the landscape-led approach and the focus on developing quality public spaces. We are however concerned that the non-mandatory nature of the DCP will lack the capacity to ensure the quality of the public domain required to achieve the vision.</p>
P36	<p><b>Public transport services will be staged with development.</b></p> <p>WSROC is very concerned that the vision of creating a 30-minute city and prioritising active transport will not be achieved through the current suggested strategies of staging of public transport services with development based on demand.</p> <p>Travel behaviours are difficult to change once initiated, so it is vital that people are able to live the vision right from the outset, not in 10 to 20 years when demand arises. Traffic predictions are always going to be high due to the infrastructure already in place and behaviours already established. Demand for public transport will never come if infrastructure is not there and roads remain the easy option.</p>
P40	<p><b>Energy infrastructure</b></p> <p>WSROC recognises the opportunities the Aerotropolis provides for the integration of best practice energy infrastructure. We however note that there is little detail in the planning package regarding how this will be implemented. Without clear guidance and targets we have our doubts whether the vision will be attained.</p>

P44	<p><b>Aircraft noise and development</b></p> <p>WSROC stresses the need to provide clarity around the flight paths in order to ensure Western Sydney Parkland developments are put in place based on a do-no-harm principle. Noise amelioration should be prioritised for impacted developments; both existing and new developments.</p>
P52	<p><b>Resilience and adaptability – urban cooling</b></p> <p>WSROC strongly supports the emphasis on urban cooling and commends the government on its focus on the need to include greening, retain water in the landscape and use cool materials. It is however noted that currently no controls are in place to enforce these statements. We understand this will be included in the precinct planning stage and will await detail as they are made public.</p>
P53	<p><b>Climate change resilience</b></p> <p>WSROC recognises the need to plan for a changing climate. We note that those impacted more severely by extreme weather, are our vulnerable communities. We therefore suggest that adaptation efforts are prioritised for our most vulnerable. See also our comments on affordable housing (ins section 3.1 of this document).</p>
P54	<p><b>Floodplain management</b></p> <p>All planning refers to modelling of 1 in 100-year flood events,’ which is a lower standard than the Probable Maximum Flood (PMF) originally cited in the Western Sydney Land Use and Infrastructure Implementation Plan (LUIIP). This means that more land will be available for development than would be available if using the PMF.</p> <p>Given that extreme weather events are expected to increase in frequency and severity as a result of climate change, this change from PMF to 1 in 100 may be putting communities at future risk.</p>
P57	<p><b>Liveability - Provide affordable housing consistent with the Region Plan.</b></p> <p>WSROC reiterates the need for affordable housing to be more holistic and consider the ongoing costs of essential services to a dwelling including: energy, water, waste and transport.</p> <p>We further stress the need to ensure that all new developments be designed to reduce running costs and increase resilience to the growing impacts of extreme heat including, energy efficiency (internal) and urban heat mitigating design principles (external) including the use of cool materials, greening and water.</p>

P57	<p><b>Precinct Planning - Enhance the efficient use of energy, water and other resources, and renewable energy generate to achieve net zero emissions for the Aerotropolis.</b></p> <p>WSROC reiterates the need for inclusion of clear targets and controls in order to achieve the intended outcome. We note that there currently is insufficient detail in the planning package regarding how this will be implemented.</p>
P58	<p><b>Department of Planning, Industry and Environment manage the 5 Million Trees program to increase urban canopy cover</b></p> <p>WSROC supports the need for increased canopy cover. However, to ensure the best outcome is delivered on the ground, we strongly stress the need to consult with local government on the implementation of the program to ensure efforts are maximised. We further recommend that clear controls be implemented which include:</p> <ul style="list-style-type: none"> <li>• Canopy targets that aim for a net-increase in canopy across Sydney metro.</li> <li>• Considerations regarding maintenance, irrigation, species selection and site location are included in program delivery.</li> </ul>
56 - 83	<p><b>Precinct planning</b></p> <p>For all precincts WSROC recommends the planning package prioritises healthy and resilient living. This should therefore also be prioritised in any residential development.</p>
P58	<p><b>Aerotropolis Core Precinct</b></p> <p>We commend the goal to locate all residential communities within 800metres or a 10-minute walk of the Metro Station, but find this may in all likelihood be impossible, based on the size of the precinct and the likely station location at the Aerotropolis Core. There will need to be strong controls in place to ensure that residential development only occurs within this walkable distance from the station.</p>
P59	<p><b>Protection of the Wianamatta–South Creek Precinct</b></p> <p>WSROC strongly supports the retention of water in the landscape, the protection of significant remnant vegetation, and other Blue–Green Grid elements. We note however that strong controls will need to be implemented to ensure this vision will be actualised.</p>
P60-61	<p><b>Agribusiness precinct</b></p> <p>WSROC acknowledges and supports the importance of the agribusiness precinct. We would like to highlight that its importance is not solely derived from its economic value of export potential, but also for local food security. The latter should be maximised ensuring fresh food supplies to Western Sydney.</p>



P66	<p><b>Wianamatta–South Creek Precinct</b></p> <p>WSROC supports the strategic outcome to protect existing mature trees and enhance urban tree canopy. In order to achieve this outcome, clear controls and assessments will need to be put in place, these should include consideration of: net-increase in canopy, species selection, maintenance and irrigation considerations and location prioritisation.</p>
P85	<p><b>P85 8.2.2 Local infrastructure contributions</b></p> <p>It is positive to note that local infrastructure funding has been considered as part of this plan. Local infrastructure backlogs are prevalent across many rapidly growing areas of Western Sydney as local governments experience unprecedented demand for costly new infrastructure yet have limited capacity to increase their revenue to meet this demand. It is important to ensure that both Liverpool and Penrith councils are supported in the provision of local infrastructure by appropriate developer, state and federal government contributions (as appropriate) to support the timely delivery of liveability infrastructure including parks (and equipment), walking and cycling paths, community centres, libraries and swimming pools as appropriate.</p>
P85	<p><b>Stage 1 Sydney Metro Greater West alignment</b></p> <p>WSROC is concerned regarding the delay in announcing key infrastructure placement and timing, including the Sydney Metro West stations. Unless stations are locked in from the onset and public transport is operational at an early stage, the vision of establishing a true 30-minute city will fail, and the provision of such infrastructure retrospectively will become more expensive.</p>
P87	<p><b>Community engagement</b></p> <p>WSROC recognises the value of and the need for community and stakeholder engagement on major projects such as the Aerotropolis planning. We therefore recommend that the planned community consultation process described on page 87 is carried out following best practice standards. The level and type of planned community and stakeholder engagement is currently unclear within the documents.</p>
P92	<p><b>SU14</b></p> <p>WSROC supports the Aerotropolis’ vision that the precinct design will include beyond compliance provisions targeting zero net carbon emissions – however, in order to attain the objectives stated, this needs to be backed by clear controls and targets. Currently the SEPP and DCP lack detail needed to achieve the aspirational outcomes on the ground.</p>
P93	<p><b>Planning Principles Objective 5</b></p> <p><b>A sustainable, low carbon Aerotropolis that embeds the circular economy</b></p>

	WSROC reiterates the need for inclusion of clear targets and controls in order to achieve the intended outcome. There is some integration of the NSW Circular Economy Policy Statement and low carbon planning within the planning package, however this fails to be supported by any real indication of how this may be delivered across the Aerotropolis site.
P94	<p><b>Objective 7 – IC3</b></p> <p>Success of a smart city will heavily depend on the collaboration between all stakeholders to ensure that new and existing systems are integrated. WSROC emphasises the need for the Aerotropolis to work closely with councils from the design stage through to project completion, as councils will inherit and use many of the systems being proposed.</p>

#### 4.2 Western Sydney Aerotropolis Discussion Paper on the Proposed State Environmental planning policy

Page	Comment
P5	<p><b>Affordable Rental Housing</b></p> <p>WSROC acknowledges the need for affordable housing, but at the same time reiterates that any affordable housing should nonetheless be designed to provide the residents with a safe, healthy and sustainable home. Affordability should stretch beyond the upfront housing costs but includes consideration for healthy and resilient living (including addressing heating and cooling demands).</p>
P7	<p><b>Australian Noise Exposure Concept / Australian Noise Exposure Forecast</b></p> <p>WSROC reiterates the danger of staging developments and the delay in announcing flight paths. Developments are currently being implemented surrounding the Aerotropolis, to ensure appropriate noise amelioration is implemented, certainty regarding flight paths is critical.</p>
P11	<p><b>Essential Infrastructure Provision</b></p> <p>While VPAs can be a successful source of funding for new developments, care should be taken to ensure that VPAs – do not unduly impact (directly or indirectly) existing residents and businesses operating within or within the vicinity of the aerotropolis precinct.</p>
Part 3	<p><b>Proposed land use objectives</b></p> <p>The zone objectives should include language that demonstrates a clear commitment to liveability, resilience and wellbeing in Western Sydney.</p>
P24	<p><b>Wianamatta-South Creek Precinct Boundary and Flood Planning Levels</b></p> <p>We note that the new boundary no longer uses the Probable Maximum Flood line to determine the precinct, instead using the 1 in 100 chance per year flood planning level. Given that extreme</p>

	weather events are expected to increase in frequency and severity as a result of climate change, this change from PMF to 1 in 100 may be putting communities at future risk.
P26	<p><b>Proposed Maps</b></p> <p>WSROC understands that detailed development controls will be inserted into the proposed SEPP upon completion of precinct planning. We reiterate the need to ensure controls provide appropriate detail, targets and guidance in order to achieve the proposed Aerotropolis vision on the ground.</p>

### 4.3 Western Sydney Aerotropolis Development Control Plan 2019, phase 1

Many of the performance outcomes as outlined in the proposed DCP are supported by WSROC. We are however concerned that the current DCP performance indicators are generally high-level statements and do not include specifics or targets. We also flag the non-mandatory nature of the DCP. We therefore emphasise that unless the planning documents are supported by specific controls, targets and assessment pathways, the Aerotropolis will fail to meet the listed objectives and outcomes.

Page	Comment
P30	<p><b>Aviation safeguarding PO8</b></p> <p>WSROC understands the need to include ‘Development does not impact on the operational aspects of the Airport with regard to light emission and reflective surfaces’. However, we also note that mitigating Urban Heat Islands may require high albedo materials. We recommend that in areas surrounding the airport where the use of light emission and reflective surfaces are limited, alternative materials are used which do not contribute to, but mitigate, urban heat.</p>
P39	<p><b>Public domain PO10</b></p> <p>WSROC supports this performance outcome but recommends the DCP include clear targets around scale and species selection to achieve the various outcomes (incl. biodiversity and heat mitigation).</p>
P40	<p><b>Street Design and Network Layout - Objectives</b></p> <p>WSROC recommends that street design should prioritise healthy living, including design to mitigate and adapt to extreme heat, and design for active transport. WSROC recommends this to be included as part of the objectives.</p>

P40	<p><b>Street Design PO8 and 9</b></p> <p>We note that this performance outcome is duplicated.</p>
P40	<p><b>Street Design PO7</b></p> <p>WSROC suggests broadening this outcome to say: “Carriage widths and impervious road surfaces (vehicular and pedestrian) should be minimised.” We also reiterate the need to provide clear targets for this outcome to ensure the desired vision is obtained.</p> <p>We further highlight the need to ensure that adequate street and laneway widths be provided to ensure new developments can be integrated with councils’ waste service. While there can be merit in seeking a reduction in road widths, it must not compromise the ability for new developments to be safely and efficiently serviced by councils and emergency services.</p>
P41	<p><b>Street Networks PO22</b></p> <p>WSROC commends the Planning partnership on developing the comprehensive “Western Sydney Street Design Guidelines”, which in our view is a very valuable, holistic approach to street design that incorporates key elements to prioritise health and active living. We especially support the elements in relation to heat mitigation.</p> <p>However, one note of caution: It is vital at precinct planning stage and development design that adequate street and laneway widths be provided to ensure new developments can be integrated with councils’ waste services. While there can be merit in seeking a reduction in road widths, it must not compromise the ability for new developments to be safely and efficiently serviced by councils. Care needs to be taken in the reliance on the current road width specifications of the Draft Western Sydney Street Design Guidelines, which in current form do not allow for safe and unimpeded access of councils’ waste collection trucks or emergency service vehicles and need further review in this space.</p>
P42	<p><b>Building Design - Objectives</b></p> <p>Any building design should prioritise healthy living, including design to mitigate and adapt to extreme heat. WSROC recommends this to be included as part of the objectives.</p>
P43	<p><b>Building Design PO6</b></p> <p>WSROC recommend including the need for building design to maximise both internal and external thermal comfort.</p>
P44	<p><b>Private open space</b></p> <p>WSROC recommends including the need for urban cooling (including shade provision) as part of this objective (either PO24 or PO26).</p>

P48	<p><b>Design for Climate, Urban Heat and Thermal Comfort PO4</b></p> <p>The document refers to “Use low-reflectivity roofing and other building materials, streets pavements that are low reflectivity and pervious.” We note that the terminology ‘low-reflectivity’ might cause confusion. Generally, a cool surface material has low heat conductivity (conducts less heat into its interior), low heat capacity (stores less heat in its volume), high solar reflectance (albedo)v. We therefore recommend changing ‘low-reflectivity’ to either ‘cool materials’ or ‘high albedo’.</p>
P48	<p><b>Design for Climate, Urban Heat and Thermal Comfort PO5</b></p> <p>WSROC recommends changing this Performance Outcome to read:</p> <p>Building materials used should contribute internal and external thermal comfort, minimise the necessity for mechanical heating and air conditioning.</p> <p>We further encourage the inclusion of an additional Performance Outcome under this header which prioritises building materials used to be sustainably sourced and encourages the use of recycled materials and procurement in line with circular economy objectives of this package.</p>
P48	<p><b>Design for Climate, Urban Heat and Thermal Comfort PO7</b></p> <p>WSROC strongly supports the need to “Protect, enhance and extend the urban tree canopy”. However, we would recommend clear targets to be established to attain this outcome. We further advocate for this Performance Outcome to include prioritisation of established, old growth trees.</p>
P48	<p><b>Green Infrastructure PO8 – PO10</b></p> <p>We note that street trees are not specifically itemised under Green Infrastructure, however they provide critical social, ecological and health benefits. Ensuring street trees and green space is considered as critical urban infrastructure will ensure they are integrated at the onset of any planning proposal, and appropriate location, space and maintenance considerations are implemented.</p> <p>WSROC recommends the recognition of green space and street trees as critical infrastructure as part of the performance outcomes.</p>
P48	<p><b>Tree Preservation PO11</b></p> <p>WSROC is concerned regarding the vagueness of this performance outcome and recommends including clear guidelines and targets for protecting and enhancing existing vegetation.</p>

P48	<p><b>Tree Preservation PO13</b></p> <p>WSROC understands the need to balance the safety of trees with health, resilience and environmental outcomes. However, the current wording of this performance outcome skews this balance, and does not support broader outcomes around canopy cover. WSROC recommends a review of this Performance Outcome to include: “Trees are maintained in an appropriate manner that balances community safety with health, resilience and environmental outcomes.”</p>
P49	<p><b>Tree Preservation PO15</b></p> <p>WSROC notes that all trees will provide a certain level of shade. We recommend for this outcome to be more specific.</p>
P49	<p><b>Affordable Housing (PO1 – PO5)</b></p> <p>WSROC recommends inclusion of an additional Performance Outcome which requires affordable housing to prioritise healthy and resilient living, including targets for internal and external thermal comfort and energy efficiency.</p>

## Appendix 1 – Waste specific feedback and recommendations

### 1. Introduction

In 2014, the NSW Environment Protection Authority (EPA) funded Western Sydney Regional Organisation of Councils (WSROC) to develop and deliver the Western Sydney Regional Waste Avoidance and Resource Recovery Strategy (Strategy) on behalf of nine councils: Blacktown City Council, Blue Mountains City Council, Cumberland City Council, Fairfield City Council, Hawkesbury City Council, Liverpool City Council, Parramatta City Council, Penrith City Council and The Hills Shire Council.

The Strategy (now in its second iteration) was developed to outline future directions for resource recovery practices across Western Sydney, and to explore options for addressing common waste management challenges faced by councils in the region.

The Waste Strategy team has been working with public sector agencies, private sector organisations and the councils of the Western Sydney Waste Managers Group<sup>2</sup> to develop and implement a number of waste initiatives that will collectively:

- facilitate the shaping of waste and resource recovery policy,
- contribute to the NSW Government 20 Year Waste Strategy,
- provide a sound basis for waste infrastructure planning, and
- deliver progress towards a circular economy.

Councils have been working collaboratively to ensure the critical role of waste management and resource recovery is acknowledged in the planning system and is managed as the critical essential service that it is. Waste management is unique in that it is delivered by local government, under NSW Government strategic direction and in partnership with the private sector.

If not planned for upfront in the planning system, the ramifications for residents and businesses are significant and costly, impacting community safety, local amenity and the ability to divert waste from

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<sup>2</sup> Comprised of WSROC councils: Blacktown, Blue Mountains, Cumberland, Fairfield, Hawkesbury, Lithgow, Liverpool, Parramatta and; non-member councils: Camden, Campbelltown, Penrith, The Hills and Wollondilly.

landfill. This review seeks to ensure the Western Sydney Airport Planning Package has provided adequate waste and resource recovery provisions within the planning framework to deliver sound planning and waste management outcomes.

To deliver sound outcomes for the Aerotropolis, it is essential that the planning framework distinguish between:

- Waste and resource recovery infrastructure such as waste and resource recovery facilities that process or dispose of waste
- Waste management as an essential service delivered by local councils
- Waste management systems within individual developments.

All of these components are interrelated but have distinguishable functions and roles in delivering sustainable waste and resource recovery outcomes. Expansion of these within the Western Sydney Airport Plan (WSAP Plan) would enable the vision and sustainability objectives for the Aerotropolis to be achieved. It would also better support the inclusion of development controls and performance criteria within the SEPP Discussion Paper and the draft DCP Phase 1, and align with the Greater Sydney Metropolitan Plan and Western Sydney District Plan, both of which address the need to plan future waste infrastructure and ensure efficient management of waste and maximise the recovery of resources.

## 2. Western Sydney Aerotropolis Plan

### **WSAP section 2: A Vision for the Aerotropolis**

It is pleasing to see that waste and resource recovery is captured in the vision established for the WSAP:

*“The Aerotropolis is low carbon, featuring next-generation energy, waste and water infrastructure. Circular economy principles minimise waste and pollution, retain water in the environment, reuse energy and regenerate natural systems to increase the tree canopy and urban cooling”* (page 18)

Waste and resource recovery also form part of the sustainability objectives of the plan.

*“Objective 5: A sustainable, low carbon Aerotropolis that embeds the circular economy.”* (Page 9)



These are both positive elements of the Plan, providing high-level recognition that sustainable waste management and waste planning solutions are important considerations that need to form part of the strategic planning process. However, on review of the proposed planning framework, there is little detail as to how this will be delivered or achieved, with no detail for waste minimisation provided. Setting clear planning directions and outcomes that support waste targets would strengthen the alignment with the NSW Waste and Resource Recovery (WARR) Strategy (and support NSW Circular Economy Policy) and give effect to the Western City District Plan.

While the WSAP has sought to provide clarity to support more detailed planning (at precinct planning stage), the inclusion of such broad natured vision, objectives and planning principles relating to waste and resource recovery with limited detail in how they will be implemented and delivered is concerning. The lack of clarity provided within the planning framework on how future development across the Aerotropolis precincts will satisfy the objectives and planning principles within the WSAP may continue to under value the importance of supporting sustainable and effective management of waste.

#### **WSAP section 4: Infrastructure**

Ensuring future urban land-uses are integrated with infrastructure and essential services is crucial in delivering sustainable, livable and productive precincts within the Aerotropolis and across the Western City District. It is concerning that waste and resource recovery infrastructure has not been considered as an essential urban service within the planning framework, and fails to be mentioned in this chapter alongside other key essential services with infrastructure such as energy, water and wastewater.

The WSAP has committed to delivering energy infrastructure. The Plan has also reinforced sustainability objectives and planning principles through a commitment to ensure energy infrastructure satisfies the NSW Government 2050 Net Zero Emissions commitment. A similar commitment should be given to securing and delivering critical waste infrastructure for the Aerotropolis. There needs to be clarity in how vital waste and resource recovery infrastructure will be delivered to inform the precinct planning phase and deliver on NSW Government commitments under the WARR Strategy and Circular Economy Policy. The WSAP infrastructure considerations and planning directions should be expanded to consider waste management driven priorities that:

- Support local councils in delivering waste services across the community.
- Identify and plan specific waste and resource recovery facilities required to cater for the waste generated and support existing policies and waste diversion targets.

#### **WSAP section 6.1: Resilience and Adaptability – Circular Economy**

It is commendable to see the inclusion of circular economy principles noted in the WSAP, and the intent for this to be delivered across the Aerotropolis and that utility provision provides key opportunities. Despite this positive vision, there is failure to follow up within the remainder of the planning framework how this will be planned or delivered. The absence of detailed policy directions or planning mechanisms across the framework that would assist in delivering circular economy principles provides a level of uncertainty as to whether they will be achieved at precinct planning and implemented in development. Providing a clear planning framework upfront would better assist in the delivery of development and land-uses across the Aerotropolis that supports circular economy principles.

The NSW Circular Economy Policy Statement (2019) adopts seven key principles, of which only three generic principles are mentioned within the WSAP. It also fails to make the link between the principle of keeping products and materials in use with the advanced manufacturing opportunities noted throughout the Aerotropolis planning package, and the opportunities this presents to create new jobs.

Expanding the circular economy considerations to include the focus area priorities particularly surrounding recycling, would better support local councils in delivering waste management services across the community and assist achieving waste diversion and reduction targets. This approach and level of commitment would also give greater effect to objectives and planning priorities established within the Western City District Plan.

Similarly, the noted intent to draw from the NSW WARR Strategy to integrate sustainable energy, waste and circular economy design principles into development and operations is commendable, though expected given its importance to the smooth functioning of such a key essential service.

While it is noted that requirements will be determined at the precinct and master planning stages, this is a potential failure of the strategic planning system, as waste management has already been

identified as critical to NSW Government Policy and key deliverables need to be outlined prior to any development being planned.

Similarly, the planning package provides no indication or further acknowledgement how adequately planned waste infrastructure and services will contribute to low carbon precinct aims. There are significant opportunities to develop the Aerotropolis as a low carbon precinct with smarter waste management and resource recovery, particularly through improvements to organics management, waste transport and processing infrastructure.

### **WSAP section 7: Precinct Planning**

The Draft WSAP fosters non-sensitive developments to be located within Airport affected precincts/areas. This approach is supported, with waste infrastructure considered a key potential development within these precincts/areas.

Also, it is positive to see strategic outcomes that will generally apply to all precincts that address key issues in waste and resource recovery management.

The following principle is supported, subject to amendment:

*Enable innovative approaches to resource recovery and waste management, including appropriate urban design for collection facilities.*

This principle does not acknowledge the importance of the Aerotropolis region to waste and resource recovery infrastructure, and the critical need to identify specific waste management facilities required and suitable zones to locate them. It is suggested the wording on this principle is amended to read,

*“Enable innovative approaches to resource recovery and waste management, including appropriate urban design for **waste collection and location of waste processing facilities.**”*

This is critical in securing sustainable waste management functions and resource recovery objectives, however greater detail and clarity is needed now to inform precinct planning. It is concerning that development would be able to be undertaken across the Aerotropolis without precinct planning being finalised. Particularly, as the WSAP outlines that many of the waste and resource recovery details will not be finalised to precinct planning stage.

There are additional principles that are supported, subject to clarification:

- *Embrace new and emerging technologies and support innovation in sustainable and resilient precincts.*

It would be beneficial to the development of a sustainable Aerotropolis that new and emerging technologies in household and business waste management, collection and processing are supported.

- *Enhance the efficient use of energy, water and other resources, and renewable energy generate to achieve net zero emissions for the Aerotropolis.*

This is supported on the provision that “other resources” includes recovered resources, encouraging the recycling of, and use of recycled materials from the Aerotropolis, and other resource recovery efficiencies contributing to reduced emissions.

- *Avoid encroachment of urban development so that future infrastructure does not limit development opportunities or incorporate upfront measures to mitigate noise and visual impacts.*

This principle is confusing and not clear in its intent. It is unclear if this seeks to protect development from noise and visual impacts or infrastructure from urban encroachment, or the ability for early development from future infrastructure needs.

Urban encroachment is a critical issue for users and operators of waste and resource recovery facilities, as encroachment, particularly from residential development is one the key threats to sustaining existing and developing new waste infrastructure. This is particularly pertinent in western Sydney and the Aerotropolis zone, which is home to most of Sydney’s waste disposal and processing infrastructure, with little or no land available elsewhere for the waste industry to relocate. This was acknowledged in the Greater Sydney Metropolitan Plan, of which Objective 23 states,

“Industrial and urban services land is planned, retained and managed...– [which] supports retention of local recycling and waste management facilities.”

This principle should be amended to provide clarity to guide if the intent is protecting from urban encroachment, limitation of development or mitigation of noise and visual impacts. It is suggested that the principle could be amended to read,

*“Avoid encroachment of urban development so that existing and future infrastructure is not impacted and measures are taken to protect new development from noise and visual impacts.”*

The WSAP would also benefit from “liveability” outcomes within the WSAP being expanded to capture waste. Expansion of the liveability outcomes to reference waste management as a key consideration in the design and development of residential buildings is vital in achieving broader resource recovery objectives and maintaining sustainable waste management functions by local councils. The WSAP would also benefit from “productivity” outcomes being expanded to reflect *the Circular Economy Policy Statement*. The value of waste to the economy must be understood and should be reflected within the productivity outcomes for future precincts.

### **WSAP section 7.2: Initial Precincts - Vision and Land-Uses**

It is concerning that waste and resource recovery infrastructure and facilities feature so lightly as a desirable land-use within the initial precincts, given this location is so critical in the functioning of the entire Sydney region in respect to waste disposal and processing.

Currently the WSAP identifies desirable land-uses that could capture waste and resource recovery facilities within the following precincts:

- Badgerys Creek Precinct – “modernised resource recovery industries”.
- Mamre Road Precinct – “circular economy uses”.
- Agribusiness Precincts – “circular economy enabling infrastructure”.

The level of ambiguity surrounding the desirable land-uses (i.e. circular economy enabling infrastructure”) and whether they in fact capture waste and resource recovery facilities is also a concern. There needs to be greater clarity to the role of existing waste facilities, and what ‘modern resource recovery industries’ and ‘circular economy uses’ are.

While the supporting draft SEPP Discussion Paper proposes a Business Enterprise zone that permits waste or resource management facilities (with development consent), there is a requirement for future development applications within each of the zone to ensure consistency with the Structure Plan and how the planning outcomes will be delivered. To support appropriate land-use zones, the WSAP should include within the vision for the relevant precincts the suitability of these precincts to provide critical waste and resource recovery infrastructure. Clearly identifying the suitability of relevant initial precincts for waste and resource recovery facilities has the potential to reduce future land-use conflict. It would assist in ensuring all stakeholders are aware that there is a policy intention for waste

and resource recovery facilities to be located within these precincts. This is paramount given the flexible planning approach adopted within the supporting SEPP Discussion Paper.

The WSAP should also clarify whether the nominated desirable land-uses include waste and resource management facilities, as opposed to just in the proposed SEPP. The WSAP should also use appropriate (and agreed) land-use terminology for waste and resource management facilities. This would support future decision-making on development applications for waste and resource recovery facilities and provide greater certainty for the waste sector in finding suitable sites and gaining approval for these facilities.

#### **WSAP section 8.4: Infrastructure Funding and Provision – Utilities and Services**

This section discusses the collaboration between the NSW Government and utility providers and other stakeholders to develop innovative and sustainable servicing strategies that commit to circular economy principles. It is critical that local government, specifically Penrith and Liverpool councils are included, given their legislated role as municipal waste service providers in the Aerotropolis.

#### ***Recommendations:***

- Setting clear planning directions and outcomes that support waste outcomes and planning principles to deliver effective waste management and transition towards a circular economy.
- Waste considerations therefore must be elevated in the infrastructure (and essential services) planning considerations within the Plan. This would strengthen the ability of future precincts achieving sustainability objectives and planning priorities within the Western City District Plan. The level of priority and detail within the planning framework needs to be akin to that to energy and water considerations.
- Providing a clear planning framework upfront would better assist in the delivery of development and land-uses across the Aerotropolis that support circular economy principles.
- It is suggested that the principles could be amended more accurately to reflect the importance of waste and resource recovery as an essential service in the Aerotropolis.
- The level of ambiguity surrounding the desirable land-uses (i.e. circular economy enabling infrastructure”) and whether they in fact capture waste and resource recovery facilities is concerning and needs to be clarified. To support appropriate land-use zones, the WSAP should include within the vision for the relevant precincts the suitability of these precincts to provide critical waste and resource recovery infrastructure.

### 3. WSA SEPP Discussion Paper

Given the intent of the proposed SEPP, the lack of mention of objectives and development controls within the SEPP Discussion Paper that would support the delivery of sustainable and effective waste management systems is concerning.

The WSA SEPP Discussion Paper, provides the opportunity for waste infrastructure to operate within certain zones, namely the Enterprise Zone. The Enterprise Zone specifically references that a 'waste or resource management facility' is permissible in this zone with development consent. The Enterprise Zone is also seen as a key area for future waste operations in that residential (and other sensitive receivers/incompatible uses) are generally not permissible within this zone (as a result of Airport operational constraints like noise and OLS).

However, there is concern is that the Enterprise Zone is the only zone which allows for a waste or resource management facility. All other zones do not list this as permissible development and therefore under the intended SEPP these operations would be prohibited. This is particularly concerning for precincts such as the Agribusiness Zone, which are anticipated to produce high levels of organic and packaging waste, and the intent of the WSAP to promote circular economy principles.

The *State Environmental Planning Policy (Infrastructure) 2008* (ISEPP) (Division 23) allows for waste infrastructure, where it is otherwise prohibited, to be developed as a mechanism to provide for this essential infrastructure. It is unclear whether the ISEPP would retain its function (particularly in regard to the new zones<sup>3</sup> identified within the SEPP). Regardless, it would be simpler and clearer if waste or resource management facilities are listed as permissible or not in the Agribusiness, Mixed-Use, SP1 and SP2 zones as a minimum.

The WSA Discussion Paper on Proposed SEPP indicates that specific development types and activities in the Aerotropolis would be able to utilise exempt and complying development provisions. Both the ISEPP (Division 23 – waste and resource management facility – specific works) and the Exempt and Complying Development SEPP (Subdivision 12 (container recycling equipment) and Subdivision 39C (waste storage containers) – exempt development) provide important provisions for certain waste

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<sup>3</sup> 4 new zones (Enterprise Zone, Mixed-Use Zone, Environment and Recreation Zone and Agribusiness Zone), that are not found in any current LEPs are to be included in the WSA SEPP.

infrastructure to be undertaken as exempt development. It needs to be clarified if these functions remain, and if not, how these facilities/infrastructure will be developed or provided.

#### **Waste and Resource Recovery – Land Use Suitability and Zoning Feedback**

An overview of the potential land-use and zoning opportunities, and constraints identified within the Package is provided in the table below. Some precincts exhibit land-uses which are suitable for waste infrastructure, but this is not completely reflected within the zoning. Conflicts between described land-uses in the Draft WSAP, and land zoning proposed in the Draft SEPP Discussion Paper need to be considered and amended.

Comments have been made on the suitability for certain proposed land-uses to accommodate municipal waste infrastructure. A general categorisation of waste infrastructure, based on potential impacts (particularly noise, odour/air emissions, traffic and fire hazard) has been applied, namely:

- High intensity – Landfill, Materials Recovery Facility (MRF), Mechanical Biological Treatment (MBT), Waste to Energy<sup>4</sup>.
- Medium intensity – transfer stations, Enclosed Composting (Food Organics and Garden Organics (FOGO)) and Outdoor Composting (Garden Organics - only), Anaerobic Digestion (AD).
- Low intensity – CRCs and Container Deposit Scheme drop off depots and vending machines.

In addition to the above, there are also other potential impacts posed by waste infrastructure that may impact on the Airport operations, such as:

- Wildlife (bird attraction) – would impact on the safety of aircraft movements. The Draft WSAP identifies buffer areas for certain types of wildlife attracting activities. Landfills would therefore need to be strategically located outside these areas.
- Emissions and heat plumes – could impact on the OLS and therefore aircraft movements. The Draft WSAP identifies the areas which would need to maintain OLS restrictions. Waste to energy is considered likely to require a stack (with considerable height and emissions) and therefore would need to be strategically located outside these areas.

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<sup>4</sup> This waste infrastructure is considered to result in high environmental impacts, albeit this type of waste infrastructure has yet to be given approval in NSW. Therefore, there may be concerns with the establishment of this type of infrastructure without considerable mitigation and stakeholder management.



Other specific waste operational impacts would also need to be considered on a merit basis to ensure that they do not impact on the primary function of the Aerotropolis; the Airport.

Precinct	Land-use suitability <sup>5</sup> (As per Draft WSA Plan)	Zoning permissibility <sup>6</sup> (as per WSA SEPP Discussion Paper)
<b>Initial precincts</b>		
Aerotropolis Core (Liverpool LGA)	<p>The Aerotropolis Core is partially affected by Airport operations which is reflected within its dual land-use approach (refer to zoning).</p> <p>The mixed-use area seems to be driven by the location of the Sydney Metro Greater West, and the opportunities to create communities close to station locations (and provide residential area within the Aerotropolis). This area is generally not considered optimum or completely suitable for waste infrastructure, however low intensity waste infrastructure (such as a CRC or container deposit facility) could be considered (on a merit basis).</p> <p>The remainder of the precinct is considered affected by aircraft operations with the area to be characterised by aviation industries (to support the Airport) and educational uses. This area is considered suitable for waste infrastructure (medium to high intensity), however this would still need to be strategically located to minimise impacts on surrounding land-uses. The precinct is intersected by the 'Eastern Ring Road' which provides transportation to motorway network.</p>	<p>Enterprise (north western part) – waste infrastructure permitted (with development consent).</p> <p>Mixed Use (south eastern part) – waste infrastructure prohibited.</p>
Northern Gateway (Liverpool LGA)	<p>The Northern Gateway exhibits a similar land-use approach to the Aerotropolis Core, with specific areas of mixed use (town centres around the West Sydney Metro) and the majority of the precinct being for educational establishments and research and development. This precinct also includes areas of environment and recreation established around waterways.</p> <p>The mixed-use area is generally not considered optimum or completely suitable for waste infrastructure, however low intensity waste</p>	<p>Enterprise (majority) – waste infrastructure permitted (with development consent).</p> <p>Mixed Use (north western part) – waste infrastructure prohibited.</p> <p>Environment and Recreation (throughout</p>

<sup>5</sup> As identified within the Draft WSA Plan.

<sup>6</sup> As identified within the WSA SEPP Discussion Paper. Reflects the proposed zoning, however the potential waste infrastructure to remain permissible under the ISEPP has yet to be determined. Therefore, whether waste infrastructure is truly prohibited within these zones has yet to be confirmed.

Precinct	Land-use suitability <sup>5</sup> (As per Draft WSA Plan)	Zoning permissibility <sup>6</sup> (as per WSA SEPP Discussion Paper)
	<p>infrastructure (such as a CRC or container deposit facility) could be considered (on a merit basis).</p> <p>The majority of the precinct (flexible employment area – Enterprise Zone) is considered suitable for waste infrastructure (medium to high intensity), however this would still need to be strategically located to minimise impacts on surrounding land-uses.</p> <p>The areas identified for environment and recreation are not considered suitable for the development or operation of waste infrastructure as a result of their strategic environmental value to the Aerotropolis and potential (perceived or actual) impacts posed by waste land-uses.</p>	<p>based on waterway locations) – waste infrastructure prohibited.</p>
<p>Wianamatta-South Creek (Liverpool and Penrith LGAs)</p>	<p>The precinct is for the purposes of environmental preservation with the boundaries based on flood impacts (generally the 1:100 year event). This corridor is considered strategically important to retaining and fostering environmental values within the Aerotropolis.</p> <p>As a result of this strategic environmental value to the Aerotropolis and potential (perceived or actual) impacts posed by waste land-uses, this precinct is not considered suitable for waste infrastructure.</p>	<p>Environment and Recreation – waste infrastructure prohibited.</p>
<p>Badgerys Creek (Liverpool and Penrith LGAs)</p>	<p>The precinct is considered highly affected by aircraft operations (i.e. noise and OLS) with the industrial development proposed. This precinct is also intersected by key transport infrastructure (Elizabeth Drive and M12, east-west rail link) and it is close to the Airport.</p> <p>All of the above features are considered relatively conducive to the development and operation of waste infrastructure. This precinct is considered optimum for a waste infrastructure, in particular high intensity operations (landfills, AWTs, potentially waste to energy, etc.) subject to managing impacts on aircraft movements (i.e. wildlife and obstacle impacts posed by certain waste infrastructure).</p>	<p>Enterprise – waste infrastructure permitted (with development consent).</p>
<p>Mamre Road (Penrith LGA)</p>	<p>The precinct is affected by aircraft operations (i.e. noise and OLS) with logistics and warehousing proposed. These land-uses are driven by the proximity to the potential Western Sydney Freight</p>	<p>This precinct is zoned under the State <i>Environmental Planning Policy (Western Sydney</i></p>

Precinct	Land-use suitability <sup>5</sup> (As per Draft WSA Plan)	Zoning permissibility <sup>6</sup> (as per WSA SEPP Discussion Paper)
	<p>Line, Mamre Road and the Airport. Development within the precinct would also need to establish a buffer (and consider) retained rural residential development (Mt Vernon) on the eastern boundary.</p> <p>All of the above features are considered relatively conducive to the development and operation of waste infrastructure. This precinct is considered optimum for a waste infrastructure, in particular high intensity operations (landfills, AWTs, potentially waste to energy, etc.) subject to managing impacts on aircraft movements (i.e. wildlife and obstacle impacts posed by certain waste infrastructure). This infrastructure would also need to manage interfaces with surrounding rural residential development.</p>	<p><i>Employment Area) 2009.</i></p>
<p>Agribusiness (Liverpool and Penrith LGAs)</p>	<p>The precinct is affected by aircraft operations (i.e. noise and OLS) with agricultural related activities proposed taking advantage of a multi-modal (road, rail, air) transport network to provide agricultural products (produced in this precinct and throughout NSW) to a global market. Generally, these uses are considered intensive.</p> <p>Residential land is to be provided strategically in areas not affected by airport operations and through the retention of the Luddenham Village.</p> <p>The precinct is serviced by the Northern Road and the proposed Outer Sydney Orbital.</p> <p>This precinct, as a result of its airport impacts and potential waste generated by agricultural operations (whether this be generated by food production, manufacturing or transportation) could be considered a suitable location for waste infrastructure. This waste infrastructure would need to be strategically located to minimise impacts to strategic residential areas (and other sensitive uses) and prevent agricultural land fragmentation.</p>	<p>Agribusiness – waste infrastructure prohibited.</p>

The range of permissible land-uses within the Enterprise zone can lead to sensitive land-uses in close proximity to waste facilities. Expanding the intent of this zone within the proposed SEPP to accommodate waste and resource recovery facilities is vital in preventing encroachment from sensitive land-uses. Currently this zone permits educational establishments, childcare centres, places

of worship and community facilities. This approach would also assist in providing greater certainty to the waste sector in securing sites within this zone. Additionally, the range of land-uses permitted within the zone and its application across the precincts also has the potential to increase demand for Enterprise Business zoned land. This could be cost prohibitive for the waste sector in securing sites for waste and resource recovery infrastructure.

Care needs to be taken within the Agribusiness Zone that a need for suitable waste facilities and circular economy enabling infrastructure is balanced with the need to ensure there is no fragmentation of agricultural lands, does not undermine opportunities to maintain such land for agricultural purposes or degrade the rural landscape character of these areas with an existing RU1 and RU2 zoning.

The issues discussed above are magnified given the absence of a clear planning intent for waste and resource recovery facilities to be accommodated within these zones given the absence of waste infrastructure objectives. This is further reinforced through the absence of a clear policy approach within the WSAP to identify waste and recovery facilities as a desirable land-use within the relevant precincts, or within any NSW Waste Policy to identify waste infrastructure requirements for the Sydney Metro Area, leaving it to existing facilities, commonly located in the Aerotropolis zone.

The Discussion Paper identifies that the proposed SEPP will contain standalone provisions that cover essential infrastructure provisions. The Essential Infrastructure Provision (detailed in Section 2.11) provides consideration of water, sewer and electrical infrastructure. These provisions also mandate requirements for communication and digital infrastructure. It is disappointing that the importance of waste and resource recovery is not reflected within these provisions or has not been given a separate provision within the SEPP akin to an integrated water management strategy.

The proposed broad approach to land-use zones has the potential to increase the barriers in providing waste infrastructure across the Aerotropolis. These barriers include:

- Limited planning guidance on the potential for land-use zones (and precincts) to locate waste and resource recovery infrastructure.
- Lack of certainty around buffer protection from sensitive land-uses that are permitted within the zones.

- Increase in demand for suitably zoned land with competing land-uses driving an increase in property prices, result in cost prohibitions for waste and resource recovery infrastructure.

**Recommendations:**

- 1) The WSA SEPP should ensure that waste or resource management facility development can be strategically located within the Aerotropolis. This should be either through updating zoning (i.e. allowing for permissibility in suitable zones) regardless of whether the functions of the ISEPP (Division 23) are retained.

In particular, the WSA SEPP (like the ISEPP) should consider the development of waste infrastructure in the following zones (i.e. identified these zones as prescribed zones):

- New zones: Agribusiness and Mixed-Use Zone
  - Existing zones: SP1 and SP2
- 2) That the Essential Infrastructure Provision (detailed in Section 2.11) provides consideration of waste in addition to water, sewer and electrical infrastructure.
  - 3) The clear strategic intent to plan for and accommodate waste infrastructure be noted in the WSAP and ensure consistency across the planning package.

## 4. Draft WSA Development Control Plan (DCP)

It is positive to see that the draft DCP Phase 1 outlines that precinct plans, DCPs (including proponent led site specific DCPs) and development within the Aerotropolis must satisfy the productivity, sustainability, infrastructure and collaboration and liveability principles contained within WSAP.

Additionally, we support the aim of

- (i) *encouraging ecologically sustainable development and reducing the impacts of development on the environment.*

However, these principles need to be strengthened or expanded to drive good waste management outcomes. Given that the WSAP outlined that the requirements for waste design principles for developments will be determined at precinct planning stage, there is a need for the Phase 1 DCP to

include clear objectives and performance outcomes for waste management and recycling. Most critically is the need to support local councils in delivering safe, sustainable and efficient waste collection services and the design of waste management systems within individual developments to maximise resource recovery.

### **Precinct Vision and Place Statements**

The Precinct's Vision Statements and Objectives have started to consider some elements of waste management in their visions and/or objectives, which is pleasing to see. However, there is concern that the fragmentation of the issue has been delivered in broad statements with no direction how waste reduction, circular economy principles or waste and resource recovery management will actually be delivered for the precincts or Aerotropolis lands.

### **WSA DCP section 2.1 and 2.2: Aerotropolis Core and Northern Gateway**

These two precinct visions aim to deliver sustainable residential communities with targets of zero net carbon emissions. Critical to this will be the provision of waste and recycling infrastructure within developments that encourage source separation and resource recovery, and the safe and efficient collection of wastes generated. This Draft Phase 1 DCP fails to address the most critical requirements for municipal waste management, which is the need for integration with councils' waste services. This is vital to ensure that both Penrith and Liverpool councils can service all residential development types in a safe and efficient manner. Councils' role as an essential service provider cannot be underestimated. Where waste management has not been considered upfront in building development, there are significant impacts on community amenity and safety, which would undermine all other efforts made through the planning package to deliver outstanding urban design and liveable communities. Secondly, failure to deliver resource recovery in developments located in the precinct will have significant impact on the ability to meet zero net carbon emission targets and sustainable systems.

### **Recommendation:**

- Vision statement to be amended to include waste as a key consideration, akin to water and energy in its contribution to delivering environmentally friendly precincts.
- A similar objective as what is provided for the Agribusiness Precinct should be utilised in this precinct:

*"Integrate sustainable energy, waste and water as well as a circular economy into development and operations."*

**WSA DCP section 2.4: Badgerys Creek Precinct**

This vision recognises the presence of key waste disposal and processing infrastructure in this precinct. This precinct is home to Sydney's only two municipal organics processing facilities and one of two advanced waste processing facilities. It is also home to one of Sydney's few remaining landfill sites that accept asbestos waste for disposal.

The vision for the precinct notes,

*"Interface treatments will be required between existing resource recovery industries and new land-uses until they transition to other uses."*

It is unclear here if the vision refers to resource recovery industries transitioning to other uses, or new land-uses transitioning to higher order uses.

Western Sydney councils and the Greater Sydney Regional Plan, recognise the need to protect existing waste management facilities, given the existing significant lack of capacity in Sydney's waste disposal and processing infrastructure. The Greater Sydney Regional Plan has a specific objective to address this, with Objective 23 being: *"Industrial and urban services land is planned, retained and managed"* – and specifically references supporting the retention of local recycling and waste management facilities. Critically, this is the only precinct that proposed zoning wholly permits waste infrastructure with development consent. It is imperative that existing waste facilities are retained and managed to enable future use, given the lack of suitable alternate sites in Sydney and significant challenges to develop and new waste infrastructure. Retention of these facilities will also be critical in managing waste from within the aerotropolis site, particularly for organic wastes given the strong aspiration towards zero net carbon emissions and proposed agribusiness activities which are likely to generate significant organic waste. This vision statement would have greater weight if the importance of existing waste facilities to the region and Sydney's productivity and sustainability was also outlined within the DCP.

**Recommendation:**

- Modify vision to recognise the long-term operation of waste facilities in this precinct and their importance to Greater Sydney.

- Objectives need to be expanded to include a specific objective to protect existing resource recovery facilities.

#### **WSA DCP section 2.5: Agribusiness Precinct**

The vision has recognised the importance of waste management solutions and opportunities for delivering a circular economy and innovative utility provision. Objective d) is supported and should be replicated in other precincts. To drive aspirational targets of zero net carbon emissions and circular economy principles, it is recommended that best practice waste management is the minimum requirement.

#### **Recommendation:**

- Expand the current objective (d) to reference “best practice waste” in order to achieve waste management systems that will reduce waste and increase recycling.
- This objective should be applied to all future precincts within the draft DCP. This approach would better align with the WSAP and the Western City District Plan.

#### **Risk, General and Subdivision Provisions**

There is support for performance outcomes that protect potential impacts of the operation of existing waste facilities, including 4.4.2 PO2 on Odour, 4.5.2 PO2 Noise and 5.1.1.2 PO19/20 Land Use Interface. It is pleasing to see a number of general provisions that address waste and resource recovery from a waste reduction and circular economy perspective in 5.1.7.2. However, there needs to be greater acknowledgement of the necessity for new development to integrate with Council’s waste management services and meet their requirements for new dwellings.

This can be done by:

#### 5.1.2: PO6, PO7 and PO14 and 5.4 PO1 and PO2.

It is vital at precinct planning stage and development design that adequate street and laneway widths be provided to ensure new developments can be integrated with Councils waste service. While there can be merit in seeking a reduction in road widths, it must not compromise the ability for new developments to be safely and efficiently serviced by Council. Care needs to be taken in the reliance on the current road width specifications of the Draft Western Sydney Street Design Guidelines, which in current form do not allow for safe and unimpeded access of council’s waste collection trucks or



emergency service vehicles and need further review in this space. These performance outcomes are potentially in conflict with 5.1.7.2 PO18. Similar concerns should be considered for site design and vehicle access arrangements in 5.4 to ensure the safety of waste collection staff and pedestrians.

Planning of street networks needs to ensure that they are safe for all road users, including waste collection and emergency service vehicles. It is not clear in 5.4.2 PO8b) what the design service vehicle requirements are. It is essential that the performance criteria within the DCP support precinct planning that delivers a street network that considers the access requirements for waste collection vehicles. This includes road layouts (no dead ends), turning points, collection points and access for heavy rigid waste collection vehicles.

**Recommendation:**

- Performance outcomes to ensure that any future roadway widths, construction materials and access requirements ensure that it will enable safe access to undertake Councils waste services.

5.1.3 PO9

Waste and resource recovery storage and collection infrastructure needs to be considered upfront in building design, as retrofits deliver poor waste management and resource recovery outcomes. It is important this is factored into the building design stage.

**Recommendation:**

- PO9 should be amended to include facilitation of resource recovery. This could be reworded as, *“Provide innovative and environmentally responsible design that achieves energy efficiency, renewable energy outcomes, facilitates resource recovery, retains water within the landscape and reduces the urban heat island effect.”*

5.1.7. Urban Ecology

Objective e) is supported to encourage the design of buildings that demonstrate circular economy principles. This objective and subsequent performance measures 16-19 need to be supported by standalone Guidelines for waste management that support the DCP and prioritise resource recovery and safe and efficient waste management collection. These can be delivered similarly to the collaborative approach used for the development of draft guidelines for street design referenced in 5.1.2.2. This would help to ensure that the wording used in objective e) “design waste out of developments” is not misunderstood to mean operational waste storage and collection is designed

out of the building design, rather than designing out the generation of waste in design and construction. An excellent example of updated waste management guidelines used in planning controls from the planning partnership membership can be found on Penrith City Council's website and should be used to guide development of waste guidelines for the Aerotropolis zone.

There needs to be greater clarity within the planning framework for the Aerotropolis for a commitment to targets for resource recovery, re-use and recycling noted in PO17. It should not be left to individual developments to establish the resource recovery targets. The targets should be established within the WSAP. This would provide significant policy direction and establish measurable performance outcomes.

**Recommendation:**

- It should not be left to individual developments to establish resource recovery targets in PO17. Rather, these targets need to be embedded across the planning framework for the Aerotropolis.

This is necessary to consider as poorly designed and inadequate waste management facilities in new developments will directly impact upon the state and councils' commitment to achieving WARR targets.

There also needs to be improved guidance to ensure that waste management systems consider other waste streams to garbage and recycling such as organic waste, e-waste and bulky waste. This is paramount in development of medium and high-density residential development, as poor design regularly impacts amenity of active frontages.

It is agreed that the effective management of waste contributes to the visual and physical amenity of the building while limiting potentially harmful impacts on the environment. The incorporation of a performance outcome PO18 that encourages consideration of waste management issues being undertaken early in the design process is welcomed. However, this also needs to be supported by waste management design guidelines to support precinct planning and guide development applications, informed by council's requirements. At minimum, the draft DCP should reference the *NSW Better Practice Guide for Resource Recovery in Residential Developments*, available on the NSW EPA website.

**Recommendation:**

- PO16, PO18 and PO19 should be supported by standalone Guidelines for Waste Management that support the delivery of sustainable, safe and efficient waste management systems that prioritise resource recovery.

To ensure all these well considered performance outcomes are achieved in residential developments, the performance outcomes should be expanded to include a requirement for waste management systems to be integrated with Councils waste service. This could occur under this 5.1.7 Circular Economy section or under 5.3 Servicing and Utilities Servicing.

**Recommendation:**

- Integrate or establish a stand-alone performance measure that requires residential developments to provide waste and resource recovery collection infrastructure and meet servicing requirements that integrate with councils' existing waste collection service.

5.3 Services and Utilities

Waste is an essential service that has not been adequately captured in this section. PO1 should be expanded to also list waste as an essential service to be planned and provided for. PO3 is unclear if the focus is for waste services and networks, or all utility networks with resource recovery hubs used as an example. Similarly, resource recovery hubs needs to be defined, as this could reference colocation of waste facilities with waste generators, a precinct of waste and resource recovery facilities, or community hubs for services such as community recycling centres or container deposit scheme collection infrastructure.

**Recommendation:**

- PO1 be expanded to capture waste as an essential service and provide clarity in wording for intent of PO3. Also see above recommendation for a performance measure to reflect the importance of developments integrating with existing council operated waste collection services.

It is pleasing to see PO8 has captured many of the challenges faced in waste collection, particularly the need for onsite collection in higher density residential and mixed-use developments. It will be

critical to ensure the design vehicle detailed in any waste management guidelines or Phase 2 DCP meets the requirements of Penrith and Liverpool councils.

**Recommendation:**

- PO8 be supported by adequate criteria in standalone Guidelines for Waste Management or draft DCP detail that support safe and efficient onsite collection and integration with councils' waste service for residential developments.

**Subdivisions**

It is understood that performance outcomes will be prepared for subdivision as part of the preparation for Phase 2 of the DCP. To support the delivery of good planning and waste management outcomes, it is essential that the preparation of outcomes and requirements for subdivisions address the need to be serviced by Council's standard waste service upon occupancy of the development. Providing functional subdivision layouts is essential for Council to be able to safely and adequately service new developments and ensure future residents can access Council's waste service.

**Potential Development Types**

The preparation of performance outcomes and requirements for future development types across the Aerotropolis precincts must incorporate waste management systems early in the design process. This process contributes to improved urban design as well as protects future residential amenity. Poorly designed or integrated waste management systems also reduce the ability of developments to satisfy resource recovery objectives, which are essential in creating sustainable and liveable communities.

As such, all developments must be supported by a well-considered waste management plan. A template should be provided and should include mandatory information aligning with waste minimisation and resource recovery targets. The development of guidelines for waste management establish more specific and deliverable parameters to ensure integration with councils' waste service, protection of amenity design criteria and alignment with circular economy principles.

As the WSA DCP does not contain controls typical of most DCPs, these performance outcomes need to be strengthened or expanded as suggested above to ensure that developments are able to integrate with council's waste services, similar to the approach that has been taken in the water management section.

Whilst some of this detail may come in Phase 2 of the DCP, failure to address certain aspects in Phase 1 may result in important considerations for waste management being overlooked in Phase 2, as well as precincts already being developed in the absence of the correct provisions based on the Phase 1 DCP.

Much more consideration and detail need to be given to how these will ensure integration with Liverpool and Penrith Councils' waste services. Although each council offers different systems, there are certain controls common to the waste industry that should be prescribed upfront to ensure that councils are able to service the development, including requirements for building design and adequate street widths. For example, standards must be in place to enable heavy-rigid waste collection vehicles to enter and exit a street or site in a forward direction. (This will also ensure that emergency vehicles such as fire trucks will have safe and unimpeded access to properties.) A building design consideration is that each development is required to provide a bulky goods collection area for the storage of waste until it can be appropriately presented for the council clean-up service, reducing illegal dumping and promoting good amenity of the area.

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<sup>i</sup> Sydney Water. (2018). *Cooling Western Sydney: A strategic study on the role of water in mitigating urban heat in Western Sydney*. Available from: [https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mtty4/~edisp/d\\_d\\_168965.pdf](https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mtty4/~edisp/d_d_168965.pdf)

<sup>ii</sup> Western Sydney Regional Organisation of Councils. (2018). Turn Down the Heat Strategy and Action Plan 2018. Available from: <https://wsroc.com.au/media-a-resources/reports/summary/3-reports/286-turn-down-the-heat-strategy-and-action-plan-2018>

<sup>iii</sup> Sydney Water. (2018). *Cooling Western Sydney: A strategic study on the role of water in mitigating urban heat in Western Sydney*. Available from: [https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mtty4/~edisp/d\\_d\\_168965.pdf](https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mtty4/~edisp/d_d_168965.pdf)

<sup>iv</sup> Resilient Sydney. (2017). *Resilient Sydney Engagement Report*. Available from: [https://www.cityofsydney.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0007/301120/Resilient-Sydney-Phase-II-Engagement-Report-11-FINAL.pdf](https://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0007/301120/Resilient-Sydney-Phase-II-Engagement-Report-11-FINAL.pdf)

<sup>v</sup> CRC for LCL, A Guide to Urban Cooling Strategies, 2017