



SUBMISSION:

Western Sydney Aerotropolis Draft Precinct Plans

NSW Department of Planning, Industry and Environment

Western Sydney Regional Organisation of Councils Ltd.

March 2021

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1. Introduction

Western Sydney Regional Organisation of Councils (WSROC) welcomes the opportunity to provide a response and submission to the draft *Western Sydney Aerotropolis Draft Precinct Plans* 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

This submission is 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 responses.

This submission consists of three key parts:

1. General comments on the draft precinct plan and overarching development process (section 3)
2. Specific comments of heat resilience (section 4)
3. Specific comments on waste and resource recovery, including circular economy (section 5)

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, Mr Charles Casuscelli on charles@wsroc.com.au or 02 9671 4333.

2. About the Western Sydney Regional Organisation of Councils

The Western Sydney Regional Organisation of Councils Ltd. (WSROC) is a membership organisation representing seven councils in Greater Western Sydney (GWS). Members include Blacktown, Blue Mountains, Cumberland, 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.

3. General comments

WSROC welcomes the Precinct Plans' strong focus on sustainable, landscape-led development and we are pleased to see environmental protection, community health and resilience, and urban heat mitigation upheld as key priorities. We commend the Government's vision for the precinct and recognise the Aerotropolis provides a once in a lifetime opportunity to develop world-leading sustainable design and development.

WSROC has identified several opportunities in which the planning documents can be strengthened. These are outlined below.

3.1 Ambitious vision, competing objectives

While WSROC commends the government for the ambitious and visionary nature of the planning for the Aerotropolis and surrounding precincts, we note that many of the objectives outlined in the document are in competition with one another, and compromises will ultimately need to be made. At the core of achieving the vision as outlined, will be the mechanisms that guide how these compromises will be made and what hierarchy of priorities will be set.

For example, the vision for a green, biodiverse landscape offers inevitable conflicts with future aviation operations. Even within the Wianamatta-South Creek Precinct (which is considered the core of greening, regenerative practice and tree cover) land use conflicts are evident. This is acknowledged in the Heat and Sustainability report (p34):

"While this land has been set aside for the blue green grid and it will perform a number of important functions for the Aerotropolis for biodiversity, water it is also likely to fall under Airport restrictions for trees, greening and wildlife – birds." (Heat and Sustainability Report, p.34)

Another example is the challenge of balancing affordable housing with better resilient design while ensuring neither objective is compromised. WSROC recognises the importance of including affordable housing and acknowledges that resilient dwelling design is of greatest importance for low-income households, however ensuring that higher standards can be met while maintaining affordability over the longer term will be a considerable challenge.

No indication of how such conflicts might be resolved has been given. Without this, the goals of a cool, liveable, sustainable precinct are significantly compromised with implications for liveability, resilience and airport operations.

Recommendation:

- That further consideration be given to how the Precinct objectives can be realised, including priorities hierarchy and pathways for resolving conflicts between competing objectives be outlined.

3.2 Local government collaboration

WSROC emphasises that any core infrastructure which councils will ultimately control (e.g. roads, bridges, lighting, canopy, stormwater assets and waste services and infrastructure), must meet the local government standards for maintainability, resource efficiency and essential service delivery. Much of the ongoing management of proposed assets and infrastructure will fall to councils once the bulk of construction is complete. While innovative design is welcomed, it may require additional maintenance and management considerations. Councils should be appropriately resourced through funding and skills-building to ensure they are equipped to maintain and manage such assets and infrastructure. We also stress the need for any assets to be long lasting, affordable, and low impact.

As such, we agree with the *Draft Sustainability and Heat Report's* recommendations (8 and 11) to support, upskill, and improve the capacity of agencies, individuals, and the development industry to deliver this unique and world-class precinct. We would recommend that local government be specifically included in these recommendations given their critical role in the short-, medium- and long-term delivery of the Precinct. This includes planning and compliance, as well as the management and maintenance of assets.

Further, we emphasise that the development of specific toolkits and guidelines for local government as well as other stakeholders will play an important role in the delivery of intended outcomes.

Recommendation:

- That any infrastructure be integrated with council approval processes and standards.
- That councils are appropriately resourced to maintain and manage infrastructure and assets that will fall to them post-delivery.

- That local government be included in programs to upskill and improve the capacity of agencies with a role to play in Precinct delivery.
- That the NSW Government invest in development of clear guidelines and other resources to support successful implementation.

3.3 Flight path protection for existing residential communities and Blue Mountains World Heritage Area.

As outlined in WSROC's previous submissions, it is essential that flightpaths be provided as soon as possible to allow communities and local governments to plan for their impacts. While the objective to "Protect the operations of the Airport, including 24-hour operations, and protect future communities from aircraft noise" (p.40), is to be commended, it must be noted that there are existing communities, and communities currently under construction, who will also be impacted. WSROC expresses its concern and disappointment regarding the lack of certainty that is provided to date on this issue. Without flight paths it is impossible to assess the impacts of flight noise on these existing communities, or to offer protections from such noise impacts.

In addition, lack of clarity regarding flight paths means that impacts of aircraft noise on the Greater Blue Mountains World Heritage Area (GBMWhA) cannot yet be determined or planned for. Protection of GBMWhA is not only a concern for local communities and heritage experts, but for local businesses and the international standing of the World Heritage Area under UNESCO.

Recommendation:

- That flight paths be released as soon as possible so that impacts on existing communities and the Blue Mountains World Heritage Area can be established and mitigated.

3.4 Future airport expansion

Initial plans for the Western Sydney Airport made clear that the airport would be expanded in future via the introduction of an additional runway. In the 2016 Environmental Impact Statement for the project, a second runway was forecast to be required by around 2050. The 2050 scenario has not been referenced in the Precinct Plans and thus it is difficult to assess the impacts this might have on surrounding land uses in future.

Recommendation:

- That the current Precinct Plan references the next stages of the Aerotropolis expansion, including how it will safeguard that the current vision will be upheld when an additional runway is added.

3.5 Healthy, active transport

WSROC commends the government on its commitment to delivering a grid-like street structure which maximises connectivity within 800 metres of the proposed Metro stations. The promotion of active modes of transport is essential for both positive health and sustainability outcomes. Where possible, walkability and connectivity should be further promoted via mid-block pedestrian-only pathways.

The design of public transport networks will also play a critical role in promoting active transport modes. WSROC supports the Precinct Plan Overview's recommended investigation into connectivity between bus and Metro transit modes (p.14). As outlined by Nielsen et al. (2005), interchange points are a critical factor in encouraging public transport use. "Compromises on the design of these points can largely destroy the success of a public transport" (p.16) in terms of network efficiency and attractiveness to passengers¹. Therefore, WSROC recommends that network transfer points should be as seamless as possible, and in the case where wait-times are unavoidable, terminals should be designed to protect passengers from the elements (e.g. shelter, seating and water facilities should be provided to support waiting passengers, this is particularly critical during the summer months).

Recommendation:

- That further investigation into connectivity between bus and Metro transit modes be undertaken.
- That all transport interchanges be supported with facilities that reduce impacts of heat and other weather-related deterrents to public transport use.

¹ Nielsen, G., Nelson, J, Mulley, C et al (2005). Public Transport – Planning the Networks, *HiTrans Best Practice Guide 2*: Interreg IIIB European Union, 2012, Stavanger.

3.6 Agribusiness Precinct Plan

WSROC is pleased that a significant portion of the airport precinct will be preserved for agribusiness. Badgerys Creek and surrounds have long provided a key role in supplying Sydney with fresh produce, and such peri-urban agriculture is expected to become more valuable under future climate scenarios².

With this in mind, the high value of the land in this precinct (due to its proximity to an international airport), makes it critical that precinct planning includes strong protections against residential and industrial encroachment over time.

Recommendation:

- That the function of the Agri-business precinct is maintained via strong planning protections against encroachment via other land uses (e.g. residential and industrial).

3.7 Changes to the NSW planning framework

WSROC notes that the Western Sydney Aerotropolis Draft Precinct Plans are being reviewed in the context of broader changes to the NSW Planning system. For example, the current development of the Place and Design SEPP and the review of BASIX. The Place and Design SEPP will undoubtedly have an impact on the Aerotropolis development. It is currently unclear as to how the Precinct Plan and subsequent development process ensures it can accommodate these new planning instruments.

Recommendation:

- That the Aerotropolis Precinct ensures that it can accommodate the new Design and Place SEPP design standards (incl updated BASIX standards) when these become available.

²Sydney Food Futures. (n.d). Benefits of peri-urban farming. Available from:
<http://www.sydneyfoodfutures.net/benefits-of-peri-urban-farming/>

4. Heat resilience – extreme heat, urban heat and heatwaves

3.1 Introduction

Heat is a major issue for Western Sydney due to its climate, lack of sea breeze, and ongoing development (exacerbating the Urban Heat Island Effect). Urban heat and extreme heat are complex but serious issues which present significant risks to all aspects of our cities (people, economy, infrastructure, and environment). WSROC supports the Government's recognition of the local climatic conditions of the Aerotropolis and associated precincts. We particularly note that:

- extreme heat conditions that are already impacting the area
- the area is not yet impacted by the urban heat island effect – this will come into play as the precincts develop and must be mitigated.

Addressing heat is essential to ensuring the Aerotropolis and surrounding precincts remain liveable, sustainable and economically productive well into the future. Fortunately, Western Sydney Airport (WSA) provides an opportunity to develop a best-practice precinct from the ground up and showcase many innovative approaches to delivering sustainable and cool developments. WSROC sincerely hopes that heat mitigation for WSA will pave the way for heat-resilient developments across the Greater Western Sydney region and Australia.

3.2 General comments regarding heat resilience

WSROC argues that a resilience approach to heat will be critical to ensure the Aerotropolis and its precincts are developed to provide the intended liveability and health outcomes. Such an approach includes:

1. **Awareness:** This involves assessing the physical conditions in the area, and the vulnerability of residents and urban infrastructure to heat.
2. **Reduce:** This involves reducing the effects of both climate change and the UHI, to reduce average ambient temperatures as much as possible in the design and making of the physical environment.
3. **Adapt:** At most, we can reduce ambient temperatures at the city scale by approximately 2°C, which means that high temperatures and heatwaves will still have significant impacts on Western Sydney, particularly as the climate warms. Therefore, it is important to design and

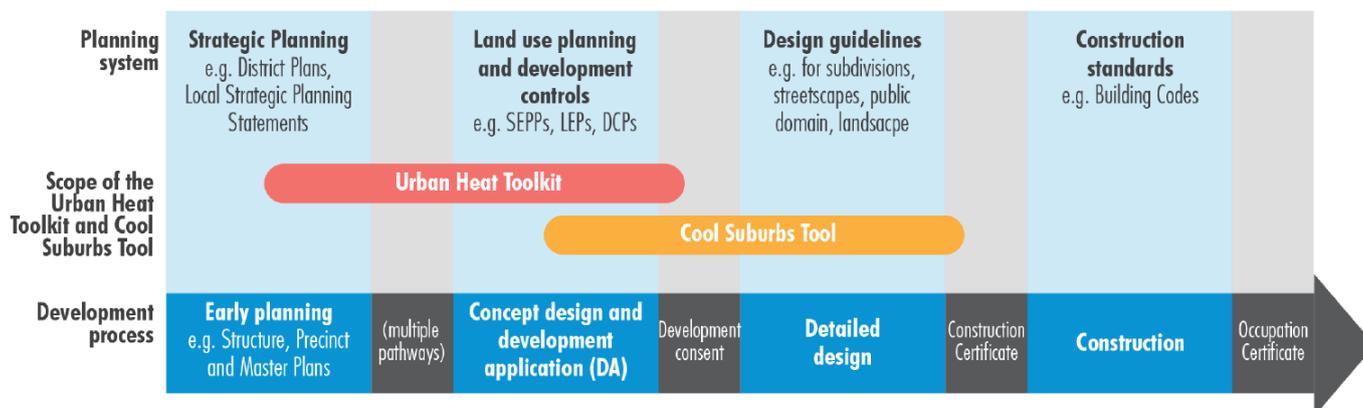
build urban infrastructure that will enable Western Sydney residents to survive heatwaves and thrive in hotter conditions. Adaptation can be broken down into two parts:

- a. Enabling people to thrive in a hotter climate: We need to plan and design urban infrastructure, including buildings, streets, open space and urban systems, to function well in hotter conditions. If people can continue to engage in normal economic, social and physical activities in a hotter climate, it will help reduce the economic and health impacts of heat.
 - b. Enabling people to survive heatwaves: We need to plan and design residential development so that people's homes are safe places in heatwave conditions. This includes improving reliability and affordability of power, as well as ensuring that safe conditions can be maintained even when power supplies fail. If vulnerable people can retreat during a heatwave to a safe environment at home, this will reduce mortality in these extreme events.
4. **Respond:** Even with best practice design, there will still be residual heat-related risk in extreme events. Therefore, we also need emergency preparedness and response measures to help the most vulnerable people in the community.

We note that the draft precinct planning documents go some way to address these aspects (particularly "reduce" and "enabling people to thrive in a hotter climate"), however we express concern (as outlined in the general comments section) regarding competing objectives throughout the documentation, and caution against the risk of heat mitigation and adaptation measures being compromised in the process. In addition, we strongly argue that any high-level intent should be supported by strong design guidelines and principles. In this regard, we specifically refer to the following WSROC projects which can inform better planning and design:

- WSROC Urban Heat Planning Toolkit – developed to strengthen local planning provisions to reduce the impacts of heat (to be released in March 2021)
- WSROC Cool Suburbs Tool – provides design guidance (to be released first half of 2021)

Figure 1. Scope of the Urban Heat Toolkit and Cool Suburbs Tool in terms of stages in the planning and development process. (Copied from the WSROC Urban Heat Planning Toolkit 2021 (p.14)).



Recommendations:

- That a resilience approach to heat management be undertaken, including clear development and design guidelines that support the achievement of the stated targets and objectives. The following work can assist to support the development of these implementation guidelines:
 - **Urban Heat Planning Toolkit** (to be released March 2021)
 - **Cool Suburbs Tool** (to be released first half 2021)

3.3 Assumptions underpinning the Draft Sustainability and Heat Report

The Western Sydney Aerotropolis *Draft Sustainability and Heat Report* is of particular interest to WSROC given its strong alignment with core programs – *Western Sydney Regional Waste and Resource Recovery Strategy*, *Western Sydney Energy Program*, and *Turn Down the Heat Strategy and Action Plan (2018)*. The strong consideration the Report gives to urban heat island mitigation is to be commended, nevertheless, there are several aspects of the document – which form the assumptions underlying the Precinct Plans – that raise cause for concern. Namely:

- The report lacks clarity regarding temperature measures used
- Definitions and origins of cooling measurements remain undefined
- The report does not fully articulate modelling assumptions
- The report uses outdated climate and temperature data.

We support the comments as provided by Western Sydney University’s Dr Sebastian Pfautsch, a summary of which has been outlined in Table 2.

Table 1. Summary of comments on the Draft Sustainability and Heat Report - Western Sydney Aerotropolis by Dr Sebastian Pfautsch, Western Sydney University.

Summary of comments on the *Draft Sustainability and Heat Report – Western Sydney Aerotropolis* by Dr Sebastian Pfautsch, Western Sydney University

The reality of building the Aerotropolis in a naturally hot zone

The scenario described under BAU on page 81 does not include air temperature. Data from the Bureau of Meteorology shows that the current air temperatures for the precincts are already higher compared to other regions in Western Sydney. Yet, the Aerotropolis site and surrounding precincts are currently largely undeveloped and sparsely populated, and as such independent from the Urban Heat Island (UHI) and Heat Vulnerability Index (UVI). Both these measures will change dramatically with the development of the Aerotropolis.

It is therefore critical to assess how changes in land cover and population density will affect mean summer air temperature in this naturally hot zone. Development will introduce more hard (heat trapping) surfaces as well as anthropogenic sources, which will increase surface and air temperatures. Coupled with climate change, this will lead to more days of extreme heat. The impact of building the Aerotropolis in a naturally hot zone is missing in the BAU scenario, reducing the validity of the Leading Industry and Regenerative scenarios.

The need to be realistic about reduction of extreme heat days

The report does not define moderate, strong, very strong and extreme heat stress and associated interventions. There is mounting empirical evidence that extreme heat and heatwave air temperatures cannot be mitigated by any intervention at local or regional scale (except large blue space) (Refer to: <https://doi.org/10.26183/bk6d-1466>.) It is important to be realistic about the actual impact that interventions such as cool roofs, UGI and other interventions can achieve to reduce extreme heat in the region and design guidelines accordingly. Other measures will need to be considered to keep people safe during such events.

Consumption of space and related issues of transport and heat

The current documentation does not provide innovative approaches to urban heat by changing urban design, structure and services across the Aerotropolis. As mentioned in the report, large

blocks of UGI positioned upwind of settlements provide the best cooling benefits. However, the current documents do not provide an analysis that indicates how it will be possible to achieve 40% canopy and green cover, with high quality green space within 10 minutes of each home (as per the Premier's Priorities 11 and 12). It is extremely unlikely that this target will be achieved when taking into account other (competing) land uses (transport, residential, industrial, etc.)

Definitions and origins of cooling degrees are currently undefined

- Page 4 – “7 °C cooling on extreme heat days”. Unclear if air or surface temperature, average or maximum, day or night. How was it estimated?
- Page 80 – “2 °C air temperature reduction in the local heat island effect”. Unclear how blocking of hot winds will reduce UHI effects. How was it estimated?
- Page 99 – “Development precincts to be on average 1 °C cooler during extreme heat days”. Again, surface or air temperatures? Peak, mean, minimum? On average across what? How was it estimated?
- Table 16 – Temperature reductions of 0.5 and 2.0 °C are listed. Unclear if air or surface temperature, average or maximum, day or night. How was it estimated?
- It is unclear how the authors came to the assumption that UTCI will be lowered by 2.5 °C under the ‘Leading Industry Practice’ scenario on page 85. Consequentially, changes in the number of days with and without heat stress (Figure 10) are not informative.

Need for effective implementation pathways

Currently realistic and applicable pathways for urban cooling are not provided. The ‘how to?’ and ‘who?’ remains largely unanswered. While the current principles and their performance outcomes are largely supported, there is a critical need to ensure these are supported with appropriate pathways for effective implementation at scale. Without doing this, we will not be able to progress responsible urban design in a naturally hot landscape.

Based on a significant and growing body of work, WSROC suggests that reducing extreme heat days from 47-19 by 2036, in the context of a warming climate, and in an area where no urban heat island effect currently exists is questionable. Transparency around the origin of cooling degrees and modelling assumptions used in the Draft Sustainability and Heat Report should be provided.

With regards to the recommendations of this report – WSROC agrees that due to the innovative and aspirational nature of the aerotropolis’ vision, specific plans guiding the delivery of targets around soil, urban cooling, share-economy, tree management and renewable energy are required. With regards to heat, WSROC has completed a significant body of work and is in the process of developing *Cool Suburbs Tool* to help guide developers, planners and land managers in the delivery of cool urban spaces. This tool is being developed in partnership with industry and we welcome collaboration with the NSW Government to share outcomes that relate to the Aerotropolis and surrounding precincts.

Recommendations:

- That further baseline studies are undertaken against which success and ‘net positive’ regenerative objectives can be evaluated.
- That all new developments be designed to increase resilience to the growing impacts of extreme heat. Design should combine both energy efficiency (internal) and urban heat mitigating design principles (external), and should include the use of cool materials, greening and water.

3.1 Greening and canopy

WSROC would highlight that the integration and higher levels of greenspace and canopy cover is well supported, however further clarification and guidance is required to assist developers, planners and private land holders in managing the sometimes-competing priorities of urban cooling and biodiversity. The shade and evapotranspiration from all trees is not equal, and often natives – which have evolved to manage extreme heat and drought – offer the least cooling benefit, but the highest biodiversity benefit. For this reason, careful consideration of the right species for the right location and objective is required. We specifically refer to the Which Plant Where program³, which can inform required guidelines.

Recommendation:

- That the stage 2 DCP and Master Plan Guidelines include clear targets, controls and assessment pathways for green space that focuses on quality as well as quantity.

³ <https://www.whichplantwhere.com.au/>

3.2 Orientation

Page eight of the *Draft Sustainability and Heat Report* highlights elements of the built environment, green and blue infrastructure that support heat mitigation and urban cooling. It is evident to WSROC that precinct-level considerations relating to street orientation are not mentioned. Orientation is one of the most important considerations for mitigating UHI at a precinct-level planning. While orientation is referenced in the 'Land Use and Built Form Framework' (Aerotropolis Plan, 2020 p. 119) in relation to energy efficient buildings, the draft Plan should also acknowledge that orientation plays a critical role in (external) urban cooling at the precinct level – with downstream effects as subsequent, block and site-level decisions are made. One of the benefits of developing a greenfield precinct of this scale, is the capacity to deliver optimal orientation to promote urban cooling.

Recommendation:

- That orientation is considered at the Precinct Planning level with respect to urban cooling and capture of prevailing breezes. See advice in the WSROC Urban Planning Toolkit and Cool Suburbs Tool.

3.3 Cool materials

Cool materials are widely acknowledged as an essential part of designing cities that mitigate against UHI. Cool materials include roofing, wall and paving materials which have greater reflectance, less capacity to store heat, and (in the case of paving materials) more permeability.

In 2017, Sydney Water⁴ looked at the role of water in reducing heat at the city scale, finding that

“...combining cool materials and water-based technologies was the most effective strategy to mitigate the negative impacts of urban overheating on ambient temperatures, energy, peak electricity demand, heat-related mortality and thermal comfort” (p.14).

Given the Aerotropolis precincts' exposure to extreme heat, and the acknowledged constraints to canopy cover due to airport operations, WSROC is disappointed to see little consideration given to cool materials (and cool roofs in particular) in the draft Precinct Plans. WSROC acknowledges concerns

⁴ [Cooling Western Sydney](#) (2017)

regarding glare and aviation safety, however high-albedo, non-glare materials are available for this purpose, and should be considered in instances where canopy cover is restricted by airport operations.

Recommendation:

- That cool materials, and cool roofs in particular, be prioritised within the Western Sydney planning instruments and guidelines, whilst maintaining consideration of glare and aviation safety.

3.4 Smart city: Data collection and analytics

WSROC recognises that the Aerotropolis provides a unique opportunity to address issues such as urban heat and extreme heat. Ensuring that impact measurements are integrated as part of the implementation of best practice design would be highly valuable in such a high priority precinct.

Such data could support government processes by:

- Providing real-time data to assess the performance of initial development controls and guidelines – thereby informing better design with flow-on effects for other precincts across NSW and Australia.
- Providing data to inform risk assessments and local emergency planning for heatwaves⁵.
- Allowing governments to target heat mitigation activities (and associated budgets) to areas of greatest need.

And support community resilience via:

- Providing more locally accurate forecast data / warnings prior to heat events⁵
- Enabling community members to check the coolest walking routes and seek out cooler spaces^{5,6}.

⁵ These are key recommendations from WSROC's Heat Smart Western Sydney program which seeks to build heatwave resilience in the region.

⁶ SA Water. (n.d.). *Cooling the community*. Available from: <https://www.sawater.com.au/education-and-community/community-and-events/cooling-the-community>

It would therefore be worthwhile to ensure appropriate data collection and analytics is built into the Precinct from the onset (prior to development). WSROC's draft Cool Suburbs Tool has some specific recommendations in this regard, and we welcome discussions with the Government on this topic.

Recommendation:

- WSROC recommends the Government to consider deploying a network of temperature sensors and data loggers which would provide continuous near surface (2m) air temperature data which is analysed and provided in near real time to citizens to inform individual and community decisions and behaviours that enhance resilience to urban heat.

3.5 Establish a baseline for assessing urban heat

Despite the significant attention heat is given in the *Draft Sustainability and Heat Report*, the resilience objectives the Report outlines for the Aerotropolis (pg. 23) only consider flood. In the context of a changing climate, heat must be considered from a resilience perspective. This should include (but not be limited to) dwellings and public buildings built to passive survivability standards.

It is noted that baseline studies for heat impacts in the precincts have not been conducted as part of the draft Report. While historical temperature data exists, the impacts of such temperatures on human health, local economies and infrastructure has not been assessed. WSROC agrees with the recommendation that the Aerotropolis undertake further research to understand the implications, costs, and benefits of various development scenarios, but suggests taking a further step back to develop a range of baseline studies against which success and 'net positive' regenerative objectives can be evaluated.

Recommendations:

- That further baseline studies are undertaken against which success and 'net positive' regenerative objectives can be evaluated.

3.6 BASIX

WSROC strongly supports the recommendation as posed in the *Draft Sustainability and Heat Report* for the Government to review BASIX targets in the Aerotropolis – as it will assist to plan and design residential development so that people’s homes are safe places in heatwave conditions. Doing so is particularly important to address the Adapt section of the resilience approach (outlined above).

BASIX is an important tool to achieve more sustainable and resilient dwellings, however, the current tool requires a thorough review and update to achieve the intended results on the ground. WSROC believes that an updated BASIX tool will allow NSW to implement best practice development and set itself up as a national leader in addressing heat and implementing sustainability standards.

The recently published *Future Proofing Residential Development to Climate Change* study⁷ shows the limitations of the current BASIX tool and its governance. The study modelled how typical housing in Sydney’s Eastern Suburbs would perform if built to current standards (as per BASIX) and then subjected to future climate conditions, including 2030 and 2070 scenarios. For all dwelling types, cooling loads would increase substantially:

- In 2030, cooling loads increased by 55%-79% above the Baseline Year.
- In 2070, cooling loads significantly increased by 254%-340% above the Baseline Year.

The study illustrates the risk that homes built today will be very difficult to keep liveable in future climate conditions. Noting that this study was modelled on Eastern Sydney’s housing stock and climate data, it can be expected that the results for a similar study in Western Sydney might generate an even higher increase in cooling load due to region’s hotter climate.

The study also found that both energy and water consumption could be expected to increase significantly in the future, with implications for equity, affordability, reliability of rainwater tanks and stability of the electricity grid.

The below excerpt from the WSROC Urban Heat Planning Toolkit⁸ outlines the opportunities to improve the current BASIX tool as identified by councils and our research partners. While some of these recommendations (e.g. the BASIX governance arrangements) will go beyond what can be

⁷ Future Proofing Residential Development to Climate Change, WSP, 2021

⁸ Urban Heat Planning Toolkit, WSROC, 2021

achieved as part of the Aerotropolis precinct planning, many of the recommendations should be considered to inform better practice as part of the precinct planning process.

Table 2. Excerpt from the Urban heat planning toolkit

<p>IMPROVING BASIX</p> <p><i>Existing thermal performance standards</i></p> <p>Building safety, health, amenity, and energy efficiency standards are set across Australia by the National Construction Code (NCC). Maintained by the Australian Building Code Board (ABCB), the requirements of the NCC apply to all new buildings, additions, and major renovations. The code recognises and sets specific requirements for four separate residential building types and six non-residential building types (NCC Building Classifications 1-10).</p> <p>Within the NCC, Section J: Energy Efficiency, establishes the requirements for energy efficiency and ventilation. For non-residential buildings and hotels, Section J directly governs efficiency, ventilation, and comfort requirements. For residential buildings and homes, energy and thermal performance is governed through two sub-codes, BASIX for NSW and the National House Energy Rating Scheme (NatHERS) for all other states and territories.</p> <p><i>Limitations of existing standards</i></p> <p>For residential buildings within NSW, BASIX sets requirements for energy efficiency, water efficiency and thermal comfort. However, the thermal comfort standards in BASIX are not the same as a thermal safety or thermal autonomy design standard. In BASIX, and in the other sub-codes of the NCC, there is no recognition of thermal safety or thermal autonomy as a fundamental objective of compliance. Thermal safety within buildings, let alone during heatwaves, is not identified in any of the Building Codes as a guiding principle or critical outcome.</p> <p>Where the building codes do recognise thermal comfort, they do so in terms of energy use limits placed on heating/cooling systems to maintain that comfort. In BASIX, heating and cooling caps define the maximum load placed on heating/cooling systems to maintain comfortable indoor conditions. This is an indirect measure of a building's thermal performance. While it is possible to choose no active heating or cooling, and meet the BASIX</p>

target based on passive measures, most homes include air conditioning and in these cases, the inherent assumption is that this will function during heatwaves. However, not all homes have functional air conditioning, not all residents can afford to run it, and air conditioning is dependent on reliable power.

Furthermore, the thermal comfort requirements in BASIX are also limited by the fact that peak design conditions (outdoor temperatures) and weather data are out of date and do not reflect the severity nor the frequency of heatwaves experienced now, especially in environments like Western Sydney, which are particularly exposed to heat.

This means that houses or apartment units in NSW, including in Western Sydney, will typically get hotter, faster, than they would if built to more stringent international residential building standards, and if they were built to meet these standards in the context of expected future climatic conditions.

Post-occupancy performance issues

There is also evidence to indicate that in terms of actual post-occupancy performance, many BASIX-compliant homes are falling short of the standards reported in their BASIX certificates. Post-construction monitoring has shown that BASIX-compliant homes are not reliably thermally comfortable, despite the code's intention to deliver comfortable indoor conditions. This partly results from the BASIX assessment method (discussed above), which doesn't directly calculate comfort, instead it calculates peak heating and cooling energy demands as a proxy for comfort.

Furthermore, there is evidence that BASIX substantially underestimates average energy requirements for cooling, particularly in Western Sydney (Ding et al 2019). The same study found that in the homes with high cooling energy use, poor design and build quality were key issues. These poorly performing homes may be failing to achieve thermal comfort or thermal safety. This indicates a potential gap at the compliance stage. This compliance gap is something that councils can potentially improve, noting that there are also limitations to councils' role at the compliance stage, including the widespread use of private certifiers.

Ensuring thermally safe homes

Cool homes are a vital element in addressing the impacts of urban heat, as houses are a key refuge in heatwaves, and need to maintain safe temperatures during extreme events. Current codes and regulations need to acknowledge this.

The concept of thermal autonomy aligns well with existing building codes but can be defined as a distinctly separate thermal safety standard, focused on public health outcomes. This distinguishes it from the energy efficiency and thermal comfort outcomes at the centre of BASIX.

When it comes to cool homes in particular, technical complexity, combined with a complicated planning and regulatory system, makes it challenging to set new standards. However, there is good design guidance on passive design to achieve thermal safety/passive survivability objectives, and new design tools are available to inform better design decision making. There are international precedents for stronger thermal performance standards, and the key question now is how to include similar standards in our planning system. This will only become more important with time, as average temperatures and days of extreme heat both increases.

The NSW Government has suggested a potential review of BASIX targets as part of the Design and Place SEPP. It is unclear how extensive this review may be, but WSROC and councils seek commitment from the Government for substantial improvements to address urban heat and address the shortfalls outlined above.

A substantial revision to the BASIX SEPP and BASIX tool should include:

- Updated climate data;
- Review of all parameters likely to be affected by a changing climate;
- Review available technologies to include new options available today;
- Stronger energy efficiency and thermal comfort targets;
- An additional performance target for thermal safety/thermal autonomy, similar to CIBSE TM 59; and
- The ability for local councils to impose higher or more detailed standards where local circumstances like urban heat stress warrant this consideration.

Recommendations:

- That the Western Sydney Airport and surrounding precincts implement above-BASIX standards to account for the known heat-related risks in this area.
- That the above comments and recommendations are taken into consideration to inform the BASIX standards for the new Precincts.

3.7 Draft Aerotropolis Precinct Plan: Specific comments

The following comments are made on specific elements of the draft Aerotropolis Precinct Plan:

Page	Reference	Comment
65	<p>12 - Consolidate areas of deep soil to ensure pervious soils, with:</p> <p>residential and mixed-use developments having a minimum of 50% site area</p> <p>commercial and business developments having a minimum of 40% site area</p> <p>industrial developments having a minimum of 30% site area.</p>	<p>WSROC fully supports the specification of minimum deep soil, and pervious areas.</p> <p>However it is unclear whether the figures in this objective relate to percentage of the site which must include deep soil, or pervious surfaces.</p>
78	<p>BG4 - To achieve maximum canopy cover in streets (excluding intersections), street trees should have the following minimum mature canopy diameter, taking into account driveways and street movement:</p> <p>large tree = 16m diameter</p> <p>medium tree = 8m diameter</p> <p>small tree = 5m diameter.</p>	<p>WSROC supports the use of mature canopy diameter to define appropriate tree selection. In future iterations of the Plan, DCP and Guidelines may also want to consider specifying the following in addition to mature canopy spread:</p> <ul style="list-style-type: none"> • Mature tree height • Minimum root ball size of newly planted (advanced) trees
80	<p>BG06 - Ensure appropriate soil volume, soil type and water availability to sustain trees planted for urban cooling.</p>	<p>WSROC fully supports this objective.</p>

82	BG11 - Embed water sensitive urban in the street design to allow for passive street tree watering while removing pollutants and reducing stormwater outflow.	WSROC is supportive of this requirement. WSROC, in partnership with Western Sydney University, Melbourne University, Blacktown City Council, Penrith City Council, Stormwater NSW and Sydney Water, is implementing a project which aims to design passive irrigation systems for street trees. This project will be completed in 2022 and we would welcome the opportunity to work with the NSW Government to share results and potentially inform design for the Aerotropolis precincts.
119	20 - Use subdivision patterns to facilitate energy efficient built forms (e.g. building orientation and building footprints).	<p>WSROC recommends changing this guideline to read:</p> <p><i>“Use subdivision patterns to facilitate energy efficient built forms that are resilient to heat (e.g. building orientation and building footprints).”</i></p> <p>Note: Subdivision patterns not only support energy efficiency via solar access but can support urban heat mitigation due to the impact on air-flow and circulation.</p>
125	<p>LUO3 - Design a built form (height and footprint) that:</p> <ul style="list-style-type: none"> matches the character of the place allows smaller footprints on steeper land to minimise soil disturbance and character of topography contributes to the public domain allows solar access to public places is of an appropriate scale to creek interfaces transitions to heritage and other places of significance facilitates sustainable forms of transport and amenity 	<p>WSROC suggests adding to this objective:</p> <p><i>“And minimises impact to the urban heat island effect.”</i></p>

	<p>protects the importance of employment uses in the longer term</p> <p>accommodates appropriate pervious surfaces to contribute to the management of urban stormwater and provide space for trees on lots and in streets.</p>	
125	<p>LU10 - Ensure built form is appropriate for its use and ensure natural cross ventilation, improved internal thermal comfort and reduced reliance on air conditioning.</p>	<p>WSROC suggests to add to this requirement:</p> <p><i>“And minimises its contribution to the urban heat island effect by minimising solar/heat absorption and release and ensuring anthropogenic heat (e.g. heat expelled by air-conditioning units) is directed away from public use areas.”</i></p>
126	<p>LU6 - Provide a minimum of 5% affordable housing in any mixed-use development</p>	<p>WSROC strongly argues that resilient design should be integrated with any affordable housing development. This should be non-negotiable, and off-sets to thermal comfort criteria should not be allowable. It is critical to prioritise passive survivability in housing design in order to respond to extreme heat, particularly for those more vulnerable and least able to afford mechanical cooling.</p>
126	<p>LU7 - Achieve the locational criteria of particular social and public domain uses (such as education, open space, drainage and conservation) as well as neighbourhood and local centres</p>	<p>WSROC recommends that consideration should be given to include guidelines for neighbourhood and local centres to incorporate design that will allow them to become heat-refuges during extreme heat events, allowing people to seek respite.</p> <p>Design for such events should incorporate a range of considerations, for example:</p> <ul style="list-style-type: none"> • air conditioning units that are designed to continue to function at high temperatures (e.g. over 40 degrees), • back-up power supplies • shading (beyond trees) • freely accessible drinking water (via water fountains) • and other design elements that keep people cool and safe.

160	<p>LU1 - Industrial and commercial development is to provide some portion of roofscape for purposes including:</p> <p>solar power to be used on site or linked to the broader energy network of the Precinct</p> <p>rainwater detention for re-use in a closed or open system depending on scale.</p>	<p>WSROC suggests that this requirement should include reference to cool roofs that minimise the impact on the urban heat island effect.</p> <p>Note: This can be achieved through utilising high albedo, non-glare materials to accommodate aviation requirements.</p>
160	<p>LU2 - The appearance, material, reflectivity and aesthetics of the roofscapes should consider the flight path and flight zone.</p>	<p>WSROC notes the safety requirements surrounding the airport, however, we reiterate that cool roofs should remain an important design feature in the Aerotropolis Precincts due to their exposure to extreme heat, and that high-albedo, non-glare materials are available for this purpose.</p>
163	<p>SC10 - Incorporate green infrastructure elements into design and construction to increase the resilience of facilities.</p>	<p>WSROC notes that resilient design will need to go beyond incorporating green infrastructure. We point to the need to ensure people can stay safe during extreme heat events. Design for such events should incorporate a range of considerations, for example:</p> <ul style="list-style-type: none"> • air conditioning units that are designed to continue to function at high temperatures (e.g. over 40 degrees), • backup power supplies • shading (beyond trees) • and other design elements that keep people cool and safe.
171	<p>SRO3 - Set water and energy targets that exceed BASIX.</p>	<p>WSROC supports this objective and refers to more detailed comments made in this document (p18) where we outline key elements to consider.</p> <p>We further note that the NSW Government is working on a review of the current BASIX SEPP and tool. We note that any targets set as part of the Aerotropolis Precinct should be</p>

		<p>able to accommodate the new BASIX SEPP standard or higher.</p> <p>Basing energy and sustainability requirements on the current tool and underpinning data will result in adverse outcomes for the region, with housing that will become unliveable in the not-so-distant future (see BASIX study p18).</p>
172	SR6 - Recognition of air flow, ventilation and appropriate building morphology to support the cooling of the built form and public spaces.	<p>WSROC supports this objective, and suggests the addition of 'orientation'.</p> <p><i>"Recognition of air flow, ventilation and appropriate building orientation and morphology to support the cooling of the built form and public spaces."</i></p>
172	SR7 - Plan for, and achieve, leading industry targets by 2025 and from 2026 beyond to achieve sustainable regenerative targets:	<p>While WSROC supports the requirement to achieve leading industry targets, we reiterate our previous comment: BASIX is currently being reviewed and setting targets based on the current BASIX SEPP is unlikely to achieve best possible outcomes for the precincts. We would recommend that these targets be reviewed or updated post BASIX update.</p>
208	O8 - Use technology and data driven solutions to maximise quality of life across the Western Sydney Aerotropolis, in line with the NSW Smart Places Strategy and Smart Western City Program.	<p>WSROC acknowledges that the new precincts provide an opportunity to integrate data collection and analytics from the onset. We recommend that a network of temperature sensors and loggers are integrated into the smart city model. See for more information our comments on page 17 of this document.</p>

4. Waste and resource recovery

4.1 Introduction

The Western Sydney Aerotropolis is a once in a lifetime opportunity to develop a world-leading sustainable development and we commend the inclusion of circular economy principles in the Draft Aerotropolis Precinct Plan. This is particularly important as Circular economy is predicated on having best practice waste and resource recovery provisions in place.

In WSROC's previous submission (2020) to the Western Sydney Aerotropolis Planning Package, we suggested some improvements to address waste management and resource recovery within the proposed framework and acknowledge the support for these improvements in the current documents.

We have viewed the inclusion of waste and resource recovery principles as positive and have further identified opportunities detailed within this submission, to ensure that these high-level aspirations are translated in the implementation stage.

4.2 General comments regarding waste and resource recovery

The shortfall of the Precinct Plan and underpinning documents is that planning for essential waste infrastructure and services is not given the same consideration as energy and water. By recognising waste as an essential service, the practicalities of how resource recovery and circular economy objectives will be achieved become clear. It is critical that waste is recognised as an essential urban service and that it is given effect in the Plan and related documents.

- There is general support for the draft Aerotropolis Precinct Plans focus on the integration of land use planning with infrastructure delivery. Ensuring future development across a predominantly greenfield precinct is co-ordinated with infrastructure delivery is essential in delivering future urban environments and communities that are liveable, sustainable, and well- connected.
- We commend the NSW Government on its landscape-led approach that will be used to shape the future Aerotropolis and welcome the inclusion of specific urban outcomes that are driven by a sustainability and resilience framework.

- The retention of the link between sustainable practices and the circular economy that featured strongly within the Precinct Plan is highly commended. It is encouraging to see “a circular economy” as a standalone key driver in the planning and development of the Aerotropolis.
- The continued inclusion of statements to drive a circular economy and positive outcomes in systems that avoid waste, reduce resource demand, and recover and regenerates materials across the entire Aerotropolis is well received and a highlight of the draft Plan.
- However, the concerns previously raised in the original Aerotropolis planning package to how these higher-level policy statements translate into and deliver improved outcomes for resource recovery and increased sustainable waste management practices remain. It is unclear how these planning requirements will be received and assessed at development application stage and no clear direction to deliver the well-intended outcomes within future developments.
- The inclusion of specific objectives and requirements within the “Sustainability and Resilience Framework” for the precinct is pleasing and should be commended. The inclusion of leading industry targets by 2025 and sustainable regenerative targets beyond 2026 is welcomed. The only concern is how this will translate to waste avoidance and increase in resource recovery and re-use at development assessment stage. Across the draft Aerotropolis Precinct Plan there is not enough guidance in how these targets can and will be captured and achieved to support a transition to low-carbon precincts and a circular economy at development assessment stage.

4.3 Waste as essential urban service

Waste needs to be recognised as an essential service by all levels of government. Until waste is recognised as an essential service, best practice sustainable waste management cannot be achieved; stifling innovation and progress towards a circular economy.

It is noted that the original WSROC submission to the Western Sydney Aerotropolis Planning Package was critical of the Phase 1 DCP. Concern was raised that the DCP lacked statutory weight and had minimal performance outcomes to drive sustainable and efficient waste management practices within new developments across the precincts.

It was positive to see amendments to the Phase 1 DCP that now includes a number of performance measures that require waste management facilities to be integrated cohesively within building development design and that prioritise waste reduction. It was also encouraging to see that road network and layout design maintain the landscape-led approach to design while ensuring that consideration of waste servicing is undertaken.

The draft Aerotropolis Precinct Plan makes a number of high-level statements to drive the vision for the Aerotropolis such as, “*waste and recycling services in the Aerotropolis and public places should not impact places, workers and residents*” (pp.32). While there is general support for this statement, it is concerning that the overall planning objectives (pp.41) that will be used to guide development and achieve the overall vision across the precincts fail to give any recognition of waste and an essential service and the importance of considering how sustainable and efficient waste services will be integrated within new developments.

It is our view that an additional and standalone objective be included for waste and resource recovery, highlighting that it is an essential urban service and is key to ensuring sustainable and liveable cities. This would elevate the consideration of waste and resource recovery as an essential service and support the positive changes to the Phase 1 DCP. It is noted that standalone objectives for innovative water sensitive design stormwater infrastructure, flood management and natural drainage have been provided.

Recommendation:

- A specific planning objective to be included that recognises that waste and recycling is an essential urban service provided by local councils. The planning objective needs to reflect that the potential impact of waste planning and service delivery on the safety, health, amenity, and well-being of local communities cannot be underestimated.
- To support future development across the precincts delivering the best social and environmental outcomes, waste management must be adequately identified within the planning objectives to achieve both the Aerotropolis and Western City District Vision.
- A standalone objective would:
 - **Strengthen** the application of the performance outcomes contained within the Phase 1 DCP for the Aerotropolis.

- **Escalate** the importance of considering waste planning within the planning framework.
- **Strengthen** the consideration of waste and recycling objectives during the planning, design, and development application process.
- **Align** waste and recycle outcomes with other planning considerations, such as landscape, stormwater, streetscape, and traffic considerations.

4.4 Waste infrastructure

Ensuring future urban land uses are integrated with infrastructure and essential services is crucial in delivering sustainable, liveable, and productive precincts within the Aerotropolis and across the Western City District.

Despite the aspirations towards a circular economy, it is very disappointing that in the draft Aerotropolis Precinct Plan, waste and resource recovery infrastructure fails to be mentioned in any detail. Waste and resource recovery infrastructure is vital to:

- Supporting local councils in delivering waste service across the precincts.
- Identifying and planning specific waste and resource recovery facilities required to cater for the waste generated and support waste diversion targets.

Despite a range of technical studies being undertaken to inform the planning of the Aerotropolis, it is disappointing that there was no critical analysis that directly assessed waste and resource recovery infrastructure needs.

With the current lack of capacity to process metropolitan Sydney's future waste generation (before projected population growth), and the lack of suitable sites for sensitive waste and resource recovery infrastructure, the lack of consideration for waste infrastructure is very concerning.

NSW EPA⁹ suggests that there will need to be at least 16 new waste processing facilities to service Sydney metropolitan's population in 2021. However, with no new waste and resource recovery

⁹ NSW EPA, 2017, *Draft NSW Waste and Resource Recovery Infrastructure Strategy 2017-2021*

infrastructure approved for development, there is no capacity to meet the waste generation requirements of the Aerotropolis and Greater Sydney's growing population.

As we reach landfill capacity and in line with the NSW Circular Economy Policy Statement, energy recovery from waste will be advantageous over landfill disposal. With the latest technology and upmost environmental standards, these facilities, with their modern appearances, are found in the centre of international cities such as Paris and Tokyo. Co-located with high energy users, these facilities can generate sufficient amounts of heat and/or electricity whilst providing much-needed waste processing capacity for the Aerotropolis and surrounding region.

WSROC has also completed work¹⁰ that shows the limited number of suitable sites for advanced waste treatment facilities, yet some of the few remaining locations suitable for a waste to energy facility lie within the Aerotropolis development.

The findings for suitable sites can be replicated using the following site selection criteria (developed by WSROC in consultation with the Department of Planning and Industry):

1. Zoning
2. Sensitive receptors
3. Access
4. Water course proximity
5. Biodiversity
6. Height restrictions
7. Planned infrastructure.

We cannot overlook the practical aspects of planning for essential waste infrastructure in the excitement to progress towards a circular economy. The principle of 'Designing out waste and pollution¹¹' includes:

- Extending the lifespan of existing landfills and reducing demand for new landfills, which will reduce the emission of greenhouse gases and other pollutants.
- Increasing service offerings as well as increased remanufacture and repair activities to minimise the amount of resources used and avoid the generation of waste.

¹⁰ WSROC, 2019, *Preliminary Site Selection Analysis: Waste Facilities in the Western Sydney Region*

¹¹ NSW EPA, 2019, *NSW Government Circular Economy Policy Statement*

To enable this principle, we must consider the range of processing and reprocessing facilities designed for different waste streams (e.g. recyclables, food, garden organics). These all have different planning requirements, and it is important to ensure that these distinctions are made so that the approval is not unnecessarily onerous for less sensitive development types.

Recent changes to the *SEPP (Exempt and Complying Development Codes) 2008* introduced provisions to support recycling facilities for the Container Deposit Scheme as complying development across a range of land use zones. One of these zones was the B4 Mixed Use Zone. It is disappointing that the Mixed Use zone that has been applied to a portion of the Aerotropolis Core would not be able to benefit from the recent provisions within the Codes SEPP that support low intensity recycling facilities (such as an automated counting and sorting centre, drop-off collection point, encased automatic machine, large reverse vending machine, manual collection point and an outdoor express centre).

These facilities are low intensity with minimal environmental impact and should be supported within the Mixed Use zone across the Aerotropolis Core. It is recommended that the provisions of the SEPP Complying Code (specifically part 5B) be applied across the Aerotropolis and the Aerotropolis SEPP amended accordingly to support these facilities. These facilities which support resource recovery and recycling, provide community access to refund points, and are vital in securing the broader vision of the Aerotropolis and sustainability and resilience drivers for the development of the Aerotropolis.

There is an important role for state governments in planning for and delivering essential waste and resource recovery infrastructure to meet the needs of our growing population and to drive innovation and resource recovery outcomes.

There is a real missed opportunity within the detailed planning across the Aerotropolis to guide and support precincts committed to a circular economy. Without any commitment within the precinct planning phase, it is unclear how circular economy hubs will be provided across the precincts.

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. Furthermore, there is a need for vast improvements to our recycling capabilities which rely upon investment in recycling technologies and ensuring that these land uses can be located in regional hubs and supported by an appropriate road network.

Recommendations:

- The level of ambiguity surrounding the desirable land uses (i.e., circular economy enabling infrastructure) and how these hubs will adequately capture waste and resource recovery facilities is concerning and needs to be clarified.
- To support appropriate land use zones, the draft Aerotropolis Precinct Plan should include (within the planning objectives for the relevant precincts) the suitability of these precincts to provide critical waste and resource recovery infrastructure. There should also be clarification on the vision for circular economy hubs and detail how they will function.
- It is noted that the Sustainability and Resilience Framework contained within the draft Plan provides some planning requirements for the establishment of circular economy hubs, however a streamlined assessment process must be provided within the next stage of the planning process to support these land uses. In addition, further clarity on how these hubs and land uses will be implemented and delivered across the precinct is required. This could potentially be explored in more detail within the Phase 2 DCP for the Aerotropolis.
- The draft Aerotropolis Precinct Plan is silent on the need for waste and resource recovery infrastructure for the Aerotropolis. To support the development of a low-carbon precinct and transition towards a circular economy, objectives and requirements should include a specific provision that emphasises the need for essential waste and resource recovery infrastructure to be protected and provided across the precincts.

4.5 Circular economy

There is strong support for establishing the Aerotropolis as a low carbon precinct, driven by circular economy principles. The NSW Government should be commended for the inclusion of 'a circular economy' as a key driver for the Aerotropolis. While WSROC champions the strong focus on a circular economy throughout the draft Plan and there is general support for high level statements such as "*a sustainable urban form requires new ways of design for and enabling development*" (pp.26), we are unsure how these directions and high-level statements will be achieved at development phase.

The draft Aerotropolis Precinct Plan and the adopted Phase 1 DCP includes a number of planning objectives, requirements and performance outcomes that provide a link to circular economy

principles. There is currently nothing in the planning framework that guides the implementation and development of the circular economy hubs. WSROC is concerned the well-intended guiding principles and objectives that feature strongly within the draft Plan lack the support to deliver intended outcomes at the development stage.

The inclusion of a 'sustainability and resilience framework' that provides leading industry targets by 2025 and sustainable regenerative targets beyond 2026 is especially appreciated. However, there is a concern how compliance with these targets will be assessed at development application stage and how any commitments will be enforced.

It is recognised that there is not an existing tool that has been prepared that would assist in simplifying the assessment process and that would allow waste reduction and resource re-use and recovery to be accurately and clearly documented. This is a challenge for the draft Plan that has yet to be overcome.

Recommendation:

To support the delivery of sustainable and resilient precincts it is recommended that clear planning assessment and approval pathways be prepared to support circular economy activities. WSROC strongly advocates for the preparation of design and location guidelines to support and guide the development of circular economy hubs across the precinct. Alternatively, further detail could be provided in the future Phase 2 DCP.

The development of a standalone circular economy guideline would assist in streamlining the planning and approval process for waste and recycling facilities and encourage investment in innovative technology that enables increased sorting, recovery and re-use of resources. WSROC notes that there is currently a lack of current information to guide development and can be relied upon by planning decision makers across state and local government areas.

The development of a guideline would:

- **Support** the assessment of circular economy activities and land uses in a consistent and streamlined manner.
- **Increase confidence** in planning and land use decision makers by enabling them to make decisions based on current information that protect the environment and the community.
- **Provide certainty** within the waste and resource recovery sector given the significant investment needed for the establishment of such land uses and activities as well as overcome

some of the current complexity in the approval pathway for waste and resource recovery facilities.

- **Strengthen the value** and importance of circular economy activities across the community.

WSROC strongly advocates for the development of a standalone guideline or further detail within the future Phase 2 DCP that:

- Considers locations that are appropriate for circular economy activities and resource recovery infrastructure based on function and impact.
- Identifies where circular economy activities be located to maximise efficiency of resource recovery and re-use, support co-location and identifies measures to minimise land use conflict.
- Establish design and operation requirements so that there is minimal impact on the natural and built environment in relation to safety, traffic, and amenity.
- Outlines operation and environmental management requirements to align with best practice.

In addition, WSROC notes that several planning objectives and requirements have been included within the draft Plan to support the sustainability and resilience drivers for the Aerotropolis. WSROC welcomes the inclusion of planning requirements that support opportunities for efficient use of resources to minimise waste and promote circular economy principles into building and infrastructure design and construction.

These planning objectives and requirements are largely welcome, but again, there are concerns with how these outcomes will be achieved at development stage. Currently, there is no consistent framework or tool that can be used across the development assessment process that quantifies and recognises waste reduction and resource re-use and recovery.

It is noted that BASIX provides a streamlined certification process for energy and water across residential buildings and is mandated within the planning regulations. However, there is nothing that currently exists that mandates waste and recycling performance for any new developments. This is a significant challenge of the draft Plan that needs to be overcome.

WSROC further notes that waste management measures are currently included within the NABERS rating system. However, under this Commercial Building Disclosure Program, obtaining a NABERS Energy rating only is mandated, and this is to occur at the sale and lease of commercial office space of 1000sqm. This presents as an opportunity to see an expansion of the scheme or utilise the existing NABERS waste ratings systems which measures how well buildings manage waste and recycling.

WSROC also highlights the opportunity to work with the current traction of the *NSW Government Circular Economy Policy* and mandate requirements for all new developments to be built with specified amounts of recovered and re-used resources. The NSW Government must be a leader in this field and implement procurement practices that mandates using recycled content for construction and infrastructure projects across the Aerotropolis.

WSROC welcomes the opportunity to work with the NSW Environment Protection Authority and Department of Planning, Industry and Environment (DPIE) and relevant agencies to provide input into the preparation of guidelines or performance controls (within Phase 2 of the DCP) for circular economy activities.

4.6 Draft Aerotropolis Precinct Plan: Specific comments

The following comments are made on specific elements of the draft Aerotropolis Precinct Plan:

Page	Reference	Comment
44	Aerotropolis Core, Badgerys Creek and Wianamatta-South Creek Precinct objectives	<p>WSROC supports the range of objectives that have been put forward to create a sustainable and resilient community. It is important that the future Aerotropolis creates an urban community that is healthy and liveable and is driven by minimising its urban footprint.</p> <p>While there is general support for the broad range of objectives that have been provided, it is WSROC's view that the objectives would benefit from an inclusion of a specific objective that gives recognition of waste and recycling as an essential urban service.</p> <p>This would elevate the consideration of waste and resource recovery as an essential service across the entire precinct plan.</p> <p>This direction would also align the precinct plans with the District Plans that have clearly identifies waste and recycling as an important component of Sydney's growth, in terms of urban development.</p>

44	<p>021 Provide for a circular economy hub to ensure waste is reduced, synergies are realised, and resource are circulated back to benefit businesses and communities.</p>	<p>WSROC supports the inclusion of objectives that support the transition to a circular economy. WSROC reiterates that it is paramount for these objectives to be supported by a planning framework that provides further on the approval pathway and a streamlined assessment process for the development of these hubs.</p> <p>A significant challenge for the waste and resource recovery in the establishment of the wide range of facilities is the lack of certainty in the development assessment process. While it is noted that some planning requirements are provided within the draft Aerotropolis Precinct Plan that identify (SR19) requirements for circular economy activities, it does not provide land use decision makers with enough clarity in determining suitable sites for such facilities.</p> <p>WSROC recommends that this shortcoming of the draft Plan be addressed within the development of the Phase 2 DCP for the Aerotropolis. It is noted that the only existing guidelines available to assist in appropriate site selection for waste and resource recovery facilities is extremely dated (1996) and relates only to traditional landfill developments and do not reflect the changes in technology and resource recovery practices and technologies.</p> <p>The draft Aerotropolis Precinct Plan and the supporting Phase 1 DCP do not currently provide any pathway for how the targets referred to will be achieved or the assessment pathway for compliance with these targets that would result in increase in waste avoidance and increase in re-use and recovery.</p> <p>It is recommended that the controls be strengthened in the future Phase 2 DCP and provide increased clarity to how these targets will be realised at development assessment stage.</p>
91	<p>Objective 15</p> <p>Ensure the location and size of loading zones and storage facilities</p>	<p>WSROC supports the inclusion of this planning objective.</p>

	do not compromise the physical or visual amenity of public spaces	<p>It is recommended that this objective be expanded to also specify waste collection services:</p> <p><i>Ensure the location and size of waste collection areas, loading zones and storage facilities do not compromise the physical or visual amenity of public spaces</i></p>
91	<p>Objective 17</p> <p>Large circular economy infrastructure to be located in close proximity to major freight routes.</p>	<p>WSROC supports the inclusion of this planning objective.</p> <p>For the success of circular economy facilities, they must be located close to an efficient transport network.</p>
92	AM 01 Use the transport network to move people and goods safely and efficiently and connect places.	<p>WSROC supports the inclusion of this planning requirement.</p> <p>It is recommended that this planning requirement be expanded to include reference to the transport of waste:</p> <p><i>“Use the transport network to move people and goods (including waste) safely and efficiently and connect places.”</i></p>
92	AM4 Provide a highly efficient road network for private vehicles, freight, and all other modes which focuses on local accessibility in centres where accessibility is critical to network function. Intermediate roads have a balanced focus of access, place and movement.	<p>WSROC supports the inclusion of this planning requirement.</p> <p>It is recommended that this planning requirement be expanded to include reference to waste and recycling services:</p> <p><i>“Provide a highly efficient road network for private vehicles, freight, waste and recycling services and all other modes which focuses on local accessibility in centres where accessibility is critical to network function. Intermediate roads have a balanced focus of access, place and movement.”</i></p>
99	AM02 Create a landscaped, safe, functional, adaptable and integrated street network to achieve the hierarchy of streets and prioritising pedestrian amenity.	<p>WSROC supports the inclusion of this planning requirement.</p> <p>Providing functional road layouts and road design is essential for safe and efficient servicing of new developments and is vital in ensuring future residents have access to councils’ standard waste service.</p>

		<p>Road designs that do not permit the safe and efficient manoeuvring of waste collection vehicles restricts the ability for councils to provide effective waste services that do not detract from both the amenity and safety of the community.</p>
99	<p>AM2 Provide safe and sustainable street grid layouts to enhance connections, accommodate tree planting and retain emergency vehicle accessibility.</p>	<p>WSROC supports the inclusion of this planning requirement as the provision for emergency fire truck access is the same for heavy rigid waste collection vehicles.</p> <p>Ensuring future street layout supports waste and recycling collection services is essential to the success of the precincts. Safe access and manoeuvrability of waste collection vehicles is paramount in council being able to service future developments in a safe and efficient manner.</p> <p>To ensure that future developments can access councils' waste services in an efficient and effective manner consideration must be given to ensure road design is responsive to Councils servicing requirements.</p> <p>WSROC recommends that this planning requirement be expanded to also include safe access for waste collection vehicles:</p> <p><i>"Provide safe and sustainable street grid layouts to enhance connections, accommodate tree planting and retain safe emergency vehicle and waste collection accessibility."</i></p>
102	<p>AM05 Reflect the varied role of streets in urban environments such as public spaces, places for social interaction, service provision, movement connections, water and stormwater management, biodiversity and environmental functions.</p>	<p>It is essential that the future road network is designed so that they also consider the requirements for future waste services that will be provided by local council.</p> <p>It is paramount that the design of the road network cohesively considers waste servicing requirements as a key element in its function amongst other service and utility providers.</p> <p>This includes ensuring that the road design is of sufficient pavement width to enable the safe and efficient manoeuvring of waste collection vehicles.</p> <p>It is also vital that consideration of other elements within the road design such as street trees and</p>

		<p>landscaping, street furniture and street lighting does not impact of the waste collection vehicles manoeuvrability.</p> <p>WSROC is generally supportive of this statement for consideration of road function amongst other urban environmental elements but recommends that the requirement include the considerations surrounding waste and recycling services:</p> <p>Reflect the varied role of streets in urban environments such as public spaces, places for social interaction, service provision, waste and recycling services, movement connections, water and stormwater management, biodiversity and environmental functions.</p>
102	<p>AM2 Develop high order streets that connect people and goods and are fixed in their alignment to ensure efficient movement. High order street can be refined and resolved with further detailed design on intersection and utility planning.</p> <p>Only amend the hierarchy, location or linkage with concurrence from Transport for NSW. Plan for these streets to match their role as outlined in Table 1.</p>	<p>Figure 23 provides a typical sub-arterial road cross section. It is noted from this cross section that a 3.5m travel lane is provided.</p> <p>Concern is raised with the provided travel lane widths and that the 3.5m travel lands are not adequate to ensure that waste collection vehicles can safely and efficiently manoeuvre through the future road network.</p> <p>Ensuring the safe and efficient manoeuvring of waste collection vehicles is essential to ensure all future residential developments can be serviced by the relevant local council.</p> <p>In order to provide a safe and efficient waste collection services and to ensure that local councils standard waste collection fleet can access and service future residential development the travel lane width is recommended to be increased to 4m.</p> <p>A 4m travel lane width is consistent with the road specifications currently applied by Penrith City Council to ensure that new developments can be serviced by Council’s standard waste collection vehicle.</p>
102	<p>AM3 Develop lower order streets in terms of the street hierarchy in Figure 22 and match the identified road width to ensure consistency</p>	<p>Figure 23-28 provides a typical cross sections and layouts of the lower order roads and identify that a 3.3m travel lane is proposed in most instances. The exception being local roads where it is</p>

	<p>across the Aerotropolis as identified in Figures 23 to 28.</p>	<p>identified that the travel lanes can be reduced to 2.8m.</p> <p>This is a significant concern from a waste servicing perspective. Local councils rely on the use of heavy rigid vehicles for waste servicing. These vehicles (and fire trucks) require a 4m travel lane. Reduced road widths as proposed within Figure 23-28 would make it difficult for local councils to undertake waste servicing in an efficient manner and will compromise public safety.</p> <p>In order to provide a safe and efficient waste collection services and to ensure that local councils standard waste collection fleet can access and service future residential development the travel lane width is recommended to be increased to 4m.</p> <p>A 4m travel lane width is consistent with the road specifications currently applied by Penrith City Council to ensure that new developments can be serviced by Council’s standard waste collection vehicle.</p> <p>WSROC is also concerned that there does not appear to be consideration of the functioning of Councils waste collection services within the street design. While the landscape-led approach is largely welcomed it must not compromise the functioning of the local road network and present increased challenges for the collection of waste and recycling.</p> <p>It is recommended that consideration be given to bin presentation areas within the proposed street layouts and street section plans for the precincts. Considering how waste collection will be undertaken, their frequency and how all waste bins are presented for collection is vital in ensuring a cohesive approach to the road network functioning and ensuring that there are minimal visual, and amenity impacts for future residents.</p> <p>Penrith City Council currently requires all new detached housing subdivisions to provide unobstructed bin presentation areas that are large enough to accommodate 2 x 240L bins. The minimum dimensions required are 2m wide by 1m</p>
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		<p>deep. To ensure that waste collection can occur safely and efficiently the bin presentation areas must not be obstructed by driveway access, street trees and on-street vehicle parking.</p> <p>Subdivisions providing smaller lot sizes and reduced lot widths present significant challenges for the operation of Councils standard waste collection service. It is a common experience across both Penrith and Liverpool City Council for smaller lots and lots with reduced widths to be serviced by a rear shared laneway.</p> <p>While WSROC supports the efforts of the draft Aerotropolis Precinct Plan to reduce road widths to counter urban heat impacts it must not compromise the safety and functioning of the road network.</p> <p>The provision of a 7m shared laneway with a 5m pavement width as illustrated in Figure 28 would not enable Council's standard waste collection vehicle (which is often a 12.5m HRV) to safely manoeuvre through the road network. It is recommended that the laneway widths be increased to a minimum width of 7m unobstructed pavement width which would permit a safe waste collection service.</p> <p>Locating utilities and landscaping within rear lanes also needs to consider the required height and manoeuvring clearances of waste collection vehicles.</p> <p>Penrith City Council requires a 4.5m unobstructed travel clearance height for waste collection vehicles.</p> <p>WSROC recommends that the laneway design be amended to reflect servicing requirements of both Liverpool and Penrith City Council.</p> <p>WSROC also recommends that consideration of the provision of bin presentation areas be provided within the laneway cross section. This approach is consistent with the recommendations contained within the NSW EPA Better Practice</p>
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		Guide for Waste Management in Residential Developments.
125	<p>LU03 Design a built form (height and footprint) that:</p> <ul style="list-style-type: none"> • matches the character of the place • allows smaller footprints on steeper land to minimise soil disturbance and character of topography • contributes to the public domain • allows solar access to public places • is of an appropriate scale to creek interfaces • transitions to heritage and other places of significance • facilitates sustainable forms of transport and amenity • protects the importance of employment uses in the longer term • accommodates appropriate pervious surfaces to contribute to the management of urban stormwater and provide space for trees on lots and in streets. 	<p>It is essential in the consideration of waste and recycling facilities for any new developments that they are considered early on in the design process. Objectives and requirements within the precinct plan should support the quality design of waste management facilities that are integrated with and are a cohesive part of any new development.</p> <p>WSROC recommends an additional consideration be included within LU03 to include the provision of safe, efficient and sustainable waste and recycling facilities within the development footprint for medium and high-density developments.</p> <p>This could include the following additional provision:</p> <p><i>“Provide well designed waste and recycling facilities in all new developments to ensure waste management services are safe, efficient, maximise recycling and re-use, and facilities contribute to the built form and liveability of the community.”</i></p>
169	<p>Essential waste and recycling services in the Aerotropolis and public places should not impact on the amenity for workers, residents, and the public such as visually unpleasant waste storage areas, noise, traffic and odours from waste collection services</p>	<p>WSROC supports this statement and the cohesive consideration of waste and recycling facilities within new developments.</p> <p>New developments across the Aerotropolis should set a high standard of design integration for waste and recycling facilities within the development.</p>

		<p>It is recommended that safety of all users be included in this guiding design principle:</p> <p><i>“Essential waste and recycling services in the Aerotropolis and public places should not impact on the safety and amenity for workers, residents, and the public such as visually unpleasant waste storage areas, noise, traffic and odours from waste collection services.”</i></p>
171	<p>SR01 Support opportunities for sustainable and efficient use of resources to minimise waste and deliver a circular economy, and water and energy from development to result in a carbon positive precinct by 2050.</p>	<p>WSROC fully supports this objective and the commitment for the precincts to be carbon positive.</p> <p>The development of targets will be required to support this objective and commitment.</p>
171	<p>SRO2 Transition to a net zero or net positive outcome over the medium to long term, with particular regard to waste management, water management, energy and carbon consumption.</p>	<p>WSROC fully supports this objective.</p> <p>The development of targets will be required to support this objective and commitment.</p>
171	<p>SRO6 Embed circular economy design principles into the buildings and infrastructure throughout the Aerotropolis to maximise the recycling and re-use of materials.</p>	<p>WSROC supports this objective and it is essential in achieving low carbon precincts and working towards the Aerotropolis being a carbon positive precinct that is carbon positive.</p> <p>WSROC recommends that to strengthen this objective with standards that require secondary materials be used where possible be established within Phase 2 DCP.</p> <p>While this may fall outside the planning framework, it is recommended that all levels of government capitalise on this opportunity that the Aerotropolis presents and implement procurements practices to “buy recycled” and that maximises re-use of materials.</p>
171	<p>SRO7 Maximise the use of recovered materials in buildings, infrastructure and the public domain.</p>	<p>WSROC fully supports this objective. It is recognised that there needs to be a significant shift in changing cultural behaviour from a waste management approach to a circular economy where we move towards a zero-waste culture.</p>

		<p>The concern is that currently the Phase 1 DCP does not contain any pathway for how this objective (and similar) will be assessed.</p> <p>The proposed planning requirements (page 173) of the Draft Precinct Plan establish ambitious targets, but it is unclear how this will transition to outcomes at development stage.</p> <p>The Phase 2 DCP presents opportunity to streamline the assessment and provide guidance on how the objectives and requirements contained within Section 3.6 are met.</p>
171	SR08 Collect and transport waste and extractive materials in a manner that is safe, efficient, cost effective and does not negatively impact on liveability and the environment.	WSROC fully supports this objective. It is pleasing to see recognition of the importance of integrating waste and resource recovery services into broader built environment considerations.
171	SRO9 Protect existing recycling and resource recovery infrastructure and identify new locations for waste recycling and circular economy infrastructure.	WSROC fully supports this objective as detailed in this submission.
171	SRO10 Encourage innovative approaches to sustainable design, construction and management of buildings and precincts.	WSROC fully supports this objective. WSROC suggests utilising the existing NABERS waste rating to facilitate this.
171	SRO11 Facilitate the design, construction and operation of environmentally sustainable buildings and precincts, including energy efficiency, renewable energy, efficient resource and energy use and reduced emissions and waste.	WSROC fully supports this objective. WSROC suggests utilising the existing NABERS waste rating to facilitate this.
171	SRO13 Recognise waste as a resource and the collection and transport of waste and recycling as an essential service that must be undertaken in a manner that is safe, efficient, cost effective and does	WSROC fully supports this objective. It is pleasing to see waste and recycling being identified as an essential service within the planning framework.

	not negatively impact on liveability and the environment.	
171	SRO14 Facilitate and support a circular economy around repair, re-use, recycling, remanufacturing and reprocessing.	WSROC fully supports this objective.
171	SRO15 Embed circular economy design principles into the buildings, public domain and infrastructures throughout the Aerotropolis to maximise the recycling, recovery and re-use of materials	<p>WSROC supports this objective. However, we are concerned how these promising objectives will translate to improvements in waste avoidance and resource re-use and recovery at development stage.</p> <p>The planning systems currently uses BASIX as a tool to measure and commit to water and energy savings that can be readily applied and assessed at development assessment stage.</p> <p>Unfortunately, there is not a similar tool available that guides waste and resource recovery within developments so achieving these objectives may present a number of challenges at development assessment stage.</p> <p>It is recommended that Phase 2 of the DCP set clear parameters and pathways for how these objectives (and requirements) can be achieved.</p>
173	SR1 Utilise sustainable energy, water and waste systems to encourage a circular economy that improves efficiency and results in low-carbon developments.	<p>WSROC supports this planning requirement however cautions that the current planning framework does not provide any guidance to support the development of circular economy activities.</p> <p>WSROC is concerned given the lack of guidance at development assessment stage available to land use decision makers, the development sector and waste and resource recovery industry that the intended outcomes (while positive) will not be achieved.</p>
173	SR3 Ensure waste and recycling collection infrastructure is integrated within developments and where possible across separate developments while addressing storage, safety, efficiency, accessibility to waste, re-use and	WSROC supports the inclusion of this planning requirement that acknowledges design of waste and recycling infrastructure and facilities need to be considered holistically in the planning and design stage of developments. This is also an opportunity to develop precinct-level waste and resource recovery solutions (e.g. underground

	<p>recycling services without compromising the safety and amenity of the public domain.</p>	<p>vacuum systems) which supports this requirement.</p> <p>Consideration of waste and recycling infrastructure and facilities early in the design and planning phase of the development is where optimum resource recovery outcomes can be achieved, and systems are designed to ensure that they are compatible with councils' standard waste service without adverse impacts on both the natural and environment.</p> <p>WSROC would welcome the expansion of this planning requirement to include reference to ensuring waste and recycling facilities ensure that they are integrated with councils' standard waste service:</p> <p><i>"Ensure waste and recycling collection infrastructure is integrated within developments and where possible across separate developments while ensuring they can be integrated with councils' standard waste service and address standard storage, safety, efficiency, accessibility to waste, re-use and recycling services without compromising the safety and amenity of the public domain."</i></p>
173	<p>SR4 Ensure waste collection, power and water use, where relevant and possible, is communicated throughout to encourage the creation of sustainable regenerative outcomes.</p>	<p>Waste and recycling is an essential service provided by councils under the <i>Local Government Act 1993</i>. It is an essential urban service that is provided to every residential household.</p> <p>The potential impact of waste planning and service delivery on the safety, health and amenity of the local community cannot be underestimated.</p> <p>WSROC supports the inclusion of this planning requirement and recommends that further detail be provided within the Phase 2 DCP to ensure that the design of waste and recycling infrastructure and facilities are integrated to support the delivery of Councils standard waste service.</p>
173	<p>SR5 Develop integrated systems for energy generation – waste and water.</p>	<p>WSROC fully supports this planning requirement.</p>

173	<p>SR7 Plan for, and achieve, leading industry targets by 2025 and from 2026 beyond to achieve sustainable regenerative targets:</p> <table border="1" data-bbox="336 521 780 965"> <tr> <td data-bbox="336 521 461 965">Circular economy targets</td> <td data-bbox="461 521 624 965">10% reduction of waste generation</td> <td data-bbox="624 521 780 965">100% recovery and re-use of organic waste</td> </tr> <tr> <td data-bbox="336 770 461 965"></td> <td data-bbox="461 770 624 965">85% reduction in construction waste</td> <td data-bbox="624 770 780 965">90% reduction in construction waste</td> </tr> </table>	Circular economy targets	10% reduction of waste generation	100% recovery and re-use of organic waste		85% reduction in construction waste	90% reduction in construction waste	<p>WSROC fully supports the inclusion of circular economy targets within the draft Aerotropolis Precinct Plan.</p> <p>However, the current requirements and supporting planning policy across the adopted planning package do not give any indication on how these targets will be achieved or measured.</p> <p>There is opportunity within Phase 2 of the DCP to address this and provide a clear assessment pathway for how these targets (and additional planning requirements) will be satisfied at development stage. Additional tools are needed to meet these aspirational outcomes on the ground.</p>
Circular economy targets	10% reduction of waste generation	100% recovery and re-use of organic waste						
	85% reduction in construction waste	90% reduction in construction waste						
173	<p>SR8 Development to prioritise procurement of building materials from within a 30km radius of the development site, where feasible.</p>	<p>WSROC supports this planning requirement. We note that there currently is insufficient detail within the current planning package and the draft Aerotropolis Precinct Plan regarding how this will be implemented at development assessment stage.</p>						
173	<p>SR9 Circular economy activities must be located in appropriate locations with consideration given to:</p> <ul style="list-style-type: none"> • adjacent land uses, considering the likely construction and operational impacts of the proposed development in order to prevent land use conflict • proximity of the proposed development in relation to the Airport, and associated risks to airport and aircraft operations (in reference to the proposed development’s risk assessment) alignment with land use zone 	<p>WSROC supports this planning requirement.</p> <p>It is recommended that further guidance be provided in a standalone guideline document or alternatively detailed controls be provided within the Phase 2 DCP.</p> <p>While these considerations are welcomed, it is recommended that a standalone guide be developed in partnership with key stakeholders such as the EPA to support the location and design considerations.</p> <p>This would strengthen the confidence of land use decision makers such as planners across state and local government as well as provide additional certainty to the private waste and resource recovery sector.</p>						

	<p>objectives, including adjacent land uses</p> <ul style="list-style-type: none"> • proximity to Environment and Recreation Land Use zone and potential impacts to public space and its useability • proximity to major transportation routes, considering safe transportation of extractive and waste materials. 	
173	<p>SR10 Waste or resource management facilities should be located within an acceptable distance from the servicing customer base.</p>	<p>WSROC supports this planning requirement and the proximity principle is an important aspect of sustainable waste management. However, given the limited planning and critical analysis of waste and resource recovery infrastructure needs for the Aerotropolis it is unclear how this planning requirement will be satisfied.</p>
173	<p>SR11 The distances from a circular economy activity to material processing plants or landfills should be minimised.</p>	<p>WSROC fully supports this planning requirement. It is recommended that the Phase 2 DCP include additional requirements about co-location and how future circular economy hubs will be encouraged.</p>
173	<p>SR12 An appropriate buffer distance should be kept between the circular economy activity and residential areas or other sensitive land uses.</p> <p><i>An appropriate buffer distance is a distance which can be demonstrated to prevent unmitigated environmental nuisance.</i></p>	<p>WSROC fully supports this planning requirements that recognises the importance in minimising future land use conflicts and protecting investment in resource recovery.</p>
173	<p>SR13 Any circular economy or extract industry activities involving filling of land, including approved activities that have resulted in a change in landform, upon completion of the approved activity, the landform is to be returned to its original state</p>	<p>WSROC supports this planning requirement.</p>

	<p>through the use of Virgin Excavated Natural Materials (VENM) or Excavated Natural Material (ENM) or other soils under a specific resource recovery order and exemption.</p> <p><i>Note: Any material received for this purpose must be validated by a suitably qualified independent person to demonstrate that it is VENM or meets the requirements of the relevant resource recovery order/exemption and is fit for its intended purpose.</i></p>	
173	<p>SR14 Development must be consistent with circular economy principles as defined in the <i>NSW Circular Economy Policy Statement</i>.</p>	<p>WSROC supports this planning requirements and welcomes additional planning guidance on how this requirement will be achieved and delivered intended outcomes within Phase 2 of the DCP.</p>
173	<p>SR15 Incorporate Public Place Circular Economy Infrastructure into large commercial and mixed-use developments to ensure adequate opportunity for people to participate in re-use and recycling schemes</p>	<p>WSROC fully supports this planning requirement.</p> <p>WSROC supports the inclusion of further detail within the Phase 2 DCP to support access to and increased use of re-use and recycling schemes across the precinct given the success of the incentive-based Container Deposit Scheme in NSW.</p>