

Implementation Guidance Document

Incorporating Urban Heat Objectives into Planning Policy

Sydney is and will continue to experience significant urban growth, both in the form of urban release and renewal development. These urban areas create their own microclimates through influencing the surrounding atmosphere and interacting with climate processes. This is known as the urban heat island effect, and which results in higher air temperatures in urban areas than those in surrounding non-urban areas. Through urban development we are, in effect, modifying our local climatic conditions and environments.

The District Plans clearly identify urban heat as an important component of Sydney's growth. The release of the District Plans has now also highlighted a significant gap within the planning policy framework. Some councils have relied on Development Control Plans to implement urban heat outcomes. However, there is now a real opportunity for councils to escalate and incorporate urban heat objectives into their Local Environmental Plans to strengthen the consideration of urban heat and associated cooling design requirements early in the development assessment process.

It is important that urban heat provision are also incorporated in the Local Strategic Planning Statements to ensure the aspirations and expectations of the community are embedded into the planning policy framework.

Purpose

This document has been prepared to assist council officers to escalate the importance of urban heat outcomes by incorporating them into Local Strategic Planning Statements and Local Environmental Plans as part of the recent NSW Government planning reforms to support *A Metropolis of Three Cities – the Greater Sydney Region Plan* and the District Plans.

What we need to achieve

- **Escalate** the importance of urban heat outcomes within the planning policy framework.
- **Strengthen** the consideration of urban heat objectives during the planning, design and development application process.
- **Align** urban heat outcomes with other planning considerations, such as landscape, traffic, parking etc.
- **Inform** and guide applicants/developers of the importance of urban heat early in the planning and development stage.

Why we need to do it now

- Mandated by changes to the NSW Planning legislation – LEP's must give effect to the District Plans (which specifically identify urban heat objectives/actions).
- The process has commenced and is due for completion in June 2020. However, the consideration of urban heat objectives needs to be undertaken and implemented prior to the finalisation of the Local Strategic Planning Statements (which are currently under preparation) and the Planning Proposal to support the LEP Review (due to commence March 2019). If this opportunity is missed now, it could be several years before changes could be incorporated in your council's LEP.

Timeframe

Timing is critical. The Accelerated LEP Review timeframe is illustrated in Figure 1 below, which clearly highlights the urgent need to secure urban heat provision within the Local Strategic Planning Statement which is currently in preparation, and prior to the preparation of the Planning Proposal to support the LEP Review. Figure 2 below illustrates the relation between the different strategic documents, clearly indicates that the Local Strategic Planning Statement needs to inform the LEP.

These draft documents may be well advanced in some councils. Ideally, it would be beneficial to include the urban heat provisions within these draft documents prior to public exhibition to acknowledge council has considered the importance of urban heat, and to ensure the community has the opportunity to review the provision and potentially reinforce their inclusion.

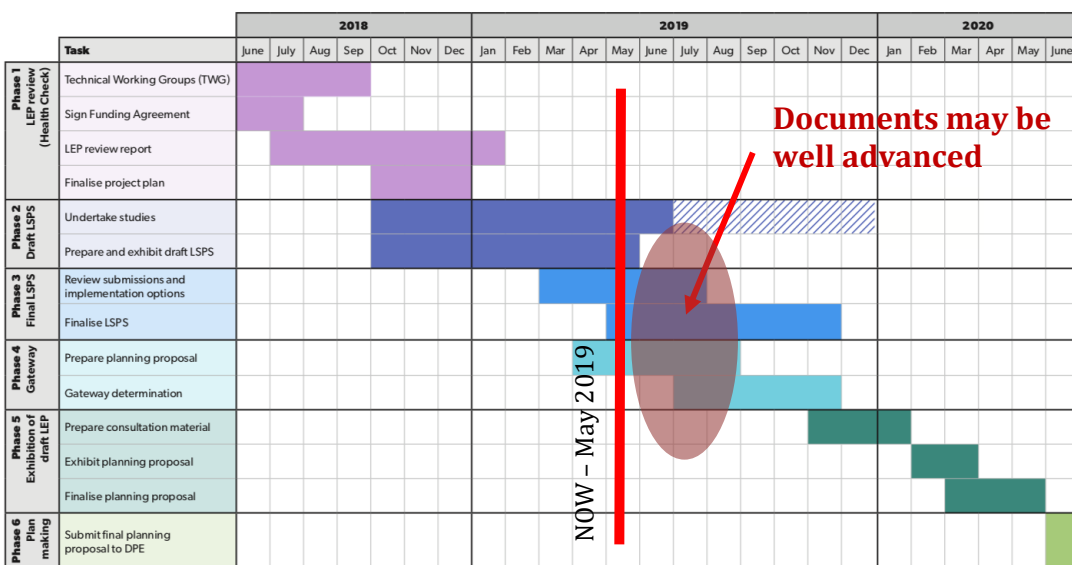


Figure 1: Timeframe for the LEP Review

Source: Greater Sydney Commission, LEP Roadmap – Guidelines for updating Local Environmental Plans to give effect to the District Plans in the Greater Sydney Region, May 2018



Figure 2: Relationship between Regional, District and Local Plans

Source: Western City District Plan

It is important to note that council's project team (either internal or an external consultant) working on the LEP Review will also be focused on other matters, including the preparation of their Housing Strategies and Employment Lands Studies, the engagement of the community and key stakeholders, and council's own internal reporting deadlines to meet specific deadlines. It is therefore critical that urban heat objectives are raised and included as soon as practical.

Potential obstacles

You may experience some resistance to the inclusion of these provisions as part of the current planning reforms (LEP Review purpose). If that is the case, you need to reinforce the following points:

- **Statutory Requirement** – The District Plan specifically mentions urban heat objectives/actions. Therefore, by virtue of clause 3.8 (3) of the *Environmental Planning and Assessment Act, 1979*, each council to which the district plan applies **must** review their local environmental plan(s) for the area and prepare a planning proposal **to give effect** to the District Plan.
- **Restricted Timeframe** – Some councils may hesitate to incorporate these urban heat provisions into draft LSPS and Planning Proposals for the LEP Review due to time restrictions. However, it is important to incorporate as much information and potential provisions within the draft documents prior to the public exhibition period. This will ensure the community has an opportunity to consider and respond to the proposed objectives/actions.

District Plans

The Greater Sydney Commission's five District Plans are a guide for implementing *A Metropolis of Three Cities* - the Greater Sydney Region Plan at a District level. These 20-year plans are a bridge between regional and local planning.

The District Plan informs Local Strategic Planning Statements and Local Environmental Plans, the assessment of planning proposals as well as community strategic plans and policies. The District Plan also assists councils to plan for and support growth and change, and align their local planning strategies to place-based outcomes. It guides the decisions of state agencies and informs the private sector and the wider community of approaches to manage growth and change.

The District Plans acknowledges urban heat in Greater Sydney. It identifies planning priorities, objectives and actions, focused on managing urban heat and other associated actions to protect and enhance the future amenity and health and wellbeing of the community.

The planning and design of new developments should consider urban heat through design excellence and sustainable built form outcomes.

Way forward

Immediate (Urgent)

- Ensure inclusion of an urban heat statement within the Local Strategic Planning Statement, see Attachment 1 for suggested wording.
- Explore opportunities to strengthen or expand attached statements to increase urban heat information for your specific council.

Mid 2019 (May to July)

- Review and explore **urban heat clauses** for inclusion within the LEP Review, see Attachment 2 for possible wording.
- Develop appropriate urban heat wording for inclusion within the **Planning Proposal** that will be prepared to support the LEP Review process. The wording needs to justify why urban heat provisions are required within the LEP. This will include:

- A link to the priorities, objectives and actions within the District Plan.
- A link to the Local Strategic Planning Statement (with urban heat provisions included).
- The expected type of development within the local government area, and the associated urban heat implications.
- Highlighting the need to consider council's current operations to protect the safety, amenity and lifestyle of the residents and community.
- Reference to any other council-adopted documents, strategies, and policies to provide urban heat targets.

Additional support

If you require any additional support or guidance over the coming months, please do not hesitate to contact:

Judith Bruinsma

WSROC

judith@wsroc.com.au

(02) 9671 4333

Milan Marecic

Boston Planning

milan@bostonplanning.com.au

0418 674 124

Attachment 1:

Local Strategic Planning Statement – Option 1

It is recommended that each council tailor the responses to suit their specific internal needs and community aspirations.

Sydney is and will continue to experience significant urban growth, both in the form of urban release and renewal development. These urban areas create their own microclimates through influencing the surrounding atmosphere and interacting with climate processes. This is known as the urban heat island (UHI) effect, which results in higher air temperatures in urban areas than those in surrounding non-urban areas. Through urban development we are, in effect, modifying our local climatic conditions and environments.

The UHI effect is expected to increase in Sydney as urban development continues and temperatures increase with climate change. Urban release areas will experience significant increases in roads, roof tops and driveways, while urban renewal areas will see intensification of land uses and hard surfaces, both horizontally and vertically. These urban surfaces absorb, hold and re-radiate heat; raising the temperature in our urban areas. This effect is often worsened by development activities when green spaces are significantly reduced and replaced with more hard surfaces that absorb heat, and where medium to high density development adds to the creation of street canyons that trap heat and increase night and day time temperatures. Increased urban densities and human activities such as traffic, industry and electricity usage, particularly air conditioning usage, generate additional heat, further exacerbating the UHI effect.

Many communities across NSW and particularly those living and working in urban areas and town centres are being exposed to increasing heatwave conditions with average maximum temperatures several degrees warmer than those being experienced in adjacent rural areas. The elderly, children, those with existing medical conditions and the disadvantaged are particularly vulnerable as many are without substantial cooling options. Heatwaves kill more Australians each year than any other natural disaster and place an additional substantial burden on the economy. For those that can afford air-conditioning, heatwaves will lead to increased energy costs, placing additional financial burdens on tightening household budgets. Heatwaves are also placing considerable stress on the natural environment, particularly plants and animals, and increasing the temperature of urban waterways and creeks.

The mitigation responses to urban heat require various design and construction techniques, material selection and green and blue infrastructure.

Objective

The community have expectations and aspirations for environments that are comfortable and pleasant, visually appealing and that contribute to their health, safety and well-being. To achieve this, the effects of urban heat need to be considered and addressed. Heat needs to be reduced and removed from the urban environment through building and urban or city design, material selection and the protection and increase in green infrastructure.

Council will implement controls to address urban heating, including:

- Reflectivity of building roofs, paved surfaces, podiums and facades;
- Increase and protect vegetation, particularly appropriate canopy species, in the urban environment;
- Reduce the impacts of heat rejection sources of heating and cooling systems;
- Encourage suitable wind flows and circulation through urban areas;
- Increase the use of WSUD principles and pervious surfaces to assist in the use and reuse of water for cooling in the urban environment; and
- Increase shade to hard surfaced areas.

To tackle urban heat, all levels of government will need to align building and city design and planning requirements to cool the built environment. At a state level amendments to BASIX and SEPPs (including exempt and complying development) Local Environmental Plans (LEPs) and Development Control Plans (DCPs) will be required, as will Federal Government amendments to NatHERS (Nationwide House Energy Rating Scheme) and the National Construction Code.

Local Strategic Planning Statement based on template – Option 2

It is recommended that each council tailor the responses to suit their specific internal needs and community aspirations.

Sustainability– (Central City District Plan/Western City District Plan/Northern City District Plan)

Direction	Planning Priority	Objective	Action
A city in its landscape	Planning Priority (C16/W15/N19) Increasing urban tree canopy cover and delivering Green Grid connections	Objective (30/30/30) Urban tree canopy cover is increased	Action (68/73/71) Expand urban tree canopy in the public realm.
	Planning Priority (C13/W12/N15) Protecting and improving the health and enjoyment of the District’s waterways.	Objective (25/25/25) Coast and waterways are protected and healthier	Action (60/61/62/63) Improve the health of catchments and waterways and protect environmentally sensitive areas. Work towards reinstating more natural conditions in highly modified urban waterways.
An efficient city	Planning Priority (C19/W19/N21) Reducing carbon emissions and managing energy, water and waste efficiently	Objective (33/33/33) A low-carbon city contributes to net-zero emissions by 2050 and mitigates climate change.	Action (75/81/74) Support initiatives that contribute to the aspirational objective of achieving net-zero emissions by 2050, especially through the establishment of low-carbon precincts in Growth Areas, Planned Precincts, Collaboration Areas, State Significant Precincts and Urban Transformation projects.
		Objective (34/34/34) Energy and water flows are captured, used and re-used.	Action (76/82/75) Support precinct-based initiatives to increase renewable energy generation and energy and water efficiency, especially in Growth Areas, Planned Precincts, Collaboration Areas, State Significant Precincts and Urban Transformation projects.
A resilient city	Planning Priority (C20/W20/N22) - Adapting to the impacts of urban and natural hazards and climate change	Objective (36/36/36) People and places adapt to climate change and future shocks and stresses.	Action (81/87/80) Support initiatives that respond to the impacts of climate change.
		Objective (38/38/38) Heatwaves and extreme heat are managed	Action (83/89/82) Mitigate the urban heat island effect and reduce vulnerability to extreme heat.

Sustainability

A city in its landscapes: Planning Priority C16/ W15/N19

Increasing urban tree canopy cover and delivering Green Grid connections.

The information provided below are examples only. Each council would be required to tailor the input to each section to match their own corporate and operational needs.

Rationale:

- Urban heat island effect can increase the temperature in urban areas compared to the surrounding vegetated areas.
- Climate change is expected to increase temperatures and more frequent and longer heat waves.
- Mortality rates increase with increasing temperature and those at risk include the very old, the very young, those with existing health conditions, and lower socio-economic communities, which will be placed under further financial stress as air conditioning and cooling devices use increases as temperatures increase.
- Increasing urban tree cover and Green Grid connections will provide for healthier communities and more resilient, liveable cities. Not only will the temperature in urban areas decrease, other benefits include increased protection of UV rays, healthier and more active communities due to increased usable public spaces in warmer weather and and increased resilience for at higher risk sections of the community.
- Green Infrastructure is seen as an effective way to address the impacts of urban heat and supported localised micro climate cooling.
- Native wildlife and domesticated animals can also suffer in extreme heat events.

Council will:

- Increase the tree canopy coverage across the LGA by 40%. *[Individual councils to select their own percentage coverage]*
- Include deep soil zones, appropriate buildings set backs and planting provisions in the LEP.
- Implement actions within Council's Urban Tree/Forest Strategy.
- Review landscape and street tree planting strategies and guidelines.

Actions:

1. Ensure new developments include deep soil tree plantings.
2. Investigate options for green infrastructure (roofs, walls and WSUD) to be included in buildings and provisions for increasing pervious surfaces within sites.
3. Update street tree inventory and public land trees every two years to improve street tree programs and identify new opportunities. This will also ensure the protection and monitoring of newly planting trees.
4. Work with businesses, schools, other education institutions and private land owners to increase canopy tree cover on their properties.
5. Continue with free tree giveaway community days.
6. Continue to enhance green coverage through public domain planting.

Measures:

- Increase in tree canopy cover/ % increase in provision of shade trees.
- Reduction in urban heat temperature.
- Increase and strengthen existing connections of blue and green infrastructure.
- Increased the proportion of outdoor soft landscaped areas.
- Protection of existing canopy cover/ street trees.
- Climate and urban heat adapted buildings.
- % area of climate adapted streets and pedestrian areas.

- Application of water sensitive urban design (WSUD) and use of potable and non-potable sources of water for urban cooling

An efficient city: Planning Priority C19/W19/N21

Reducing carbon emissions and managing energy, water and waste efficiently

Rationale:

- Green infrastructure can assist with the mitigation of floods, improve stormwater quality, provide habitat for native animals and recreational areas for residents.
- Green infrastructure and WSUD can positively influence wind speed, humidity, air temperature, and surface temperature while at the same time improving human thermal comfort.
- Warmer urban temperatures will increase cooling demands within buildings, which will increase energy use, carbon emissions, and additional human-generated heat through air conditioning.
- Current building requirements do not specifically address the impact of increasing urban temperatures.
- While the urban layout, centres and key infrastructure have mostly been predetermined, we need to maximise any new or remaining opportunities to tackle urban heat in urban areas.
- Most cities are designed around the use of potable water as their primary water source and with changing climate and urban heat, we need to maximise water resources and increase water security to respond to increasing temperatures and heat waves.

Council will:

- Implement and integrate WSUD into all developments.
- Improve irrigation, water re-use and capture measures within open space areas.
- Advocate to improve surface reflective values (SRV) into planning controls, uplift of BASIX and NABERs targets to manage resources more efficiently, cool our cities and reduce carbon emissions.
- Investigate energy reduction option for council owned assets.

Actions:

1. Include WSUD criteria into LEPs and DCPs (rainwater tanks and grey-water harvesting, water efficient fittings, rain gardens and swales).
2. Include alternate water supply (for example, stormwater capture and sewer harvesting) to ensure adequate soil moisture levels in order to provide cooling benefits during hot months.
3. Include SRVs in DCPs to reduce reflective urban heat in the built environment.
4. Undertake energy and water audits for all councils owned assets to identify potential improvements for usage and efficiencies.
5. Include energy and water saving technologies in development proposals.

Measures:

- % of developments with WSUD implemented OR % area with WSUD infrastructure provisions. [councils need to be mindful of the on-going management and maintenance responsibilities and costs associated with any proposed targets].
- % of reflective surfaces implemented [councils need to recognised the complexities in managing proposed targets].
- % reduction in energy and water usage and cost for council owned assets.

A resilient city: Planning Priority C20/W20/N22

Adapting to the impacts of urban and natural hazards and climate change

Rationale:

- Urban cooling outcomes that increase tree canopy coverage, increase shade, consider appropriate material and surface treatments to mitigate against urban heat, and integration of water capture and

reuse of water within the local environment, contribute to the built form cooling and liveability of the community. This is supported by well-planned and designed urban spaces and built forms that are responsive to reducing the excess heat stored within urban environments.

- Increasing temperatures due to climate change and greater urban densities, will lead to increasing urban heat. Adaptation to increasing urban heat means building communities that are adapted and resilient to hot temperatures: buildings and precincts that utilise sustainable design principles; use less energy, water and waste; and utilising cool materials, greenery and water to help reduce local temperatures.
- Heatwaves already have significant impacts on our people and city, including increasing energy use and peak demand, grid reliability and power failures, and increasing morbidity and mortality rates. These impacts will be exacerbated with climate change and increasing temperatures.
- Additional points should be considered if Option 2 is pursued, including health, thermal comfort and peak energy demand.

Council will:

- Review Council-owned bus shelters across the Local Government Area for climate adaptiveness and opportunities.
- Investigate water capture and reuse within appropriate Council open space areas.
- Develop and deliver community engagement programs to increase understanding and involvement in measurement of the urban heat island effect.
- Consider heat in the design and development of Council parks, open space, and facilities and for long term asset management considerations.
- Reduce impervious surfaces where practically feasible, replace with pervious surfaces (for example in low trafficked areas and through building set backs).
- Implement verge plantings in priority heat areas to provide shade, water retention opportunities, and cooling.
- Build community resilience and capacity to respond to heat waves through engagement and education.
- Work and collaborate with other agencies to build and strengthen partnerships to work towards achieving a 2c cooling goal (100 Resilient Sydney), lobby for BASIX and NABERS standard improvements and SEPP creation through partnerships, and in the delivery of urban heat mitigation measures.
- Develop and implement strategies to retrofit existing buildings to improve thermal performance eg: insulation, glazing, drought proofing and renovations to apply passive design.

Actions:

1. Implement Green Building standards with Design Excellence standards for whole of Local Government Area through LEP and DCP.
2. Undertake a bus shelter audit and devise programs for retrofitting and adaptation.
3. Identify Council buildings that could be retrofitted, e.g. through light coloured paints or heat reflective roofs, and identify costs of program implementation.
4. Work with Department of Housing to include sustainable design excellence that prioritises considerations for passive ventilation, directional limitations to minimise reliance on appliance usage through north facing (where practically feasible), adequate set backs for deep soil provision, and planting for green infrastructure and heat considerations in all of their areas of social and affordable housing.
5. Investigate and implement cool pavement and pervious surface opportunities throughout the city.
6. Increase shading, particularly of hard surfaced areas in hot months.
7. Advocate for increased adoption of renewable energy sources to reduce further escalation of urban heat and other climate change impacts.

Measures:

- Number of climate adapted people shelters installed.
- % increase of buildings with with urban heat mitigation appropriate reflectivity and shading.
- % of new release area/precinct areas that incorporate urban heat reduction and Design Excellence provisions.
- Number of precincts retrofitted to achieve 'cool precinct' design standards.

Attachment 2:

LEP review - Potential wording for a stand-alone LEP clause

Potential new stand-alone clause – Without mapping

7.X Urban Heat

- 1) The objective of this clause is to ensure new development incorporates effective design and ongoing operation to reduce and remove urban heating from the environment and protects community health and wellbeing.
- 2) This clause applies to all Commercial Premises; Industry and Residential Accommodation developments.
- 3) Development consent must not be granted to any development unless the consent authority is satisfied that:
 - a. the building roof, paved surfaces and podium have been designed to reflect and re-radiate absorbed solar heat away from urban areas and to maximise user comfort of roofing, paved surfaces and podium areas; and
 - b. the building facades minimise solar heat being reflected downward towards private open space and or the public domain; and
 - c. the awnings and eaves are designed to provide shelter from the sun and improve user comfort at street level; and
 - d. the buildings' heating and cooling systems minimise heat rejection to private open space and the public domain; and
 - e. the buildings maximise the use of green infrastructure; and
 - f. the development is capable of accommodating adequate open space and deep soil zones to achieve urban cooling benefits; and
 - g. the buildings are designed to improve thermal performance eg: insulation, glazing, drought proofing and renovations to apply passive design principles to reduce the need for heating or cooling.

- 4) In this clause:

Solar heat means radiant heat contained in the full spectrum of sunlight.

Urban heat refers to higher ambient temperatures (over 28°C) that pose a risk to our communities and infrastructure.

Urban heat island effect is the tendency of cities to be much warmer than their rural counterparts.

Green infrastructure is essential infrastructure that includes the network of designed and natural vegetation found in urban areas including parks, vegetation and urban green technology such as green roofs, deep soil zones, landscaped and open space areas. This may include things such as porous pavements, bioswales, rain gardens, wetlands, biofiltration devices and park areas.

Notes:

- In Clause 2, commercial premises, industry and residential accommodation development cover all the major development types. There is the potential to additional developments types, such as Educational Establishments etc if required.
- The LEP clause provisions above need to be supported with appropriate urban heat provisions with Council's DCP.

Potential new stand-alone clause – With mapping

7.X Urban Heat

- 1) The objective of this clause is to ensure new developments incorporate effective design to reduce and remove urban heating from the environment and protect community health and wellbeing.
- 2) This clause applies to all Commercial Premises; Industry and Residential Accommodation developments within the “high heat” areas [*terminology needs to be consistent with final OEH Urban Heat mapping*] of the **Urban Heat Mapping**.
- 3) Development consent must not be granted to any development unless the consent authority is satisfied that:
 - a. the building roof, paved surfaces and podium have been designed to reflect and radiate heat away from urban areas and to maximise user comfort of roofing, paved surfaces and podium areas; and
 - b. the building facades minimise solar heat being reflected downward towards private open space and or the public domain; and
 - c. the awnings and eaves are designed to improve user comfort, provide shelter from the sun and reduce solar heat at street level; and
 - d. the buildings’ heating and cooling systems minimise heat rejection to private open space and the public domain; and
 - e. the buildings maximise the use of green infrastructure; and
 - f. the development is capable of accommodating adequate open space and deep soil zones to achieve urban cooling benefits; and
 - g. the buildings are designed to improve thermal performance eg: insulation, glazing, drought proofing and renovations to apply passive design principles to reduce the need for heating or cooling.

- 5) In this clause:

Urban heating means heat impacts associated with development including solar reflectance and transmittance.

Urban heat refers to higher ambient temperatures (over 28°C) that pose a risk to our communities and infrastructure.

Urban heat island effect is the tendency of cities to be much warmer than their rural counterparts

Green infrastructure is essential infrastructure that includes the network of designed and natural vegetation found in urban areas including parks, vegetation and urban green technology such as green roofs, deep soil zones, landscaped and open space areas. This may include things such as porous pavements, bioswales, rain gardens, wetlands, biofiltration devices and park areas.