

Submission  
No 126

**INQUIRY INTO PLANNING SYSTEM AND THE IMPACTS  
OF CLIMATE CHANGE ON THE ENVIRONMENT AND  
COMMUNITIES**

**Organisation:** AILA - Australian Institute of Landscape Architects  
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## **AUSTRALIAN INSTITUTE OF LANDSCAPE ARCHITECTS (AILA) SUBMISSION**

### **NSW legislative Council No7 - PLANNING SYSTEM AND THE IMPACTS OF CLIMATE CHANGE ON THE ENVIRONMENT AND COMMUNITIES.**

Thank you for the opportunity to provide comments on the inquiry into the planning system and the impacts of climate change on the environment and communities.

We applaud the NSW Government for considering the long-term future impacts of climate on the liveability of the built environment, and the protection of our natural environment.

We congratulate the NSW Government for their leadership in adopting the current National Construction Code (NCC), and for incorporating embodied carbon assessment into the Building Sustainability Index (BASIX). We commend and support the National Australian Built Environment Rating System (NABERS) for taking the role in a nationally consistent approach to embodied carbon.

We are very heartened by the recent decision to not build up to 10,400 houses in the Hawkesbury Nepean Flood Plain<sup>1</sup>. This is a very positive and responsible move.

#### **INTRODUCTION**

The Australian Institute of landscape architects recognises the impacts of climate change as one of the most important issues facing the built environment. Many of these climate impacts are interconnected, and there are multiple pathways to provide both mitigation and adaptation.

#### **ABOUT AILA**

The Australian Institute of Landscape Architects (AILA) is the peak national body for the Landscape Architecture. AILA champions quality design for public open spaces, stronger communities, and greater environmental stewardship. We provide our members with training, recognition, and a community of practice, to share knowledge, ideas and action. With our members, we anticipate and develop a leading position on issues of concern in landscape architecture. Alongside government and allied professions, we work to improve the design and planning of the natural and built environment.



In operation since 1966, AILA represents over 3,500 landscape architects and promotes excellence in planning, design and management for life outdoors. Committed to designing and creating better spaces in Australia, landscape architects have the skills and expertise to improve the nation's liveability through a unique approach to planning issues via innovative integrated solutions. In doing so, landscape architects contribute towards better environmental, social and economic outcomes for all Australians.

### **The Inquiry makes no mention of urban heat**

While the study mentions flood, bushfire, sea level rise and biodiversity loss, one of the biggest single impacts on nature and the built environment is increasing urban heat. Heatwaves kill more Australians than all other disasters. Managing the relentless rise in urban heat and extreme events is a critical part of the picture.

### **We still build suburbs and communities with outdated thinking**

In the middle of a housing affordability crisis, we still seem to be building houses and suburbs that will be unliveable with increasing urban heat and be potentially unsellable in decades to come. We keep building them in flood prone areas. The great Australian dream of owning a house is getting further out of reach. Worse still, our current suburban model may jeopardise the biggest single investment most people ever make. Will you be able to sell if your house is uninhabitable and uninsurable in 2050?

It is critical to emphasise that the housing affordability crisis is being used as a pretext by developers and their lobby groups to push back on much needed reforms, even those as simple as requiring light coloured roofs.

## **RESPONSES – QUESTION A**

**How the planning system can best ensure that people and the natural and built environment are protected from climate change impacts and changing landscapes of developments proposed or approved?**

There are multiple threads raised in this question, and we have addressed them separately:

### **(I) Flood prone lands.**

#### **Background**

The recent floods in Lismore and Sydney have had devastating impacts on those communities. It is inevitable that there will be a larger flood at some stage. Therefore, we cannot afford to invest billions of dollars of new housing and infrastructure in flood prone areas. If we take a longer term perspective of development, just like critical infrastructure such as hospitals, there should be no new housing placed below the Probable Maximum Flood or PMF line. We



welcome the Governments recent decision to halt the construction of approximately 10,400 homes in flood prone lands in Western Sydney.

### Artificial flood boundary based on out of date data

At present, we have an artificial demarcation line based on historical data for the 1% AEP (annual exceedance probability) of a line that defines flood prone land from supposedly safe to build on land. The 1% AEP (old 1:100) is outdated and based on historical data from a less volatile climate. This needs to be reviewed as we need to be forward thinking as climate change is rapidly shifting the benchmarks. Climate Scientist Katherine Hayhoe says that we are consistently failing to account for the extra 10 zetajoules of heat per year we are driving into the earth's oceans that is driving more intense storms and rainfall. <sup>ii</sup>

The recent Hurricane Otis, that progressed from a tropical low to a category 5 Hurricane in 24hrs is an example of this. Similarly, the new \$137Million Windsor Bridge which was designed to be above the 1% AEP mark flooded in march 2021, not long after its opening.

### Historic precedents

The floodwaters in the 1867 floods in Sydney's Hawkesbury Nepean basin were up to 5 m higher than the one percent AEP Level at Windsor bridge. This is an entire two-story building difference. The reality is, it's not a question of if, but when another large event like this will occur. If we take a longer look at development beyond the short term housing affordability crisis, suburbs that we plan now will be there for a considerable time into the future. Insurance claims from an 1867 level event if it were to occur today, is estimated to be around \$8 Billion.

### Recommendations:

- We applaud the Governments recent decision to prohibit new development in flood prone land in the Hawkesbury Nepean River flood plain.
- Undertake similar flood and evacuation reviews for Cosgrove Creek, Badgeries Creek, South Creek, Ropes Creek, and Kemps Creek upstream of Marsden Park. These creeks flow through the new Bradfield / Aerotropolis development and future suburbs of Rossmore, Austral, and Leppington, among others that are yet to be planned.
- Preferred outcome: No development within the PMF impacted lands and use that land for food production, flood mitigation and recreation.
- Alternative outcome: No development below the 1:500 event. Develop new architectural and design strategies for any buildings above the 1:500 event and the PMF. For example depending upon projected water depth, two storey construction with resilient ground floors and habitable floors above the PMF.



- In older residential areas flood prone, particularly those facing unaffordable insurance premiums, consider, with appropriate consultation and education a buy back option that pays fair market price, to acquire flood prone properties.
- Plan with consultation, options for a managed retreat approach for existing dwellings in high risk, flood prone areas.
- Stand by the NSW Government decision to not raise the Warragamba dam wall.
- Do not lower the Warragamba dam water level as it is needed for water security. See commentary in comments on b, c and e.
- Adopt a sponge cities approach, using blue green infrastructure and natural systems to provide room for the river. Work with The Australian Institute of landscape Architects and other experts to develop this.
- Make green infrastructure as an asset class so it can be accounted for in budgets.

#### (I) Fire prone land.

Australia has had repeated catastrophic fires over the last century, including the 1983 Black Friday fires and the recent 2019 and 2020 bushfires. Part of this can be attributed to the displacement of Aboriginal people off their land and the loss of traditional owner cultural burning practices. Studies and anecdotal evidence show that current hazard reduction burns conducted by the current Rural Fire Service, may actually be increasing hazards, by encouraging the regrowth of hot fire species. See this ABC story on the [Tarthra cultural burning programme](#).

We have also had excessive responses to managing fire through destructive clear zone requirements, and onerous APZ's that have a high impact on habitat, biodiversity and visual amenity. Unfortunately, these measures proved largely ineffective during the intense 2019 and 2020 fires.

Over the past 235 years, farming practices imported from Europe including set stocking, have led to soils loss and degradation, reduced water holding capacity and decline in soil carbon levels. Regenerative farming approaches that prioritise soil health and increased biodiversity over stock or crops such as those championed by [Charles Massey](#), and [natural sequence farming by Peter Andrews](#), offer potential solutions. These land management systems store substantially more carbon and water than traditional farming, providing drought resilience in across the entire landscape.

Regenerative farming systems aim to minimise bare ground, maximise photosynthetic cover, and manage the water cycle by slowing water down to hydrate the soil. They also promote the development of a healthy Soil biota including from earthworms and nematodes down to fungus; and avoid the use of pesticides and industrial fertilisers that harm soil biota.



We strongly advocate for a more holistic approach to fire management, which includes improving farming practices to enhance soil moisture retention. Additionally, we support the reintroduction of Cultural burning by Traditional Owners, with a specific focus on high-value areas.

### Recommendations:

- In line with the NSW Governments policy of "Starting with Country" engage with Aboriginal and Torres Strait Islander knowledge keepers to develop strategies to re-introduce indigenous cultural burning practices to protect properties and valuable natural sites.
- Develop policies and strategies to educate land owners, government agencies to help remove the various barriers to cultural burning.
- Build knowledge and drive employment by the significantly greater use of cultural burning and traditional land management.
- Have the Rural Fire Service engage and learn from indigenous Traditional Owners and knowledge holders on cultural burning to inform and revise hazard reduction burn procedures and techniques.
- Provide planning incentives, education and support for farmers to transition to regenerative farming approaches to look after soil, store more carbon in soil and in turn create greater water holding capacity to keep the larger pastoral landscape hydrated longer, and greater ground water, and stream flows.
- Remove onerous land clearing APZ requirements currently in place of more design and management based solutions

### (ii) Sea level rise, and coastal erosion.

Sea level rise is the gradual, long term consequence of climate change. While the predicted rise by 2100, is in the order of 900mm, The IPCC cryosphere report forecasts potential sea level rise of between three and five metres by 2300. This significant rise will impact coastal areas of NSW including densely populated centres. Sea level rise has many potential impacts on urban and rural landscapes including:

- Salt water incursion through the water table, leading to the death of plants, crops, and other vegetation in the vicinity of the coastal edge.
- Existing Stormwater drainage pipe networks being flooded and not functioning.
- Exacerbating storm surge and costal erosion as we have seen at Clontarf beach.



Although sea level rise is expected to be slower than other climate impacts such as heat, long-term predictions indicate a relentless upward trend. During the recent Holocene period, following the end of the last ice age, sea levels rose about 75m until atmospheric temperatures stabilised. However, sea levels continued to rise another 45m due to residual heat stored in the ocean.

It's important that the solutions don't make it worse elsewhere. In the face of sea level rise, temporary measures such as levies and bunds/ dykes while solving immediate problems, often create other problems of their own. Particularly in rainfall events where they dam the water upstream of the water body, they are protecting dwellings from. They block visual and physical access to the river or ocean, and require pumping, pen stock valves and other devices. This is the case of flood prone town on the lower Clarence River Valley such as Maclean.

### Recommendations:

- That all developments on the coastal edge demonstrate long-term planning strategies to Consider and accommodate sea level rise.
- No new coastal edge land releases until a review of likely sea level rise impacts are considered.
- Prohibit any developments that remove or build in the intertidal zone including mangrove ecosystems.
- Consider options for buy back strategies. A complex issue as there are high value land holdings (e.g. Clontarf Beach) as well as lower value land owners (e.g. Hawkesbury Nepean River flood plain, and Lismore) that have been impacted by poor planning decisions, made in some cases a century ago.
- Retain and protect coastal ecosystems including mangroves, saltmarshes, seagrass meadows, reeds, wetlands and associated muds and silts, can store significant amounts of carbon.
- Restore blue carbon ecosystems where they exist on new and existing sites.

### **(iii) Areas that have threatened, ecological, communities, or habitat for threatened species.**

Addressing this issue is particularly challenging in urban areas. In Sydney, we have witnessed the substantial loss of Cumberland Plain woodland, and what remains is often small, fragmented and isolated. There are dwindling places where you can still encounter Kangaroos, emus and echidnas in these ever shrinking pockets of vegetation.



Moreover, there are plant communities that provide critical habitat for threatened species, such as Koalas, Grey headed flying foxes and Greater gliders. Part of the problem can be traced back to the fact that under the EPBC Act we only really protect species when it's virtually too late. Even with that there are very few plans being implemented to safeguard threatened species. The iconic koala is predicted to be functionally extinct in New South Wales by 2050. Cumulative impacts include loss of habitat, fragmentation of remaining habitat, subsequent encroachment of urban impacts and diseases like chlamydia. For instance, Sydney's largest chlamydia free population of around 1400 Koalas on the Georges River recorded 30 fatalities from road kill this year alone.

### Recommendations:

- Push the Federal Government to update the EPBC Act, in line with the Samuels Report.
- Develop legislation to minimise further tree and vegetation removal and protect remnant vegetation in existing suburbs and new urban development.
- Develop policies and planning to connect remnant fragmented vegetation
- Reconsider offsets as these are deeply flawed and effectively leading to overall net loss of ecosystems and biodiversity.

**Combined response to (e) other matters, (b) the adequacy of planning powers and planning bodies, and (c) short, medium and long term planning reforms that may be necessary to ensure that communities are able to mitigate and adapt to conditions caused by changing environmental and climatic conditions, as well as the community's expectation and need for homes, schools, hospitals and infrastructure**

These are very wide ranging questions, but the fact of the matter is that we continue to build and deliver new suburbs in western Sydney that are going to be unliveable in the coming decades, particularly around the issue of urban heat.

### Poor urban design and limited housing choices – a problem 20 years in the making.

#### Increasing urban heat and poor suburb and house design

On the 4th of January 2020, the western Sydney suburb of Penrith was the hottest place on earth. It experienced record-breaking temperatures, reaching a scorching 48.9 degrees Celsius. The sobering reality is that our cities are increasingly facing the prospect of 50-degree days. To prepare for the future, we must prioritise the delivery of cool, green, and resilient urban environments that are fit for the future.





There are fundamental issues with street layout, suburb design and lot planning negatively impacting passive design options and pedestrian connectivity. East-west streets, for instance, expose the longest face of most buildings to the highest morning and afternoon heat loads.

Historic issues relating to Indicative layout plans: Many new suburbs have been designed around indicative layout designs, done up to a decade ago, with little or real world verification. The result is a lack of thoughtful planning, leading to poor open space outcomes and often sub optimal street orientation. Unfortunately, Councils are reluctant to revise these plans, treating them as de-facto DA arrangement that stifles innovation and better design.

Building size is another significant issue: Australians tend to build some of the largest houses in the world. We have entrance halls as big as lounge rooms, walk in wardrobes the size of bedrooms, as well as games rooms and home cinemas. This size driven approach comes at a cost. While a decade of low interest rates has kept pushing up prices, we also purchase, heat, cool and clean our houses by the square metre. Even a modest reduction in size would yield positive outcomes.

One of the single biggest problems in the southern states is dark grey concrete tiled roofs driving heat issues. There is a distinct lack of choice. Display home villages don't have any white roofs. There are only a small number of builders that are simply replicating what they have done before, or sells the best. The upshot has been that even basic improvements to house design – e.g. light roofs, we get Pushback of better regulatory control by vested interests including developers and Development lobby groups.

Poor building design is delivering houses that resemble glorified tents with a star rating averaging 1.8. Most Australians live in off the shelf project homes not architecturally design houses, let alone passive houses. This is impacting the cost of living with higher energy bills for heating and cooling poorly designed and constructed houses.

Embodied and operational emissions: The built environment is a major contributor to greenhouse gas emissions, including both embodied and operational emissions. Urban areas alone contribute up to 40% of the world's greenhouse gas emissions. New developments have significant "day one" embodied emissions that directly contribute to climate change. Additionally, poor insulation and low star rated buildings are contributing to further unnecessary operational emissions. With the population of cities like Melbourne and Sydney set to double by 2036 this is of paramount importance. The transition away from fossil gas is imperative, and it should be swiftly banned, with a shift to all-electric suburbs. This is not about consumer choice, this is critical consideration about public health and climate mitigation.

We need to be delivering a cool green urban environment that helps to mitigate climate impacts for residents. The current Bradfield / Aerotropolis plans are driving for these outcomes, but they are in part being impacted excessively onerous aviation safety guidelines. These are excessive, to the point of prohibiting trees closer than 200m apart. Every single



airport in Australia has substantial tree canopy within a 3km radius of the airport and the current excessive guidelines are delivering a tree less desert around the new airport.

We would like to see ongoing commitment to the Premiers priorities including #12 which aims to increase canopy cover.

We would also ask the NSW Government to re-introduce the Design and Place SEPP. It is an extremely good document that was the result of 3years of consultation and expert advice, including our Institute of landscape Architects. It was repealed following the change in Premiers, and Minister for planning the former government, following intensive lobbying from the development industry. This was very short sighted thinking and we very much need the Design and Place SEPP reinstated to help deliver cool, green, liveable cities, fit for the future.

### Recommendations:

- Reinststate the design and place SEPP.
- Undertake a serious rethink of all existing Indicative layout plans for Sydney Suburbs. These all need to be properly ground trothed and a greater emphasis put on liveability, access to open space, public transport and not simply housing targets. If targets are an issue, then there needs to be greater density, particularly facing green infrastructure. See the strategies being developed at Bradfield / Aerotropolis.
- Allow more tree canopy to be provided in the 3km radius around the new Western Sydney airport but allowing greater latitude in interpretation of the aviation safety restrictions.
- Ensure urban design and street design/ lot layouts maximise the opportunity for passive solar controls by delivering a minimum of 80% of the suburb with north oriented lots ( ie North/South oriented streets)
- New density developments along rail lines need to fund the purchase of new land for public open space. We simply don't have enough. All current plans only have high density housing and virtually no new open space.
- Require all new buildings, including residential and commercial to be minimum 8 star rated.
- Work with housing construction companies to require a minimum of basic passive controls such as eaves and double glazing on residential project homes.
- Require smaller building footprints in relation to lot size, by mandating a minimum of 40% dedicated to green space on lots. Require at least 25% of the open space to be one consolidated useful open space connected to the primary living areas. Has added benefits of cheaper house construction.



- Incentivise or mandate light coloured roofs with both high reflectivity and low heat gain. Work with housing companies to help drive this change and overcome perceived barriers of higher costs.
- Ensure parklands in new suburbs are not just the spaces left over in the flood plains, but actually useful connected, cool green spaces. Include ridge top parks for views and cooling breezes.
- Mandate no new fossil gas connection in all new developments.
- Encourage 2 way charging and vehicle to grid charging.
- Update Basix to meet likely future scenarios for urban heat. (see WSROC submission)
- Embed urban heat island mitigation into planning.
- Require that new homes can maintain survivable temperature in heatwave conditions for occupants so they can effectively shelter in place. This might include ensuring that there is at least one highly insulated refuge room, with reverse cycle air conditioning, connected to solar panels.
- Investigate how the above measures can be implemented for vulnerable residents in Western Sydney.
- Identify vulnerable and disadvantaged residents in Sydney and Develop retrofit packages and funding assistance for older house stock in Sydney.
- Promote Green infrastructure an infrastructure asset class with Infrastructure Australia.
- Work with, the PIA, AIA, AILA, GBCA, and other agencies like resilient Sydney, WSROC, sweltering cities towards strong action on climate.

### **Change Business as usual drainage design to one of water sensitive sponge cities.**

Introduction. We still design streets with highly engineered piped drainage systems to move water away as fast as possible. In a matter of minutes, All the rain that falls on our suburbs finds its way to the end of pipe. Consequently, we resort to further engineered solutions to limit flooding, such as detention basins, which in turn take up valuable public open space.

The result of this approach is that we have expensive houses with high impervious coverage on sites. When we consider, roads, footpaths and driveways there might be as little as 5-15% soft green space left on a housing lot. In managing water we have the paradox of urban development generating huge amounts of runoff water that causes stream erosion and flooding.

To address this issue, we should leverage the natural environment as a defence mechanism for flooding and establish a robust blue-green grid.



Water security. When the last drought broke in March 2020, Sydney only had about 700 days of water left before day zero. [Sydney Water Reference]. Had the drought persisted, Sydney's entire water supply would have been expended in about 4.7 years. When our population doubles, as it is expected in 2036, this buffer might shrink to 2-3 years supply. This is far too precarious for our future city likely to be 8 million people by then. The critical issues is that we need to protect Warragamba dam's water supply by any means possible. This means gigalitre recycling and stormwater harvesting. We need a zero ocean outfall policy.

Warragamba dam. We welcome the NSW government's decision not to raise the dam wall. The recent proposals to raise the height of Warragamba dam would have been creating a false sense of security. Not only that, the 1500GL addition capacity would have been filled in about three days during the 2021 floods as inflows were around 500GL per day. In the process we would have lost irreplaceable indigenous art, critical habitat and people still would have been flooded. A dreadful lose – lose outcome. In line with our point above on water security, we also strongly recommend that Warragamba dam water level not be lowered to create flood capacity.

## Recommendations:

### Short term

- Start to use the 1:500 event as the boundary line on the Hawkesbury Nepean River System.
- Run the desalination plant 100% of the time to help protect Warragamba Dam supplies.
- Investigate if there are options to re-negotiate the \$500,000 per day contract for the Canadian owners of the Desalination Plant
- Set up planning framework to encourage Gigalitre scale stormwater capture and re-use programmes.
- Implement a "No Ocean Outfall" policy to drive high levels of recycling / circular system of sewerage for re-use for domestic purposes.
- Undertake a serious rethink of all existing Indicative layout plans for Sydney Suburbs. These all need to be properly ground trothed and a greater emphasis put on liveability, access to open space, public transport and not simply housing targets. If targets are an issue, then there needs to be greater density, particularly facing green infrastructure. See the strategies at Bradfield / Aerotropolis.

### Long term

- Amalgamate water agencies that manage water supply, sewer, stormwater, into one body like Melbourne Water.



- In light of the push for embodied carbon reporting, we ask the NSW Government to help fund the uptake of Environmental product disclosures (EPD's) by industry, particularly smaller business where the several thousand dollar outlay per product can be quite onerous.
- In light of the current climate and biodiversity emergency, we call on the NSW Government to help accelerate the adoption of the NCC and ask for yearly updates rather than every three years. This will help accelerate the time critical impact we need this decade to make a difference to our future

Much of the short term actions around built environment climate action can be found in our [Climate positive design action plan for Australian landscape architects](#). Refer in particular to chapter 7.0 which is our climate mitigation and adaptation toolkit.

## SUMMARY

We thank the NSW Government for this opportunity to comment and we again applaud the direction that is being taken with codes. We also thank the government for their forward thinking ban on development in Sydney's Hawkesbury Nepean basin which will protect NSW residents from future flood, and consequent economic impacts.

All new development should be naturally comfortable and healthy, 100% renewable electric (no fossil fuels), low embodied carbon and occur in places that are safe from flood and fire. These basic rights should not be compromised in the name of cost or supply, as they are essential for their equitable provision. Instead, the planning system should be structured to support sufficiency and appropriate co-usage of facilities as drivers of decisions on where, what and how to build cost-effective, well designed buildings

The NSW Government should continue to develop and enhance our green-blue infrastructure and strive to create cool, green liveable cities and towns.

Feel free to contact myself if you have any questions for require further information on aspects of our submission.

Sincerely yours,

AILA NSW President

Submission Author.



## REFERENCES

End notes:

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<sup>i</sup> NSW rejects housing projects on Western Sydney floodplains. [internet] accessed 29/10/2023 available from <https://www.insurancenews.com.au/regulatory-government/nsw-rejects-housing-projects-on-western-sydney-floodplains#>

<sup>ii</sup> Katherine Hayhoe on ocean heat content and its impacts on intense rainfall events. [internet] accessed 29/10/2023 available on X (formerly Twitter) <https://www.abc.net.au/news/2023-10-03/minister-asked-to-intervene-to-stop-koala-deaths/102923724>