



To whom it may concern

Urban Open Spaces Land Management Plan

The Commissioner for Sustainability and the Environment is an independent statutory position established by the *Commissioner for Sustainability and the Environment Act 1993*. My Office embraces transformative change for an environmentally sustainable future and encourages sound environmental practices and procedures to be adopted by the Territory.

The Office broadly supports the new Draft Urban Open Spaces Land Management Plan (the Plan) and finds that document to be clear and accessible. In particular, we appreciate its comprehensive recognition of other relevant policies and legislation, and its clear articulation of value hierarchies as they apply to different categories of urban open space.

For your consideration, we also raise the following points:

Risk of weed spread through contaminated mowing equipment

TCCS is responsible for mowing a range of public land types, including native grasslands. Using mowing equipment across these different land types increases the risk of weed spread into sensitive areas. As such, it is important that equipment is thoroughly cleaned when moving from general amenity areas to native grasslands and other areas of conservation value.

It may be the case that equipment cleaning protocols are set out in a separate policy, but it would be beneficial to highlight them in the present Plan as well.

Recommendation 1: Stipulate that mowing equipment must be thoroughly cleaned when moving between land types into sensitive areas such as native grasslands.

Adverse environmental impacts of artificial turf

The Plan indicates the ACT Government will investigate water savings measures for urban public spaces such as the installation of artificial turf. While the conversion of natural grass turf to artificial turf may provide benefits from a water savings standpoint, the range of adverse environmental impacts stemming from artificial turf renders these benefits negligible. Such impacts include high surface temperatures contributing to the urban heat island effect, microplastics pollution, increasing landfill at end of life, production of greenhouse gasses during manufacturing and loss of biodiversity.

High Surface Temperatures

The surface temperature of artificial turf can be significantly higher than that of natural turf under the same ambient temperature and direct sunlight on hot days. The NSW Chief Scientist & Engineer recently published a report on the use of synthetic turf in public spaces across NSW. The report found that on hot summer days with air temperatures reaching the mid-30s or higher, synthetic turf surface temperatures can rise up to 38°C higher than natural turf, with maximum surface temperatures ranging from the 70s to above 90°C.¹

¹ NSW Chief Scientist & Engineer (2022). *Independent review into the design, use and impacts of synthetic turf in public open spaces*. Found at: <https://www.chiefscientist.nsw.gov.au/independent-reports/synthetic-turf-in-public-spaces>

These elevated temperatures may cause thermal discomfort for users of the oval and create risks of heat injury during hot conditions. Western Sydney University urban heat researcher Dr Sebastian Pfautsch has conducted research on the surface temperatures of playground surfaces using AstroTurf and soft-fall rubber across Western Sydney. The research found that these surfaces can reach up to 90°C on a summer's day, with reports of toddlers receiving second-degree burns on their feet.²

The high surface temperatures of artificial ovals compared to natural grass ovals has been observed within the ACT context. The 2017 CSIRO report commissioned by ACT Government – Mapping Surface Heat in Canberra³ – found that artificial ovals recorded above-average surface temperatures on summer mornings comparable to areas that have been cleared for development such as industrial areas, carparks, and new housing developments. Conversely, the report found that areas with below-average surface temperatures on summer mornings included irrigated playing fields. A surface temperature comparison of Willows Oval (a synthetic oval located at the ANU) and North Oval (an irrigated natural grass oval located across Barry Drive) found that Willows Oval was 8-9°C hotter.

Artificial turf's high surface temperatures, which can surpass common impervious surfaces such as asphalt and concrete, compounded by the removal of grass or vegetation to be replaced with artificial turf may exacerbate the urban heat island effect (UHIE). The NSW Chief Scientist & Engineer report found that the *"Contribution of synthetic turf to the UHIE is likely to be small, contained within the spatial footprint of the surface, but the cumulative depletion of grass surfaces over time may exacerbate heat exposure risk in the population, particularly vulnerable populations"*.⁴

The UHIE is a phenomenon where temperatures in urban areas are warmer than surrounding areas, which is attributed to the reduction of natural landscapes and green spaces and prevalence of heat-retaining impervious surfaces. The UHIE increases the heat-related impacts of climate change, making increased temperatures and extreme hot weather events more severe. Mitigating the UHIE in the ACT is a key objective of the *Climate Change Strategy 2019-2025, Living Infrastructure Plan: Cooling the City* and *Urban Forest Strategy 2020-2045*, which aims to increase tree canopy coverage and surface permeability.

With projections of a much hotter future in the ACT, climate change considerations should underpin decision-making around urban planning and design. Instead, replacing natural turf, which transpires when wet and has a cooling effect, with artificial turf represents a maladaptive response to the impacts of climate change.

Microplastics Pollution

Artificial turf is comprised of synthetic turf blades and granulated rubber infill, which slowly degrades into microplastics. These microplastics can end up in waterways, especially during heavy periods of rainfall, where they pollute the environment and threatened aquatic life. In addition, rubber granules may contain potentially harmful chemicals such as polycyclic aromatic hydrocarbons, metals, and phthalates.⁵ In Europe, the European Chemicals Agency has estimated that artificial sports ovals release up to 16,000 tonnes of microplastics into the environment each year. In NSW, the Australian Microplastic Assessment Project with Northern Beaches Council, funded

² Emma Mulholland (2021). *Can't stand the heat? Plant a tree*. Western Sydney University Publication. Found at: <https://www.westernsydney.edu.au/alumni/gradlife/publications/cant-stand-the-heat-plant-a-tree>

³ CSIRO (2017). *Mapping surface urban heat in Canberra*. Prepared for: ACT Government

⁴ NSW Chief Scientist & Engineer (2022). *Independent review into the design, use and impacts of synthetic turf in public open spaces*. Found at: <https://www.chiefscientist.nsw.gov.au/independent-reports/synthetic-turf-in-public-spaces>

⁵ European Chemicals Agency. *Granules and mulches on sports pitches and playgrounds*. European Union. Found at: <https://echa.europa.eu/hot-topics/granules-mulches-on-pitches-playgrounds>

by NSW's Environment Protection Authority, found that near synthetic fields 80% of the waste entering stormwater drains was rubber infill and microplastics from synthetic turf blades.

This degradation of artificial turf into microplastics is particularly concerning in the context of climate change, where intense ultraviolet conditions may accelerate the degradation of turf fibres. This finding has led the NSW Chief Scientist & Engineer to conclude "*overall, it is not clear whether expectations about the longevity and carrying capacity of synthetic fields can be met under Australian climatic conditions, potentially influencing decisions about installation and cost-benefit considerations*".⁶

In addition to microplastics and high surface temperatures, the environmental impacts of the artificial turf are as follows:

1. Increases landfill at end of life: synthetic turf is comprised of synthetic fibres typically made from nylon or polypropylene. Once it has reached its end of useful life, it can be difficult to recycle due to contamination, colours, and stabilisers within the material. This should be an important consideration in light of the ACT's zero waste aspirations.
2. Produces greenhouse gas emissions during manufacturing: synthetic turf requires higher energy consumption and generates more greenhouse gases associated with the use of plastic materials. In contrast, the production of natural turf has lower greenhouse gas and energy requirements to be produced and natural turf may also act as a carbon sink.
3. Impacts on local biodiversity: replacing natural turf with synthetic turf may lead to habitat loss and disruption of wildlife corridors. For example, recent research from Spain has highlighted that the trend of replacing natural turf with synthetic turf in public spaces may be a significant new threat to bird conservation.⁷

Recommendation 2: Remove mention of artificial turf as a water saving measure for investigation in the final Plan.

Inclusion of up-to-date data on protected and threatened species in the ACT

Finally, the Plan references my Office's 2019 ACT State of the Environment Report (SoE) as its source of information on the number of protected and threatened species in the ACT. Given listings are subject to change and the SoE is only updated every four years, it is recommended that up-to-date data is sought from EPSDD for this Plan.

Recommendation 3: Replace protected and threatened species information attained from the 2019 ACT State of the Environment Report with updated data from EPSDD.

Thank you for your consideration and please do not hesitate to contact me if you have any queries.

Yours sincerely



Dr Sophie Lewis
Commissioner for Sustainability
and the Environment

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⁶ NSW Chief Scientist & Engineer (2022). *Independent review into the design, use and impacts of synthetic turf in public open spaces*. Found at: <https://www.chiefscientist.nsw.gov.au/independent-reports/synthetic-turf-in-public-spaces>

⁷ Sanchez-Sotomayor et al. (2022). 'Artificial grass in parks as a potential new threat for urban bird communities'. *Bird Conservation International*, pp. 1 - 8