



Climate Action Merribek
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Submission on Merri-bek's Open Space strategy

Dear Merri-bek Council,

We much appreciate this opportunity to put in a submission for the drafting of a new Open Space Strategy. This is a key piece of Council policy for ensuring liveability, sustainability, resilience and climate adaptation as global warming continues with increasing temperatures and extreme weather events.

Our discussion covers the following

- Potential expansion of definition
- Drivers of Change
- Waterways of Merri-bek
- Open Space Strategy 2012 Implementation Plan
- Sports and Active Recreation Strategy
- Artificial Turf
- Dog Parks
- Water Fountains
- Municipal Integrated water management
- Open Spaces and Mobility
- Lighting in Open spaces
- Arts in Open Spaces

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submitted on behalf of Climate Action Merribek

Expansion of Definition:

Open space includes:

- public parks, sports fields, playgrounds,
- creek corridors
- Car parks, Streets, roads and footpaths.
- Restricted access such as some sports fields, golf courses, schools,
- cemeteries, rail easements.

The present discussion paper does not include car parks and streets, yet these are a substantial proportion of open space in the municipality. Car parks and streets are important to note as open space, even though they are used primarily for transport and vehicle parking. Use and utility of car parks and road space can change either temporarily (think Sydney Road Street Party) or permanently (such as footpath expansion for trees or cafe/business outside seating, adding canopy trees to car parks).

The allocation of road space can also change due to changing use/needs for different mobility modes. This is what needs to happen to increase safety of vulnerable road users – pedestrians and cyclists – and to enable the more sustainable, liveable and resilient vision contained in the Merri-bek Community Vision 2021 – 2031¹.

Drivers of change

Increasing population density is an important driver for more efficient and effective use of open space to increase health and liveability.

Climate Change is increasing temperatures and extreme heat events. Longer, hotter, more intense heatwaves. Shorter winters. Less autumn/winter rainfall is the long term trend. But when it does storm, rain events are likely to be more intense, increasing flash flooding risk. Increasing temperatures and extreme weather events also impacts urban ecosystems, urban wildlife and biodiversity.

Importance of sustaining nature, biodiversity, wildlife corridors in the urban environment. This also produces health co-benefits. Maintaining vegetation, wildlife corridors and waterways in good condition means these spaces can act as refugia areas for wildlife during extreme weather conditions.

Growing importance of sustainability and circular economy criteria for open space surfaces and use.

Increase in population is a driver of increasing sports use demand for sports surfaces, but there is also likely to be greater demand for informal sports and active recreation. This highlights need to maintain sports surfaces as multi-use as much as possible, and keep them natural where they can deliver multiple environmental services.

More canopy shade is needed to reduce Urban Heat Island Effect. Council is already implementing an Urban Forest Strategy addressing this issue,

¹ Merri-bek Community Vision 2021 – 2031 <https://merri-bek.vic.gov.au/globalassets/website-merri-bek/areas/my-council/about-council/merri-bek-2021-31-community-vision/merri-bek-community-vision-2021-2031.pdf>

Maintaining or installing water features can also contribute to local mitigation of urban heat.

Canopy shade and public water fountains for active transport routes are important and should be addressed. We note the failure of the Level Crossing Removal Project at Merlynston car park upgrade to consider best practice for reducing urban heat in the new car park, providing only very limited tree canopy for most of the Upfield bike path.²

Importance of Integrated catchment water management and water sensitive urban design (WSUD). Need for Porous surfaces, manage/limit hard surfaces. Implement water harvesting and storage.

Policies regarding keeping sports fields that use drought tolerant cultivars irrigated during droughts are needed rather than the blanket irrigation bans that were applied to watering sports fields during the millennium drought. There needs to be a recognition that living grass provides multiple environmental services, even during a drought, including sustaining biodiversity and reducing urban heat.

Carbon sequestration in open space to meet goal of net negative emissions by 2040³. Numerous research shows that grass can operate as a substantial carbon sink from 0-50 years. Sports turf, due to increased maintenance regimes, is likely more marginal for carbon sequestration.

Care for country, explore traditional land care philosophies in cooperation with traditional owners. This particularly applies with vegetation management. Implementing cool burns of grassland ecosystem areas in the municipality.

Waterways of Merri-bek

The Merri Creek, Moonee Ponds Creek, Westbreen Creek, Merlynston Creek and Edgars Creek are all important waterways providing important habitat and recreational opportunities.

Listing all the waterways on Page7 of the discussion document ignores Campbellfield Creek. This is a creek that starts up in Hume LGA between the Maygar Greybox woodlands Reserve and The Meadows (Greyhound racing), flows under the M80 where it passes through Northern Memorial Park, then into the Melbourne Water flood retention basin wetlands, then an open drain parallel to Sages Road, before it goes underground at Box Forest Road flowing under Fawkner to meet Merri Creek near the bottom of Fawkner at Queens Parade and Derby street.

At one stage it flowed into Merlynston Creek in Fawkner Cemetery, but this watercourse was changed by underground drainage from Box Forest Road to Merri Creek.

The Creek may be in poor condition, but that is no reason to ignore its existence as a minor waterway of Merri-bek providing some environmental services in open space.

In particular the Campbellfield Creek flood retention basin wetlands managed by Melbourne

2 See Dr Sebastian Pfautsch et al in Despicable Urban Spaces: Urban Car parks (Feb 2022)
<https://doi.org/10.26183/7q7a-f148>

3 Zero Carbon Merri-bek 2040 Framework
<https://zerocarbonmerri-bek.org.au/wp-content/uploads/2022/10/Merri-bek-Zero-Carbon-2040-Framework-Revised-October-2022.pdf>

Water operates as a refugia space for a mob of about 3 dozen eastern grey kangaroos that roam Northern Memorial Park. These are the only Eastern Grey kangaroo mob fully resident in Merri-bek municipality.

Open Space Strategy 2012 Implementation Plan

Before discussing the future strategy, we should look at the implementation plan of the 2012 strategy.

In both the 2004 and 2012 Open space strategies there was an action to develop a Biodiversity strategy. When the 2012 strategy update happened this action was just carried forward. It should have been highlighted as an unaddressed action, but wasn't. It was only as a result of questions asked at Council from the public gallery in 2018 and 2019 that this was brought to the attention of Council staff and Councillors, and budget allocated for development of the strategy, with the Nature Plan adopted in 2020 the result.

So the 2012 Implementation Plan (page 90 of 2012 Strategy)⁴ needs to be gone through item by item. Council officers need to work through all action items in the 2012 strategy, identify which ones have been acted upon, and whether fully, partially or ongoing, and identify any actions that have not been addressed and highlight these for the public and Councillors.

We have gone through the 2012 implementation plan and identified some that more information on the status should be provided:

- Implement Moreland's Lighting Strategy focusing on entrances, buildings and paths where they provide a thoroughfare through parks, on shared trails at intersecting paths (minimal safety lighting to protect habitat values), for sport (as appropriate) and lighting will be of best practice environmental efficiency. Ongoing ESD. What is the status of this?
- Develop a Memorials and Monuments Policy for open space and the public realm. Short. Governance, Open Space Design & Development. What is the status of this?
- Review and assess usage and method of application of herbicides, fertiliser and other chemicals in open space with a view to minimizing impacts on non-target species and stormwater quality. Ongoing Open Space Maintenance. What is the ongoing status of this?
- Review the Upfield Line Habitat Landscape Plan (1998) to develop in partnership with the community the Upfield shared trail as a habitat corridor. What is the ongoing status of this?
- Develop a policy on appropriate use of water on open space considering environmental and social needs for keeping active / passive spaces green, and sustaining landscape values. Short. Open Space Design & Development. What is the status of this? Council needs to be prepared for another lengthy drought when water restrictions may again be imposed. Sports fields should not be absolutely cut off from all irrigation as this is a

4 See Implementation Plan from Page 90 of Merri-bek Open Space Strategy 2012-2022 <https://www.merri-bek.vic.gov.au/globalassets/key-docs/policy-strategy-plan/open-space-strategy-2012-22.pdf>

misplaced policy that does not recognise the cooling benefits and other environmental services that grass provides.

- Develop pedestrian/cycle link between Moonee Ponds Creek trail and Karin Court, Glenroy. Medium. Transport. What is the status of this?
- Review Resting Places Strategy and implement. Short Open Space Design & Development. What is the status of this?
- Create links to open space and trails from activity centres. Short. Place Design & Strategy. What is the status of this?
- Develop east / west routes to connect the Upfield Rail shared path and identified habitat corridors to the paths along the Merri and Moonee Ponds Creeks, and other waterways. Long. Open Space Design & Development / Transport.
What is the ongoing status of this? Keep in mind the Victorian cycling strategy (2018) argues for dedicated or protected cycling lanes are needed. Shared paths should only be implemented where use level is low.

These are just some of the action points identified that information should be provided on, but all the action points should really be considered and reported back to Council on as part of the strategy update.

Sports and Active Recreation Strategy

We note the Sports and active recreation strategy 2020 does not cover any climate risk management.

Participants in sports and active recreation are already feeling the impacts of climate change due to extreme heat. Sports surfaces and facilities are being affected through extreme heat, heavy rainfall and drought.

This is a major oversight in governance. If there is silence on problems, it hinders finding possible solutions.

Artificial surfaces

The 2012 Open Spaces Strategy flags potential issues with synthetic turf, including around heat, change in the type of injuries and loss of environmental benefits, but those benefits were never quantified and explained.

Here is what the 2012 open space strategy says on Synthetic turf:

Pg 23: “There has also been a shift to using artificial turf to replace natural turf, particularly for high intensity sports and social spaces (including kindergartens). Although this provides a year round surface, it is a relatively expensive option for grass replacement. The value of artificial turf needs to be weighted up with issues of high temperatures emanating from the surface, maintenance costs, change in types of injuries, and the loss of the environmental benefits of the natural surface all need to be considered.”

pg 76. “Synthetic turf can be considered in some circumstances although should not be seen as the only alternative to dealing with difficult conditions.”

The Victorian Government Sports and Recreation Department issued their Artificial Grass for Sports Guide in February 2011 which contained two and a third pages on potential environmental and health impacts. There has been a lack of any further guidance by the Victorian Government, or establishment of a knowledge base on artificial turf environmental and health impacts since that time.

In particular, microplastics pollution and its growing environmental impact and cumulative health risk of microplastics have been very active areas of recent research.⁵ The NSW Chief Scientist report clearly identified substantial knowledge gaps in the chemical composition of synthetic fields.⁶ While there are methods to reduce microplastics pollution associated with water runoff and player carry-off, airborne microplastics is much more difficult to counter. We know microplastics are airborne, with one source being synthetic fields, but there has been no quantitative study of the extent of this pollution.

There has been substantial research over the last decade highlighting health and environment concerns and also revealing substantial knowledge gaps, which makes accurate risk assessment more difficult. This includes most recently the 539 page report on Synthetic Turf by the Office of the NSW Chief Scientist and Engineer completed in October 2022, published 9 June 2023.

Merri-bek Council has commissioned a consultants report on Sports Surfaces, including a decision framework. This report is due to be presented to Council in August 2023. This should be used to inform Council about use of artificial turf in open spaces and possible alternatives.

Council should take a precautionary approach with regards to installation or resurfacing artificial turf given our assessment below:⁷

What is wrong with Artificial turf?

- Derived from fossil fuel petrochemical industry
- Produces greenhouse gas emissions during all stages of lifecycle
- Problematic to recycle, Increases landfill at end of life
- Produces microplastics pollution (Both waterbased and airborne)
- Heat health, thermal comfort impact. Adds to urban heat island effect
- Replaces natural grass. soil organic carbon sequestration, oxygen
- Reduces soil biota, insects: trophic impact on local biodiversity.
- Compacts the soil increasing stormwater runoff
- Toxic Chemical leachates from fibre & rubber infill pollute waterways
- Air pollutants and odours
- increased lower extremity injuries

5 See for example this March 2023 academic research on airborne microplastics: Abad López, Angela Patricia, Trilleras, Jorge, Arana, Victoria A. , Garcia-Alzate, Luz Stella, Grande-Tovar, Carlos David., (March 2023) Atmospheric microplastics: exposure, toxicity, and detrimental health effects, RSC Adv., 2023, 13, 7468-7489 doi.org/10.1039/D2RA07098G <https://pubs.rsc.org/en/content/articlehtml/2023/ra/d2ra07098g>

6 NSW Office of the Chief Scientists and Engineer, Synthetic Turf in Public Spaces Final Report (October 2022) https://www.chiefscientist.nsw.gov.au/_data/assets/pdf_file/0004/542263/CSE-Synthetic-Turf-Review-Final-Report.pdf

7 Climate Action Merribek, 19 June 2023, Artificial turf a cause for concern revealed by NSW Chief Scientist report on Synthetic Turf. <https://climateactionmoreland.org/2023/06/19/artificial-turf-a-cause-for-concern-revealed-by-nsw-chief-scientist-report-on-synthetic-turf/>

- Long term human health impacts uncertain
- Enhances potential infection transmission risk.
- Appears to improve water conservation, but the situation is complex
- Increased fire risk, flood risk
- Reduced community amenity for multifunction/informal use
- Infill and fibres contain rich chemical mix. Includes PAHs, VOCs, PFAS

Artificial turf : Plastics from fossil fuel gas processing

- Plastics production is seen by Fossil Fuel sector as a growth area. On current trends, annual production of fossil fuel plastics will nearly triple by 2060 to 1.2 billion tonnes (Yahoo News/AFP 21 June 2023)⁸
- Petrochemical companies seek to pivot their business models to encompass the ‘circular economy’ and ‘sustainability’⁹
- Latest climate research: Plastic must be reduced by at least 75% by 2050 (PDF). This includes phasing out single-use plastic by 2040 and curbing durable plastic.¹⁰

Artificial turf : a rich Chemical cocktail

- Fibres: Polyethylene / Polypropylene / nylon
- Matting: Polyurethane
- Infill: Crumb Rubber, sand, TPE, EPDM, R-EPDM, organic (cork/coconut husk)
- Plastics contain many chemical additives: Plasticizers, flame retardants, biocides. Chemicals identified in artificial turf, including polycyclic aromatic hydrocarbons (PAHs), phthalates, and per- and polyfluoroalkyl substances (PFAS), are known carcinogens, neurotoxicants, mutagens, and endocrine disruptors. Heavy metals also present, most common is zinc.
- Crumb Rubber: polycyclic aromatic hydrocarbons (PAHs), metals, plasticizers, such as phthalates, and bisphenol A (BPA)
- Accurate Chemical content of artificial turf plastics unknown, unregulated. Crumb Rubber infill chemicals are also unregulated.

Artificial turf poses health risks

- Health risk assessments conclude AT a low health risk to adults. Health Risk management used rather than precautionary risk.
- Studies confirm increased lower extremity injuries
- Long term health risk still uncertain, with many knowledge gaps
- The only human epidemiology studies conducted related to artificial turf have been highly limited in design, focusing on cancer incidence.
- Children at greater health risk, “No studies have addressed children’s exposure to chemicals from artificial turf surfaces via oral and dermal routes.” (ICAHN School of Medicine – Children’s Environmental Health Centre¹¹
- “Specific lack of empirical evidence around indirect and longer-term cumulative health impacts with a general lack of field studies, epidemiological studies and health risk

8 See Yahoo News/AFP news story (21 June 2023), 'Time bomb?': Race to identify health effects of microplastics, <https://news.yahoo.com/time-bomb-race-identify-health-094805481.html>

9 See the extensive research by Professor Alice Mah, including her 2022 book Plastics Unlimited https://warwick.ac.uk/fac/soc/sociology/staff/alice_mah

10 See Chen, Xuejing, Kristen McDonald, Madeline Rose, Pacific Environment, 23 May 2023, “Stemming the Plastic-Climate Crisis: Paris Alignment for Plastics Requires at least 75% Reduction,”, <https://www.pacificenvironment.org/wp-content/uploads/2023/05/Stemming-the-Plastic-Climate-Crisis-1.pdf>

11 ICAHN School of Medicine – Childrens Environmental Health Centre – 25 June 2021 letter <https://villagegreennj.com/wp-content/uploads/2021/07/Mount-Sinai-Letter-to-Maplewood-Township-June-2021.pdf>

assessments in the Australian context.” (NSW CSE report Page 47.)

Artificial turf poses Environmental risks

- Produces microplastics pollution (Both waterbased and airborne) from fibres and infill as it weathers and degrades.
- Microplastics hacky structure means it can become a vector for toxic chemicals, heavy metals and even viruses.
- Microplastics impacting aquatic and terrestrial ecosystems, pass up the food chain.
- Humans can inhale, or ingest from the foodchain. Microplastics may accumulate. Nanoplastics now found in human blood, may pose a serious danger in lower intestine¹². Long term human health impacts are unclear, being actively researched.
- Many leachate chemicals already polluting and changing aquatic ecosystems.
- Artificial turf is flammable. Poses a bushfire risk.
- Flood events can cause major damage and significant water pollution
- Adds to urban artificial surfaces reducing species biodiversity, especially birdlife
- Artificial light upgrades can impact local biodiversity & nocturnal behaviours
- Adds to local Urban Heat Island, may affect nearby residents including household energy use

Artificial Turf, wet weather & microplastics pollution

NSW CSE Hydrology report (Appendix 4): Sports clubs argue advantage of wet weather sports use, but use of synthetic turf during wet conditions has been found to exacerbate infill loss microplastic pollution and should be avoided.

“Reducing exposure during wet conditions when infill transport is highest [104, 105, 113]. Considering that the ability to play in wet conditions is a major advantage of ST fields, it is unlikely that play will be minimised when the field is wet. However, ideally maintenance should be avoided during wet conditions, and this was shown by Regnell (2018) to result in a reduction of infill material on the maintenance vehicle from 24.1 kg to 12.4 kg per brushing session”(NSW CSE report)

End of Life/Recycling of artificial turf:

NSW CSE report recommendations included:

R2.1 - End of Life Management Plan is needed and should be consistent with state legislation on waste, recycling and circular economy.

R2.2 - “The practice of cutting up EOL sporting fields for use in other settings should not be approved as an acceptable EOL plan”

An artificial Turf manufacturer is currently establishing mechanical separation AT recycling, but there is a question over will this cause further contamination given the unknown chemical cocktail nature of synthetic turf from different sources. Sustainability Victoria has provided \$500,000 initial funding in 2022 to setup this recycling venture. Possible presence of PFAS & other toxic chemicals raises questions whether mechanical recycling even feasible, given risk of furthering toxic contamination spread. The only established recycling known to be

12 See Science Alert, 26 June, 2023, Microplastics May Pose a Serious Danger to The Intestine, <https://www.sciencealert.com/microplastics-may-pose-a-serious-danger-to-the-intestine>

Also Science Alert (June 2022) It's Official, Microplastics Were Found Circulating in Human Blood For The First Time <https://www.sciencealert.com/four-out-of-five-people-tested-were-found-with-plastic-floating-in-their-blood>

happening is in Europe.

Hybrid Turf

NSW CSE 3.3.4 Recycling methods for synthetic turf: "There is not much information available about suitability or methods to recycle hybrid turf. The Review has been advised that recycling hybrid turf may be more complex in applications where natural turf is combined with synthetic materials, either by attachment to a mat or where it is in growing amongst a base of synthetic turf fibres." - (NSW CSE report PDF)

Are there alternatives to Artificial Turf?

- Well maintained, improved natural turf can provide sports capacity up to 35-40 hrs / wk to meet demand.
- Needs State level guidelines on cultivars, natural turf maintenance, soil improvement, irrigation, drainage.
- Natural turf is good for soil health, supports biodiversity, ameliorates urban heat island effect on local microclimate by evapotranspiration.
- Natural turf fits with long term sustainability and circular economy goals. No end of life issues.
- Bioplastics turf may become available, but will likely still have heat issues, and other environmental issues

Artificial Turf in Schools

Use of artificial turf in education environments is highly problematic, posing health burn and thermal comfort risks, inhalation and ingestion of microplastics and air pollutants, also potentially affecting child learning capacities.¹³

Dog Parks

We note the data provided on the rising trend of registered dogs in the municipality. There needs to be a range of infrastructure in open space to cater to increased dog ownership. This includes:

- specific off-lead areas
- areas where dogs need to be on-lead
- Fenced dog parks, with separate areas for large dogs and small dogs

Appropriate signage is needed for both off-lead dog areas and where leads are necessary. This may include times or restrictions where areas are shared for other uses such as organised sport.

Fenced dog parks need to have water access and the gate latches need to be disability friendly. Existing Fenced dog park gate latches could be improved for disability access.

13 See NSW CSE Pfautsch and Wujeska-Klause (Appendix 7 of CSE report PDF),
https://www.chiefscientist.nsw.gov.au/_data/assets/pdf_file/0004/542263/CSE-Synthetic-Turf-Review-Final-Report.pdf
Pfautsch S.,et al (Sept 2020) School Microclimates
<https://researchdirect.westernsydney.edu.au/islandora/object/uws:57392>

Water Fountains

Climate change is increasing temperatures, especially during Spring, Summer and Autumn. Winter seasons are growing shorter.

Our municipality is substantially built up so the urban heat island effect is stronger. In 2018 most of the municipality was measured in the bandwidth of 5-10C urban heat, with some areas at the 10-15C bandwidth. Much of the municipality has a high heat vulnerability index.¹⁴

Extreme heat events can amplify the urban heat island impacts.

Merri-bek has a high heat vulnerability index, which makes many vulnerable groups susceptible to heat impacts on their health.¹⁵

Provision of public water fountains are an important adaptation to maintain heat health, allowing people to maintain hydration. They also reduce plastic bottle purchase and reduce plastic pollution.

Public drinking water fountains are also used by wildlife to keep cool during hot weather.

This is the reason Climate Action Merribek has been campaigning for more public drinking water fountains since 2014, including our most recent successful community budget suggestion for increased public water fountains installation in the strip shopping centres around the municipality.

Municipal Integrated water management

Australia is moving into a period of greater weather extremes. Longer, more intense droughts such as the Millennium drought. More intense periods of rain such as the current triple La Nina event which adds to riverine flooding and flash flooding.

We need to better manage water in both extreme rainfall events and longer drought events through management of open spaces. This includes consideration of hard surfaces, porous surfaces. Harvesting and storing excess water for use in nurturing natural surfaces.

Organised sports may need to come to terms that usage of sports surfaces should be restricted by weather events to prevent undue wear and damage of natural turf, or excess microplastics pollution from synthetic fields in wet conditions.

Council appears to be working in the right direction with integrated water management of open public spaces.

There is a place for local residents, business, especially industrial warehouses to increase water harvesting from roofspace to use as greywater for washing surfaces or watering gardens and vegetation.

14 See Cooling and Greening Melbourne Map, Planning Department showing data for 2014 and 2018. <https://www.planning.vic.gov.au/guides-and-resources/data-and-insights/cooling-and-greening-melbourne-map>

15 See Margaret Loughnan et al (March 2013) A spatial vulnerability analysis of urban populations during extreme heat events in Australian capital cities, NCCARF, https://nccarf.edu.au/wp-content/uploads/2019/03/Loughnan_2013_Spatial_vulnerability_analysis.pdf

Open spaces and mobility

Open spaces are utilised for sports and for recreational and commuting transport.

Shared Use paths are important ways to explore open spaces. These are adequate where cycling and pedestrian use is low. Where use of light mobility aids and pedestrian use is high, the different modes need to be separated. The Victorian bicycle strategy (2018-2018) articulates the strong need for separation of pedestrians and cyclist traffic¹⁶.

There needs to be development of dedicated paths or protected lanes for light mobility vehicles, which includes bicycles, scooters, mobility scooters, e-bikes. Some of this can occur through the reallocation of road space to create protected bike lanes. Sometimes dedicated paths may be needed as routes through parkland.

Active transport mobility routes need to provide reasonable canopy shade and provision of occasional seating.

We were happy to see the recent installation of many more seats along the Merri Creek Trail offering a chance for walkers to sit and rest: a community suggestion from 2022. This is particularly important for more elderly people to utilise open space areas.

Lighting in Open Spaces

Lighting in open spaces needs careful assessment and tailoring to particular locations.

While providing lighting is important for increasing safety, it can also have impacts on wildlife and biodiversity.

Lighting for sports fields needs careful assessment as additional lighting for night time games or training can affect behaviours of nocturnal wildlife.¹⁷

Sports field lighting can also be an imposition on residents in the vicinity, particularly young families trying to get children to settle in a bedtime routine.

Arts in Open Spaces

Use of open spaces for arts or cultural events is to be encouraged. The Moreart event along the Upfield path successfully linked in arts across multiple suburbs. Events like these bring us together as a community.

16 See Victorian Cycling Strategy 2018-28 (December 2017)
<https://dtp.vic.gov.au/-/media/tfv-documents/walking-and-cycling/victorian-cycling-strategy-2018-28.pdf>

17 See Appendix 16 Environmental lighting and heat impacts , School of Life and Environmental Sciences, The University of Sydney , Professor Dieter Hochuli, Dr Caragh Threlfall , School of Biological, Earth and Environmental Sciences, UNSW Sydney , Dr Mariana Mayer Pinto contained in NSW Chief Scientist and Engineers Report on Synthetic Turf
https://www.chiefscientist.nsw.gov.au/_data/assets/pdf_file/0004/542263/CSE-Synthetic-Turf-Review-Final-Report.pdf

About Climate Action Merribek

We are a Merri-bek based grassroots community organisation focussed on climate advocacy to all three levels of government and also to the UNFCCC internationally. We have been meeting and working to advance climate action in Merri-bek since 2008.