



PUBLIC WORKS DEPARTMENT

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CITY COUNCIL INFORMATIONAL MEMORANDUM

Date: August 29, 2024

To: Cupertino City Council

From: Pamela Wu, City Manager, Chad Mosley, Director of Public Works, Ursula Syrova, Environmental Programs and Sustainability Manager

Re: Artificial Turf

Background:

At the March 19, 2024, City Council meeting, Councilmember Moore requested information on artificial turf and its environmental concerns.

Makeup of Artificial Turf

Artificial turf consists of a layer of underfill material such as sand or ground concrete, a drainage layer, a backing layer that the plastic grass is attached to, and infill material that make the blades of plastic stand up. The plastic blades of grass are generally made from nylon, polypropylene, or polyethylene. The infill material is often ground up tires (“crumb rubber”) or alternative materials including silica sand or other plant-based products such as a combination of coconut fiber and cork. The infill material is what keeps the plastic blades upright and this material must be replaced as it gets tracked out and needs to be de-compacted periodically.



Environmental Concerns About Artificial Turf

Knowledge of the full impact of artificial turf is beyond the staff's expertise. However, staff conducted a review of available studies and several peer-reviewed scientific studies to compile a summary of the concerns with this product, focusing on a various area:

- 1) PFAS: Per- and Polyfluoroalkyl Substances (PFAS) that may be in (and leach from) the plastic grass or coatings on the infill, per the EPA and the Toxics Use Reduction Institute: <https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas>.
<https://www.turi.org/publications/per-and-poly-fluoroalkyl-substances-pfas-in-artificial-turf-carpet/>.
- 2) Microplastics: Loss (shedding) and degradation of the plastic grass leading to microplastics in the environment per a study in Spain:
<https://www.newscientist.com/article/2383869-huge-amounts-of-plastic-from-artificial-grass-end-up-in-the-sea/>;
<https://www.sciencedirect.com/science/article/pii/S0269749123010965>.
- 3) Chemicals in the infill: Chemicals and heavy metals in the crumb rubber or other infill materials that are tracked out of the artificial turf or otherwise come into contact with people and animals using the fields per the EPA:
<https://www.epa.gov/chemical-research/federal-research-recycled-tire-crumb-used-playing-fields-and-playgrounds>.
Additionally some infill products are coated with a plastic polymer which can be embedded with an antibacterial such as triclosan (<https://www.microban.com/usgreentech>) which presents exposure concerns per the National Center for Biotechnology Information (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4270264/>).
- 4) Heat islands: Temperature of the artificial turf, which can be hotter than asphalt per the San Francisco Estuary Institute:
https://www.sfei.org/sites/default/files/biblio_files/MPSP_Ecology_20_04.pdf.
- 5) Disposal: No recycling infrastructure exists for artificial turf.

Agencies and Organizations Investigating the Safety of Artificial Turf

- The Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry and the U.S. Environmental Protection Agency, in collaboration with the Consumer Product Safety Commission launched a study in 2016 focused on the use of tire crumb in playing fields:
<https://www.epa.gov/chemical-research/federal-research-recycled-tire-crumb-used-playing-fields-and-playgrounds>;
<https://www.epa.gov/system/files/documents/2024-04/tcrs-exposure-characterization-volume-1.pdf>.
- The California Office of Environmental Health Hazard Assessment (OEHHA) is conducting a study of the potential health effects from chemicals released from turf products containing waste tire material. This study will expand upon an earlier study contracted by CalRecycle and is ongoing as of 2024:
<https://oehha.ca.gov/media/downloads/faqs/turfstudyfactsheet082016.pdf>.

- The Connecticut Department of Public Health reported on a study in 2015 and references a number of other state and international studies, including Massachusetts, New Jersey, New York (State and City), Washington State, and Norway: <https://portal.ct.gov/dph/environmental-health/environmental-and-occupational-health-assessment/artificial-turf-fields>.
- In May 2024, the City of Los Angeles City Council formally requested that staff research the topic and provide recommendations to transition away from future installations of artificial turf: https://clkrep.lacity.org/onlinedocs/2024/24-0602_misc_5-24-24.pdf.
- In August 2023 the Santa Clara County Medical Association examined the issue and issued a natural turf recommendation to the County Board of Supervisors: <https://www.sccma.org/LinkClick.aspx?fileticket=C0f6wf5p9uY%3d&portalid=1>.
- In April 2024, the Santa Clara County Board of Supervisors voted to study the ramifications of artificial turf on county land and received seven written comments against artificial turf: <https://www.youtube.com/watch?v=nWFaO8njhiA>.
- In October 2023 the City of Sunnyvale received over 45 negative or concerned comments about the use of artificial turf when considering a park remediation project and ultimately voted to install natural turf and discussed researching the issue more broadly: <https://sunnyvaleca.legistar.com/View.ashx?M=M&ID=1073882&GUID=DB3E0758-AA63-4C13-AC44-BF48E913A575>.
- The City of Millbrae passed an ordinance prohibiting the installation of artificial turf in October 2023: <https://portal.laserfiche.com/Portal/DocView.aspx?id=49731&repo=r-c2783ec8>. It requires existing installations to be replaced with natural turf once they begin to show wear and it notes that, “Areas adjacent to existing synthetic installations must be kept clean and free of plastic blades, netting and crumb rubber at all times.”
- San Marino in southern California has also passed an ordinance establishing and extending a moratorium on artificial turf. <https://cms9files.revize.com/sanmarinoca/O-23-1410%20Extending%20the%20Term%20of%20Ordinance%20No%20O-21-1385-U,%20Establishing%20a%20Temporary%20Moratorium%20on%20the%20Installation%20of%20Artificial%20Turf%20and%20Synthetic%20Grass.pdf>
- In July 2024 the Fremont Union High School District board of trustees voted to continue use of artificial turf sports fields despite some parents and community members raising health concerns: <https://www.mercurynews.com/2024/07/18/artificial-turf-fields-to-remain-at-cupertino-sunnyvale-high-schools/>.
- The Sierra Club supports policy to ban artificial turf and has made appeals on that point to several jurisdictions, including Palo Alto and Mountain View: <https://www.sierraclub.org/loma-prieta/opposing-artificial-turf-mountain-view->

[city-council-february-26-2024; https://www.sierraclub.org/loma-prieta/adding-study-moratorium-artificial-turf-palo-alto-parks-and-recreation-fiscal-year-2025.](https://www.sierraclub.org/loma-prieta/adding-study-moratorium-artificial-turf-palo-alto-parks-and-recreation-fiscal-year-2025)

Additional Considerations

Based on information from articles cited above, artificial turf raises other concerns as well, including injuries (structural and skin abrasions), inhalation of toxins (breathing in dust from the tire crumb, sand, or other infill), maintenance costs, and water usage. Artificial turf requires maintenance to keep the plastic blades upright and springy, to correct consistency and volume of the infill, removal of debris, periodic cleaning, and sanitizing, weed control, and (in some settings) irrigation to cool it off. The initial installation of artificial turf involves significant expense. When adding the replacement cost of artificial turf, which has a typical lifespan of 10 years, the cost of artificial turf over the long term may be more than natural turf. Another consideration raised particularly in relation to sports fields is the hours of use, as artificial turf may allow more hours of play compared to natural turf. However, certain exterior uses or situations may not be feasible for natural turf installations.

The information presented here is intended to provide findings from credible sources without staff recommendation.

Sustainability Impact

Biodiversity and a healthy ecosystem are noted co-benefits of greenhouse gas reduction measures. Notably, from page 54 of the City's Climate Action Plan 2.0, "Actions that improve the health of local ecosystems can also result in a variety of public benefits including reducing pollutants in local creeks and runoff to the bay, providing species habitat which supports a more biodiverse landscape, improving water and air quality, reducing local flood risk, and providing recreation benefits for the community enjoyment." Natural turf would support those goals. Natural turf also sequesters carbon.

The PFAS, microplastics, and 6PPD-quinone (which is created when 6PPD, a chemical that prevents automotive tires from degrading, reacts with ozone in the air) are all emerging contaminants noted in the California Regional Water Quality Control Board San Francisco Bay Region Municipal Regional Stormwater NPDES Permit.

Prohibiting Artificial Turf

Given the perceived negative impacts to both human health and the environment, jurisdictions including Santa Clara County, Los Angeles, and the City of Sunnyvale are considering prohibitions on the installation of artificial turf. Under SB 676, local agencies are allowed to prohibit artificial turf, repealing an earlier water conservation law. AB 1423, which would have prohibited schools from purchasing or installing a covered surface containing PFAS, was vetoed.

Fiscal Impact

Cost comparisons of various applications of natural turf versus artificial turf for residential and other small settings could be prepared. Existing literature focused primarily on sports fields.

Prepared by: Ursula Syrova, Environmental Programs and Sustainability Manager

Reviewed by: Chad Mosley, Director of Public Works

Approved for Submission by: Pamela Wu, City Manager