



Four Key Reasons to Choose Natural Grass over Artificial Turf for Sports Fields: Health & Safety, Environmental Impact, and Cost

Since the 1960s, artificial turf has crept its way into our parks and playing fields. Its gain in popularity can be attributed to lucrative marketing campaigns and false notions that it's better for the environment and safer to play on. However, many studies have found that artificial turf can pose health, safety, and environmental concerns as well as cost more than expected.

"The artificial turf industry has made a lot of money claiming that their product is perfectly safe, and there's really growing evidence that that's not true."

~ Diana Zuckerman, President of the National Center of Health Research¹



HEALTH & SAFETY

Natural Grass Fields are related to lower injury rates and fewer chemicals



INJURY RATES

Studies by the American Journal of Sports Medicine² have shown that more lower extremity injuries occur on artificial turf fields among NFL and NCAA athletes versus natural grass fields. Another study found the injury rate to be 16% higher on artificial turf. University Hospitals, Case Western Reserve University and UH Sports Medicine Institute³ found that during the 2017-18 season, high-school athletes were "58% more likely to sustain an injury during athletic activity on artificial turf."

CARCINOGENIC HAZARDS

The crumb rubber pellet materials used for infilling artificial turf fields have long been studied for their cancer-causing risks. Research results are pending from the CA office of Environmental Health Hazard Assessment⁵ as well as other studies regarding the health impact of artificial turf fields. Considering that children and athletes may ultimately spend hours playing on, rolling around on, falling on, diving on and possibly swallowing these materials, it's certainly worth waiting on the results of these studies before spending large amounts of money installing a product that could potentially need to be torn out because of its inherent cancer risks and related liabilities.

Additionally, PFAS are usually found in artificial turf. The Environmental Protection Agency has found that there is virtually no safe level of several PFAS that should be used. PFAS have been linked to changes in cholesterol and liver enzyme levels, changes in the immune system and response to certain vaccines, and increased risk to certain cancers according to The Agency for Toxic Substances and Disease Registry (ATSDR)⁶.

Mount Sinai Children's Environmental Health Center⁴ ***"recommends against the installation of artificial turf playing surfaces and fields due to the uncertainties surrounding the safety of these products and the potential for dangerous heat and chemical exposures."***

PFAS, Perfluoroalkyl and Polyfluoroalkyl Substances, are manmade chemicals that are:

- **Persistent:** they do not break down in the environment
- **Bioaccumulate:** the amount builds up over time in the blood and organs



ENVIRONMENT

Natural Grass is cooler, and benefits, rather than pollutes, the environment

TEMPERATURE CONCERNS

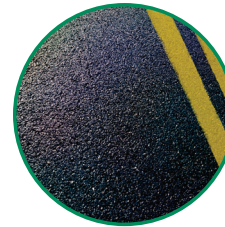
Natural grass cools the environment while artificial turf retains heat and has been found to be up to 40%-70% hotter than natural grass. This can lead to dangerous playing conditions for users of any age. These artificial surfaces are unable to self-cool through water vapor and evaporation like natural surfaces leading to extreme heat conditions which can result in heat exhaustion and heat stroke. Also, because artificial turf retains that heat for longer, users are more likely to experience skin burns. A study by Brigham Young University⁷ found that the "surface temperature of artificial turf was 37° F hotter than asphalt, and 86.5° F hotter than natural [grass] turf."

Natural Grass



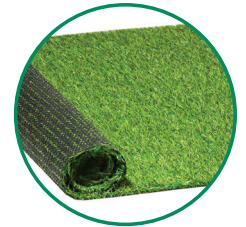
87.5°F

Asphalt



137°F

Artificial Turf



174°F

BYU Study



"Emerging research is making it clear that artificial turf poses an environmental threat due to its lack of recyclability and presence of toxins such as lead and PFAS."⁸

~ CA State Senator, Ben Allen

MICROPLASTICS POLLUTION

The synthetic fibers, recycled rubbers and other granular materials that make up artificial turf get carried home in cleats, clothes, and end up in washing machines and ultimately in city and public water supplies. They also get tracked or blown off the field and end up in the environment, streams, and other resources used for public consumption. Ultimately, these torn-out fields end up in dumps, and landfills as they are replaced. The use of artificial turf is simply delaying the disposal of these hazardous materials. In fact, CA and other state legislatures are proposing bills to limit or ban artificial turf.⁸

ECOSYSTEM SERVICES

Artificial turf has shown no positive impact to ecosystems. However, natural grass parks, fields, lawns, etc. show many positive ecosystem contributions. They allow infiltration of rainwater, they capture, filter, and clean storm flow or runoff water from impervious surfaces, they capture carbon, cool our environment, reduce cooling costs from air conditioners, reduce carbon emissions from power plants, restore soils to native conditions, provide a habitat for beneficial arthropods/insects, and more!



Initial and long-term costs for natural grass fields are less than for artificial turf fields

CONSTRUCTION AND MAINTENANCE COSTS

Artificial turf is not maintenance free. Thousands to hundreds of thousands of dollars can be spent on installation and maintenance over a field's lifespan. The following are examples of common maintenance needs:

- Irrigation to cool playing surfaces.
- Maintenance crews to blow and rake accumulated debris like trash and leaves.
- Specialized cleaning and sanitation services for bodily fluids from athletes and waste from animals.
- Replacement needs over time, typically after 8-10 years.



WARRANTY ISSUES AND REMOVAL COSTS

Proper installation by a qualified landscape company is key to the longevity of these surfaces. Wear and tear, failure to maintain, improper footwear, natural occurrences like flooding, etc. can all lead to costly repair and replacement costs over time and these issues can lead to voided warranties. Disposal is also costly as many dumps do not accept these synthetic materials.

False notions that artificial turf is better for the environment and safer to play on are simply marketing propaganda. Given the notable concerns that have arisen regarding these products, it's safe to say that natural grass fields are a clear winner over artificial turf. Natural grass not only offers many positive benefits supporting health and safety, but the positive environmental impact remains unmatched.

For a digital copy of this white paper and links to referenced studies, please scan



In a study regarding average 20-year installation, maintenance, and resurfacing costs, the artificial turf fields studied averaged a cost of \$1,000,000 more than natural grass fields.
~ Sportsfield Management⁹

¹ https://www.espn.com/nfl/story/_/id/38624943/inside-nfl-turf-debate-injuries-safety-measures-more

² <https://pubmed.ncbi.nlm.nih.gov/30452873/>

³ <https://www.uhhospitals.org/for-clinicians/articles-and-news/articles/2019/08/artificial-turf-versus-natural-grass>

⁴ <https://mountsinaiaexposomics.org/position-statement-on-the-use-of-artificial-turf-surfaces/>

⁵ <https://oehha.ca.gov/risk-assessment/synthetic-turf-studies>

⁶ <https://www.atsdr.cdc.gov/pfas/docs/PFAS-info-for-clinicians-factsheet-508.pdf>

⁷ <https://www.nrpa.org/parks-recreation-magazine/2019/may/synthetic-sports-fields-and-the-heat-island-effect/>

⁸ <https://calmatters.org/environment/2023/10/california-synthetic-turf-pfas/>

⁹ <https://sportsfieldmanagementonline.com/2016/09/29/cost-and-playability-analysis-of-synthetic-infill-and-natural-grass-in-or/8242/>