Problems with the Artificial Turf vs. Natural Grass Life Cycle Analysis (LCA)

Throughout the LCA, there were mistakes and incorrect assumptions that little by little added points to weigh in favor of plastic turf over natural grass, so that artificial turf came out just ahead of natural grass. The authors acknowledged many of these points during the joint commission meeting. We are highlighting some of the issues we noted, and many comments made by Sustainability and Parks Commissioners. We highlighted how each issue would have affected the score.

1. **Play Time (Hours of Play):**
    - The LCA was weighted heavily in favor of plastic grass in this category, The LCA claims an increase in hours played on artificial turf, but did not take into account the actual number of cancellations that would occur on plastic grass due to high field temperatures, if those field surface temperatures were actually monitored (not ambient air temperatures, which is the current practice) and game play were halted when field temperatures exceeded 120°F as suggested by the LCA authors. **Synthetic turf is 40-70°F hotter** than surrounding air temperatures on sunny days (our typical weather). Per the LCA, "At present, the Community Services & Parks Department does not plan on irrigating artificial turf fields and as such temperatures of Geofill fields would more likely match the maximum temperatures reached by SBR fields." Also, according to the LCA, the installation of the shock pad will contribute to heat generation significantly. In these conditions, sunny days over 90°F can lead to field temperatures well above 120°F. There were 77 days over 90°F in 2020. Predictive Modeling shows Glendale having 88 days over 90°F by mid-century (2035-2064). The LCA mentions an average of only 40 days over 90°F. There should have been a decreased score given to artificial turf for loss of game play based upon these factors. Natural grass has a cooling effect, rarely exceeding ambient air temperature. Play days restricted due to rain are sadly in decline. **–Artificial Turf** & **+Natural Grass**
    - Did not account for increased high heat days in years to come, due to climate change. **–Artificial Turf** & **+Natural Grass**

2. **Heat Exposure:**
    - Geofill Artificial Turf received a 2 in this category, only because it was being compared with plastic grass with rubber infill, which is irrelevant. It should have scored a 1. **–Artificial Turf**
    - Why did the LCA give a slight score benefit to artificial turf with Geofill, for hydrating the Geofill after three days, when the parks department **will not** be hydrating geofill? The LCA assumed they were not using water when calculating the water use score, so this is inconsistent. **–Artificial Turf**

3. **Cooling Effects:**
    - How does artificial turf with Geofill receive a 2 for cooling effects, when it has no cooling effect unless watered daily? It should have received a 1. **–Artificial Turf**

4. **Water Use:**
    - Park staff do not intend to water the artificial turf regularly, which goes against manufacturer suggested care, and would potentially void the warranty and lead to faster deterioration of the product. Water use was based upon this practice of rarely (if ever) watering and irrigation systems are not planned for any plastic fields. The water use score should have been based upon proper maintenance of the product. Reclaimed water **cannot** be used on artificial turf. **–Artificial Turf**
    - Reclaimed water can be used to water natural grass. It is available at 4 out of the 5 sites, with the fifth site possible. Reclaimed water should be used at all public parks moving forward. This potential at Fremont was not factored in and decreased the score of natural grass in this area. **+Natural Grass**
    - Reclaimed water use benefits Glendale's ground water table. This was not factored in as a benefit of natural grass using reclaimed water. **+Natural Grass**
    - Potential of greywater use and bioswales to capture onsite stormwater and reclaimed water use with a hydroponics style system were not considered. **+Natural Grass**

5. **Urban Heat Island Effect:**
    - While urban air temperature may be different from urban heat island effect - the impact is similar. **Areas around fields are significantly hotter on hot days.** This item was not weighted at all as it was stated that the surface areas were not significant enough to matter and they cool at night; however, one of the studies the LCA references Journal of Applied Meteorology and Climatology noted that "replacing grass ground cover with artificial turf was found to add 2.3 kW h m^{-2} day^{-1} of heat to the atmosphere, which could result in urban air temperature **increases of up to 4°C**" (7° F). Increased ambient daytime temperatures (higher in one area of the city than another thanks to impervious surfaces) are one thing we mean when we talk about "Urban Heat Island", and thus merited scoring. We have shared local heat maps that clearly show the impacts of these large plastic fields such as at the Sports Complex. The LCA acknowledges that heat impacts to specific, highly built, locations should be considered. **–Artificial Turf**
    - The impact of **removing** a cooling element (grass), that reduces the ambient temperature by evaporation and transpiration of plants should have been weighted in this category. In the LCA, it was only considered in terms of Ecosystem Services. For example, the proposal is to remove ⅓ of the natural grass surface of Fremont Park and practically the entire green surface available at Wilson Middle School. This should have shown a benefit of grass in **reducing** the Urban Heat Island and an impact to the overall area to temperature increases when removing natural grass. **+Natural Grass & –Artificial Turf**

6. **Off-Gasing and Dust:**
    - Glendale has committed to using non-fossil powered equipment for its landscaping equipment for all parks and public properties. The gas and diesel issue will be mute as that transition happens. The LCA notes the score for grass would have gone from a 2 to a 3 or 4 if non-gas equipment were used. **+Natural Grass**

7. **End of Life:**
    - The LCA assumed that spent natural grass fields would be landfilled when calculating emissions impact. Current law would prevent landfilling, where the grass would emit methane, and instead require it to be composted or plowed under, thus reducing GHG emissions. **+Natural Grass**
    - The LCA claims that shockpads will be recycled. Shaw only claims the possibility of recycling the blades. The shockpads go to the landfill. **–Artificial Turf**

8. **Maintenance:**
    - The city is testing automated, electric mowers. In terms of maintenance, this should be factored in to boost the score in this category for natural grass. **+Natural Grass**
    - Maintenance must be done regularly on artificial turf. The manufacturer's recommendations are not factored into the LCA. **–Artificial Turf**

9. **Water Pollution:**
    - A minus one in scoring should not have been given to grass re the potential use of herbicides/pesticides. Glendale uses natural products. The LCA based this on the "potential" Glendale changes that policy. Glendale should **never** use herbicides or pesticides where kids are playing. **+Natural Grass**

10. **Stormwater Management:**
    - Storm water percolation and fertilizer runoff should be mitigated for grass fields with bioswaling techniques to prevent runoff, just as parks says it would plan to mitigate artificial turf drainage issues with additional drainage systems. They could mitigate fertilizer or stormwater runoff issues with tactics like bioswaling and integration of water capture systems around the field. Parks says they would not include drainage systems for grass fields. Why not? **+Natural Grass**

11. **PFAS:**
    - Shaw says it doesn't contain PFAS on the Prop 65 list. Prop 65 does not identify chemicals as a class. Each individual chemical must be identified. There are over 1000 PFAS variations, but less than 70 have been placed on the list. That does not mean the other PFAS chemicals are safe. **All** artificial turf installations show PFAS in blades, shockpads, and infill. The presence of PFAS is identified by a test for fluorine in the materials. They got a 3 in this category, when they should have gotten a lower score. "One study tested 8 different synthetic turf fibers,

including Shaw and Turf Factory Direct Brands, and found all tested for fluorine (44-255 ppm)" **–Artificial Turf**

12. Access to Nature

- How does plastic grass achieve a 2 (out of 5) regarding connection to nature? It should receive a 1. **–Artificial Turf**

13. Problems with the Entire Report

- The report has a section on toxicity of turf components. Since that is true, why was the EIR process only done at Woodrow Wilson Middle School and not for the other four fields?
- The inclusion of artificial turf with crumb rubber, which Glendale is not considering, created a false narrative that the Artificial Turf with Geofill was "better than" this other option we are not even considering, thus improving scores in many categories. For example, though the Shaw product showed dangerous temperature concerns, because of product components, addition of shock pad, and lack of watering, it still scored a 2 instead of a 1 in the category of "cooling effects". This is **only** because plastic grass with rubber infill would have scored a 1. Why was the report weighted in this way? Artificial Turf does not cool the environment. Period.
- In all categories, including environmental impacts, the report takes an impact value, and then divides it by the anticipated hours of playing time for each field type. Especially regarding impacts to the environment, this measure makes absolutely no sense. If you pollute the water with microplastics and PFAS, you pollute the water with microplastics and PFAS. If the field creates heat for other park/field users, the field creates heat for other park/school users. If "x" carbon emissions are produced, then "x" carbon emissions are produced. Regardless of the number of field users. Why divide that impact by field hours of play as if that proves reduced impacts to the environment and people?