

Synthetic Turf Cost Benefit Analysis

This cost benefit analysis was prepared to understand the best use of natural or synthetic turf in park and joint use applications. In reviewing the cost benefit analysis you will find the actual dollar cost for construction and maintenance over both a ten year and a twenty year period is less for natural turf than for synthetic turf. This may be unique to our climate, construction, maintenance and programming practices and may not apply to other climates or organizations.

The benefits of synthetic turf in specific applications can outweigh the use of natural turf when certain conditions apply as for example:

- When a site involves intense expanded use throughout the day as with joint use sites where daily use includes school use.
- In sports complexes where there is a high level of competitive play and playing surfaces must be maintained in a consistent high condition.
- In areas where there are high park deficiencies resulting in more extreme levels of use for play or practice.
- Where it is important to reduce water and or chemical use.
- Where a consistently high appearance environment is needed.
- Where park or facilities deficiencies in an area on a site make it difficult to periodically close a field or area for the purpose of renovating or re-establishing a natural turf.
- As a strategy to reduce operating costs.

The following assumptions have been made regarding the typical use of a 2.5 acre multi-purpose field within the city of San Diego.

Annual Use Assumptions:

1. Natural turf will be rested and renovated during the course of the year of programmed use. Using 4 seasons per year with 2 weeks between the winter, spring and fall seasons for field resting and 7 weeks between the fall and winter seasons for field resting and/or renovation, a natural turf field would be available for programmed use 39 weeks per year.
2. Synthetic turf field will not need to be rested and will only be closed 2 days per year for annual replenishment of the infill material.
3. San Diego averages 40 days of rain per year per the National Oceanic and Atmosphere Administration (NOAA).
 - a. Natural turf fields are closed the day of the rain event and 1 day after the event which equals 80 days of field closure per year or 11.4 weeks.
 - b. Synthetic turf fields will be closed the day of the rain event equaling 5.7 weeks per year of field closure. While it is not necessary to close a synthetic turf field during a rain event, it is assumed the recreational leagues will choose not to play in the rain.

Based on these annual use assumptions:

A natural turf field will be programmable 27.6 weeks per year.

A synthetic turf field will be programmable 46 weeks per year.

Annual Field Programming Assumptions:

1. The multi-purpose field has sports lighting allowing nighttime use.
2. The multi-purpose field is programmed from 3 p.m. until 10 p.m. Monday – Friday allowing for 35 hours of programmed use per week.
 - a. Youth sports from 3 p.m. to 6 p.m. = 15 hours per week
 - b. Adult sports from 6 p.m. to 10 p.m. = 20 hours per week
3. The multi-purpose field is programmed from 8 a.m. until 10 p.m. Saturday and Sunday allowing for 28 hours of programmed use per week.
 - a. Youth sports from 8 a.m. to 6 p.m. = 20 hours per week
 - b. Adult sports from 6 p.m. to 10 p.m. = 8 hours per week

These programmable hours equal 63 hours of programmed use per week.

4. The multi-purpose field will be used by 45 participants (three teams) for each hour of use for youth sports practice. (45×15 hours = 675 participant hours per week.)
5. The multi-purpose field will be used by 30 participants (two teams) for each hour of use for youth sports games. (30×20 hours = 600 participant hours per week.)
6. The multi-purpose field will be used by 30 participants (two teams) for each hour of use for adult sports games or practice. (30×28 hours = 840 participant hours per week.)
7. The maximum hours of programmed participant use is 2,115 hours per week.

It is important to note the Annual Field Programming Assumptions above are based on a traditional field programming model. It does not take into consideration non-traditional users such as shift leagues (leagues developed by users which may work at times other than 8 a.m. to 5 p.m.), home school participants or work at home citizens with flexible schedules. While these niche users are currently limited, it is anticipated their numbers will grow in the future which will increase the hours of use of athletic fields.

The following charts are based on the 2.5 acre multi-purpose field used in the water use analysis of the report. This chart does not include the 35 hours per week between 8 a.m. and 3 p.m., Monday through Friday, in which the field may be used for activities other than programmed sports.

Annual Field Maintenance Requirements

Description	Natural Turf Field	Synthetic Turf Field
Weekly mowing and sweeping	\$10,890	0
Fertilization 3x per year	\$2,160	0
Aeration 3x per year	\$3,375	0
Natural turf renovation (biennial)	\$18,000	0
Routine irrigation inspections/repairs	\$5,200	0
Irrigation water	\$9,750	\$2,100
Weekly synthetic turf sweeping	0	\$8,250
Infill replenishment	0	\$11,250
Total Annual Maintenance Cost	\$49,375	\$21,600

Cost Benefit Analysis

10-Year Cost Analysis	Natural Turf Field	Synthetic Turf Field
Initial Installation*	\$1,200,000	\$2,768,000
Annual Maintenance x 10 Years	\$493,750	\$216,000
Total 10-Year Cost	\$1,693,750	\$2,984,000
10-Year Projected Hours of Use	19,231	24,380
10-Year Participant Hours of Use	658,586	834,900
Cost per Hour of Field Use	\$88	\$122
Cost per Participant Hour of Use	\$2.57	\$3.57

20-Year Cost Analysis	Natural Turf Field	Synthetic Turf Field
Initial Installation*	\$1,200,000	\$2,768,000
Annual Maintenance x 20 Years	\$987,500	\$432,000
Synthetic Turf Surface Replacement	0	\$1,522,400
Total 20-Year Cost	\$2,187,500	\$4,722,400
20-Year Projected Hours of Use	38,463	48,760
20-Year Participant Hours of Use	1,317,171	1,669,800
Cost per Hour of Use	\$57	\$97
Cost per Participant Hour of Use	\$1.66	\$2.83

* Initial installation estimate is total project cost, including design, environmental review, permits and fees, construction and City construction administration.