Ad Hoc Athletic Fields Advisory Committee

Report and Recommendations

October 2021

Membership

Voting Members

Town Council: Steve Boyajian (Co-chair; Turf), Jacob Brier (Finances)

School Committee: Gina Bae (Co-Chair; FUS), Anna Clancy (MA)

Municipal Volunteers: Anthony Arico (MA), David Boyes (Turf), Steve DeBoth (Finances), Bill Horn (Turf), Catherine Horn (FUS), Tom Rimoshytus (MA, Turf), Mike Seward (MA, FUS),

School District Volunteers: David Caldarella (Turf), Tess Gagliano (Turf), Ed Roskiewicz (Finances), Don Denham (Turf)

Non-Voting Members

Volunteer: Ron Pitt, Planning Board

Municipal Staff: Michele Geremia (US), John Requinha (MA)

School District Staff: Dom Denham, George Finn (FUS), Skip Learned (MA)

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Introduction

The Ad Hoc Athletic Fields Advisory Committee (AHAFAC) was formed as a joint initiative of the Barrington Town Council and Barrington School Committee in order to explore ways to improve the quality and availability of athletic fields in town for athletes of all ages.

The specific charge of the AHAFAC was two-fold

- To explore the improvement, maintenance and acquisition of athletic fields and to provide a detailed report and recommendations to the Town Council and School Committee.
- To research the cost, environmental and health impacts of artificial turf in town, and to provide a detailed report and recommendations to the Town Council and to the School Committee.

In the spring of 2019, the large committee first convened and discussed goals and objectives. Given the broad tasks, Work Groups were formed so that research and discussion could take place more efficiently. The work was divided into the categories listed on the cover page, with each of the four elected representatives focusing on a category.

The AHAFAC neared completion of its work in February 2020, when the COVID-19 pandemic delayed the final meetings at which the committee would vote on the final reports of the Work Groups and determine what recommendations would be made to the School Committee and Town Council.

On October 18, 2021, the AHAFAC reconvened to discuss and act on the final report and recommendation. The following is that report, which passed unanimously on a vote of 8-0.

Field Use and Scheduling Work Group

The Field Use and Scheduling work group conducted a survey in Fall 2019 of all recreational sports leagues in town, including Barrington Little League, St. Luke's, Barrington Youth Soccer Association, East Bay Lacrosse, and Pop Warner Football. The survey results indicated the following:

- BYSA has the most number of participants in a given season, with Little League coming in second during the Spring season.
- BYSA and Little League also require the most number of hours per week for practice/home games.
- Comments on the survey from the leagues indicated a need for better field conditions overall.

After discussion with leadership from Barrington Youth Soccer, East Bay Lacrosse, and Little League Baseball about the use of large multi-use fields in both the spring and fall, the following conclusions have been reached:

1. Large multi-use fields are the ones at a premium.

- When the Middle School fields come on-line in spring of 2022 there will be a total of 4 large multi-use fields (3 at the Middle School, and St Andrews farm field).
- The large fields currently being used by Lacrosse at Chianese were not meant to be official fields, as they have irregular surfaces and cannot be watered because of the landfill below. Therefore, they cannot be maintained to a standard safe for play.

2. The spring seems to be the time of the most demand on field space.

- Because both Soccer and Lacrosse play games on weekends with out-of-town teams, the demand for large multi-use fields on weekends is less than during the week. There is a "bottleneck" on demand for large multi-use fields on weekdays.
- Though Soccer has a large contingent of players in the spring, only those 12 and older play on a large multi-use field Monday through Thursday from 4 – 7 (April to June), so Soccer can get by with only 1 large multi-use field, while the younger kids play on smaller fields.
- Lacrosse uses 3 large multi-use fields in the spring for practices (currently using Chianese from 4:30 – 7:30 Monday through Thursday with Fridays held open for rain dates. In order to teach the game properly, a full-size field is required for grades 3 and up.
- From April to June, Little League baseball will be using the senior league field at the new Middle School for practice and games Monday thru Thursday from 5:30 – 8, and Saturday for games. This means that 1 of the large multi-use fields at the Middle School cannot be used for practice by Lacrosse as it is the outfield of the baseball field.

3. One additional large multi-use field would give all teams ample space to practice in the spring, while another additional field is needed for resting a field once every 5 years - so a total of two large multi-use fields are needed.

- Because Lacrosse needs 3 full size multi-use fields in the spring and Little League is taking up one of the 3 available at the Middle School, there is a shortage of large multi-use fields. Soccer used St. Andrews farm field in the spring.

The Work Group also explored options regarding field use scheduling as a way to create more efficiencies in scheduling field use among the town leagues.

The scheduling software question was posed to the general RI Park & Rec Association and two software options were highlighted as being used by most towns:

- **Rec Desk:** Some very positive remarks about the user-friendliness and also the ease of use by outside groups scheduling their own spaces. The local rep is Justin Waz and he is willing to meet with us. You can look at it on Pawtucket's website: https://pawtucketri.recdesk.com/Community/Home
- **Rec Pro:** Comments have been that no one uses this to allow leagues to register themselves, the rec departments take the reservations and enter them. It may be capable of self-registration, but no one is using it for that. Comments have also indicated that it does a great job tracking date, invoicing, and reporting, etc. It also works with the programming so your classes and outside rentals appear in a schedule.
- **R School Today:** We met with the representative who said that R School Today could meet our requirements of getting the league representatives involved with the scheduling input online, but specifics about that were not discussed. A price was quoted. A school version is currently being used by Athletic Director, George Finn. Cathy Larlham, the Recreation Director of South Kingstown, chose Rec Pro over R School Today because she said that "it was closer to fulfilling our needs."

Work Group Recommendations

1. Due to the shortage of large multi-use fields that will accommodate all of the groups that is in need of field use, it is recommended to find at least two additional large multi-use fields for use.
2. In order to create more efficiencies in scheduling field use among town leagues and school department, it is recommended to adopt using a scheduling software program to provide transparency and fairness in scheduling use of fields in the town. It is advisable to discuss with the school department to ensure the software program is compatible with the one they use.

Field Maintenance & Acquisition Work Group

The group began work with the understanding that the availability and condition of adequately sized playing fields in Barrington does not currently meet the needs of the many athletic groups and community members that wish to use them. The goal of this work group was to explore ways in which the maintenance of existing athletic fields can be improved, and to identify possible parcels of land within Barrington that might be developed as additional fields.

Maintenance

Maintenance of playing fields throughout the Town, both at the schools and on municipal lands, is the responsibility of the Department of Public Works. It is generally agreed that this arrangement serves the Town well, from a fiscal perspective. However, as it exists, there is no system in place to precisely track the time and materials used for field upkeep, nor is there a way to identify definitively how much time and materials are used to service municipal fields vs. school fields. While this practice allows for "fluid" scheduling, and often results in more efficient use of resources, it would be helpful for planning and assessment purposes to develop a method to begin to track the use of these DPW resources.

In general, community satisfaction with the condition of the majority of available fields appears to be reasonable, though enhancements such as dugout covers, access to restrooms, lighting, etc. are desired.

It is the conclusion of this work group that there are two primary obstacles that keep existing fields in Barrington from being maintained in the best possible condition:

1. A shortage of Department of Public Works (DPW) personnel

Currently, DPW is understaffed to adequately meet the needs of the Town as a whole (infrastructure, tree maintenance, school grounds upkeep, equipment maintenance, athletic field upkeep, Parks & Recreation events, etc.). Not infrequently, a choice must be made between competing demands.

Since 2010, when trash collection services were outsourced by the Town, the Department of Public Works has lost a net of 2 employees. At the same time, mandates and standards from agencies such as the Department of Environmental Management (DEM) and the Occupational Safety and Health Administration (OSHA) have increased, adding significantly to the work of the DPW. In the words of John Renquinha, the Superintendent of Public Works, he is "running a triage center, not a department of public works." Based on its review of available information and the recommendation of Mr. Renquinha, it is the conclusion of this work group that, in order to achieve and maintain the best possible municipal and school athletic fields, the Town should add four full-time employees to the Department of Public Works, a request the department has made for a number of years. Given the voters' approval of two additional DPW employees at the July 18, 2020 Financial Town Meeting, we are recommending that the Town continue to plan for at least two additional DPW personnel as soon as possible.

2) The inability to "rest" fields

Due to the limited availability of field space throughout Town, it is almost impossible to take any fields "offline" for a sufficient amount of time to allow for optimal recovery and regrowth. It is accepted practice that this should be done on a rotating basis, and with a consistent and comprehensive plan. Despite the imminent return of field space at the Middle School, current field demand means that the ability to rest fields as required will not improve without the addition of new fields

Acquisition and Development

Demand for and an insufficient number of full-sized athletic fields in Town indicate a need for acquisition or development of additional lands. This is not a new problem – it has been documented since at least 1986 when it was examined by the Park and Recreation Commission. After consultation with the existing Parks & Recreation Department and the Scheduling work group of the Ad Hoc Athletic Field Advisory Committee, it was determined that one additional full-size field (comparable to a girls' lacrosse field, approximately 110 yards x 60 yards) would meet the Town's needs, and an additional full-sized field would be necessary for resting purposes.

Today's work group began its study of potential locations for development of new field space with a broad perspective. Among possible sites and associated drawbacks that the work group explored were:

- **Tall Cedars Conservation Land**, currently owned by the Town of Barrington – This 32-acre, wooded area, bounded by house lots on Hunt Drive, Crown Avenue, Washington Road, Rosedale Avenue, and land owned by the Barrington Land Conservation Trust, is 100% wooded and essentially land-locked. It does not represent a suitable opportunity for development.
- **Rear of Primrose Hill School lot** – This portion of the land owned by the Town on which Primrose Hill School sits abuts property at the intersection of County Road and Old County Road currently owned by the State of Rhode Island and occupied by the East Bay Mental Health Center. According to the Town Planner, this is the only parcel of undeveloped land, owned privately or by the Town, that is large enough for development as playing fields. However, the contours of this portion of the site are too steep to permit development without prohibitive re-grading.
- **George Street land**, currently owned by the Town and designated for use as a future cemetery. While this property is not wooded and is relatively flat, it is a waterfront lot subject to DEM restrictions regarding setbacks, etc. In conjunction with the limits of abutting lots at the street-side, and the distance from the center of Town, the usable space at this site is too small to make sense for development.
- **Zion Bible Institute site** – Much of this approximately 13.5-acre site is wet, and it contains numerous buildings with environmental issues. While the current ownership situation is such that this site is not available to the Town, it is the work group's recommendation that it be watched carefully for future opportunities.

Given the substantial limitations associated with many potential sites, this work group chose to focus on a full exploration of possible expansion opportunities at Haines State Park, where some infrastructure (access, parking) already exists. If planned and executed correctly, this development could be achieved at reasonable cost and without significant impact to surrounding properties.

The first step in any development of additional, improved field space at Haines State Park would be to negotiate a long-term lease with the State of Rhode Island, the owner of this park land. Currently, the Town of Barrington leases and maintains that portion of the Park bordered by Narragansett Avenue, Haines Park Drive, Washington Road, and the ends of various streets to the south. In addition to wooded areas, there are presently two parking areas, a dog park, a brook, two baseball and a softball diamond, and two open field areas in the portion of the Park maintained by the Town. Only with a long-term lease would further development of these features be justified.

In order to move forward in negotiations with the State for a lease that would allow for the envisioned improvements, it is necessary to develop conceptual drawings and a bid package. Conceptual drawings have been obtained and are attached to this report, though they may require refinement before proceeding to develop a bid package. A rough estimate of the cost to prepare all necessary materials is between $50,000 and $75,000. When fully developed, these plans would show the two options this work group has considered:

- Option A: Development of a new, full-sized field at the open space abutting Washington Road and Haines Park Drive. This would entail clearing of trees at the eastern and southern edges of this open space, as well as relatively more excavation than the second option.
- Option B: Development of a new, full-sized field at the current site of a baseball diamond known as Harrington Field. Such development would require moving this existing field, which is due for re-construction.

The attached plans show these two possible configurations. (Appendices A. & B.)

It is the recommendation of this work group that the Town proceed with investigation of “Option B” first but consider undertaking both options simultaneously, particularly if any grant funding might be available. This would provide the two full-sized fields recommended by the Scheduling work group. An integral part of any development work must be one or more irrigation system(s). Without proper irrigation, the potential for good field condition in both the short and long-term is not good.

Work Group Recommendations

1. Continue to pursue accurate tracking of DPW manpower to support advocacy for additional personnel qualified to properly and sufficiently maintain municipal and school sports fields.

2. Develop and firmly impose a rotating schedule to allow fields to “rest”.

3. Promptly engage in negotiations with the State Department of Environmental Management to obtain a long-term lease for Haines State Park with appropriate permissions for development. At the same time,

4. Engage a professional firm to develop final plans and a full bid package for agreed-upon enhancements at Haines State Park.

5. Engage with Haines State Park neighbors throughout the plan development process to ensure understanding and support.

*See Appendix C for updated information

Artificial Turf Work Group

One half of the charge of the Ad Hoc Athletic Field Advisory Committee was “To research the cost, environmental and health impacts of artificial turf field and to provide a detailed report and recommendations to the Town Council and to the School Committee and to conclude their business in one year.”

This portion of the Committee’s charge was undertaken by a subcommittee (the “Subcommittee”) consisting of Anthony Arico, Steven Boyajian, David Boyes, David Caldarella, Donald Denham, Bill Horn, Catherine Horn, TR Rimoshytus and through frequent consultation with George Finn.

In order to undertake an evaluation of these issues, and the potential community benefits to be derived from an artificial playing surface, the Subcommittee had to first devise a conceptual plan for an artificial turf field. This involved selection of a potential location, determination of approximate size in light of sports schedules, desired uses, and consideration of neighborhood impacts and convenience associated with any location selected. The Subcommittee remained mindful of the events leading up to the formation of the larger Committee—the unavailability and deteriorating condition of youth league recreational fields due to high demand, insufficiency of space and inclement weather. Based upon these factors, the Subcommittee determined that the best location for an artificial turf playing surface would be on the east side of the Barrington High School campus on the fields running from Federal Road to Lincoln Avenue along County Road.

Summary of Subcommittee Findings

Having made that initial determination regarding the location and scale of an artificial turf surface, the Subcommittee set out to evaluate, and if possible allay, concerns that had been raised in prior community discussions regarding artificial turf:

1. **Health and Safety** – including considerations of injury risks, exposure risks, heat, abrasions, infections and concussions;
2. **Environmental** – including considerations of runoff, pollution and recyclability; and
3. **Cost** – including considerations of installation/construction costs, periodic surface replacement and regular maintenance.

The Subcommittee’s brief findings on these topics are as follows:

1. **Health and Safety**

    a. Some studies suggest that the incidence of non-contact extremity and torso injuries is significantly higher (by as much as 58% among high school athletes) on artificial turf as compared to natural turf while other studies suggest that there is little difference in the risk of injury. Most available studies admit of substantial uncertainty due to the impracticability of controlling for a large number of variables such as the footwear worn by the athletes, the level of play, the particular sport being played, the failure to properly maintain the studied artificial fields and the condition of the natural playing surfaces considered in the

statistical comparison. Risks of injury can be mitigated by ensuring regular maintenance of artificial surfaces through regular infill and fiber replenishment and grooming and through the use of proper footwear.

b. The regularly raised concern of exposure to artificial turf causing cancer or other diseases is seemingly unsubstantiated as there is no study establishing a significant link between play on artificial surfaces and disease. However, there are no reliable studies offering a full risk assessment of exposure to recycled tire crumb rubber, a commonly used infill, and the Environmental Protection Agency has identified a number of carcinogens and other undesirable chemicals in crumb rubber derived from used tires. The EPA's ongoing study of artificial turf will not include an assessment of the risks to human health from the presence of these chemicals in recycled tire infill and no risk assessment appears likely to be produced by a reliable source in the near term.

   For this reason, the Subcommittee recommends that the Town simply avoid the use of recycled tire crumb rubber and instead opt for an alternative infill such as coated sand in combination with natural (or virgin) rubber or one of the several organic infills available in the marketplace. The characteristics of these alternative infills, including some materials as innocuous as cork, wood or coconut fiber, raise little concern.

c. Given the Town's climate heat issues are of somewhat less concern here than in other parts of the country. However, even in Connecticut athletic directors have had to monitor field temperatures and move events or schedule around the hottest periods of the day. Depending upon the materials used, artificial turf surfaces can become extremely hot during midday in hot weather with surface temperatures at Brigham Young University reaching as high at 200 degrees Fahrenheit and up to 160 degrees at waist height during days with ambient temperatures that regularly occur in Barrington.

   The use of organic infills that hold moisture can significantly reduce this heating effect through evaporation and lead to artificial field temperatures close to those observed on natural grass fields. This would require some means of regular irrigation during dry periods which is advisable in any event in order to wash away surface contaminants, prevent the static cling of infill to the field fibers and to maintain good field appearance. The use of moisture holding infill can have certain performance drawbacks in that the infill can freeze in much the same way as a natural field.

   The Town should be prepared to occasionally stay off of any artificial turf field during midday in warmer months (such as pre-season practices in August or late spring season events in June) to avoid dehydration, heat stroke and similar risks, but the same heating that is undesirable in warmer months could be a benefit for cold season outdoor athletics where cold and frozen ground present an increased risk of player injury.

d. There are few available studies of abrasion risks associated with artificial turf, and those that are available have often considered earlier generation nylon field materials that are largely obsolete. “Turf burns,” cause by sliding across the field fibers, and similar injuries are widely reported, but it is unclear whether these types of injuries are any more prevalent on latest generation artificial turf fields when compared to natural fields of less than optimal quality. These types of risks can be mitigated, though not eliminated, through ordinary precautions such as the use of proper footwear to avoid slipping and regular maintenance of the field to evenly distribute infill. Infill selection can also have an impact on abrasion risks as certain infills (such as silica sand, walnut shells and coconut fibers) are abrasives that are used in other contexts for sandblasting.

e. Concerns about infection of abrasions and lacerations through contact with contaminated artificial playing fields are sometimes sensationalized with references to MRSA and other dangerous microorganisms. While improperly maintained *indoor* artificial turf surfaces might present such risks, available studies suggest that the presence of microorganisms on outdoor artificial playing surfaces is really no different than observed on natural grass.

   While there is no need for regular wholesale disinfecting of artificial playing surfaces, occasional spot disinfecting of food and beverage spills and bodily fluids is recommended as part of a normal maintenance program.

f. Concussion risks that are often raised are largely the result of inferior materials, design and installation of earlier generation turf fields. Latest generation turf fields are regularly subjected to tests and, when properly designed and maintained, can outperform even good quality natural surfaces in this regard. Ensuring the safety of field users comes at a cost in the form of more expensive materials, the use of a subsurface shock pad and the regular redistribution of infill, but these measures are all well within industry standards at this time and are desirable in any event in order to enhance the performance characteristics of an artificial field.

2. **Environmental**

a. Infill materials are the most cited root of environmental concerns associated with artificial athletic fields. As noted above, one of the most commonly used infills consists of used tires ground into small crumbs. The EPA has performed detailed testing of used tire crumb rubber which identified a number of carcinogens and other undesirable or dangerous substances. Some studies have identified risks of ground and surface water contamination from such materials. Rather than try to form some conclusion based upon the various studies, the Subcommittee recommends avoiding these concerns entirely by using one of the widely available alternative infills available in the market. There is simply no reason to risk serious health and environmental consequences by spreading ground up tires over acres of Barrington when alternative materials exist.

b. The fiber carpet that is the “grass” of an artificial field typically consists of woven or tufted polypropylene[1]. Recently concerns have been raised about the presence of per- and polyfluoroalkyl substances (or PFAS) in artificial turf fibers. These chemicals, sometimes known as forever chemicals due to their slow rate of dissipation in the environment, are becoming better understood and seemingly present significant human health risks. PFAS does not appear to be an actual constituent part of the fiber material. Rather, it is essentially used as an industrial lubricant to assist in the smooth extrusion of plastics, potentially including the polypropylene fibers from which the turf carpet is made. A number of manufacturers of turf carpet have publicly stated that they do not use PFAS in their manufacturing process and these statements would be verifiable through available independent testing at a reasonable cost. For this reason, the Subcommittee recommends that the Town source field carpet from a manufacturer that does not use PFAS in its manufacturing and that the Town commission an independent material analysis to confirm the manufacturer’s claims as part of any purchasing decision.

c. Some have questioned whether the components of an artificial turf field can be recycled. Whether the carpet is recyclable depends upon the particular product selected. Tufted polypropylene carpet is held together through the use of a urethan adhesive painted on the backing which renders it non-recyclable through any reasonable means. However, woven carpet does not require the use of a urethane to hold the material together and is capable of being recycled. It is also reported to be more durable and to perform somewhat better than non-recyclable tufted materials. According to industry sources, there is a facility in Europe that is able to recycle the material, but it is not presently accepting used fields for recycling. Whether the field carpet would be recyclable in ten years, its assumed useful life, is unknown due to the recycling market, but the material is capable of being recycled with existing technology.

As for the field infill, certain synthetic infills are able to be reclaimed and reused as part of the field surface replacement process. Certain organic infills may degrade to the point that they are not reclaimable or reusable. These organic infills can be easily and safely disposed of as compost or topdressing.

[1] Polypropelene is widely used in everything from clothing to household carpeting and food and beverage containers. While certain studies have identified health risks from some polypropylene products, it is widely understood that the risks arise from inferior manufacturing processes and byproducts rather than the plastic material itself. While people may disagree about the extent to which the use of plastics should be avoided for any number of reasons, there is no reliable information to suggest that the common uses of polypropylene are directly threatening to human health.

3. **Cost**

a. As conceived, the installed cost of the proposed artificial turf surface is estimated to be approximately $3-$4 million based upon a per square foot estimate of $10 and the assumption that the Town would adopt the Subcommittee's recommendation to use high quality alternative infill and woven carpet. The use of materials of lesser quality could reduce this initial cost somewhat, but those savings would come at the expense of peace of mind concerning the safety of the infill, the recyclability and quality of the carpet, the presence of an under-surface pad to minimize concussion risks and other inadvisable compromises. Aside from material selection, the major driver of the cost variation is whether the Town opts to include the so-called Library Field (in the southeast corner of the High School campus) within the scope of work.

   This estimated cost does not include lighting which would be necessary to realize the real benefit of an artificial turf field—near constant use without deterioration. The estimated cost of lighting is too uncertain to be reliable until the fields are fully designed since orientation of baseball diamonds and other fields would dictate a lighting design. Approximations of $80-100/light pole were offered for the sake of discussion by people familiar with the industry.

   Site/drainage work and player and spectator amenities would likely be able to be completed within this estimated cost, but that would remain uncertain until site assessment and adoption of a final design and testing market conditions through the bidding process. The Subcommittee was informed by people with industry experience that project timing can have a material impact on bids.

b. Artificial turf fields require surface and infill replacement on a periodic basis assumed to be every ten years based upon industry sources and first-hand experiences of recreation and athletic directors locally. The Subcommittee was advised that it would be prudent to assume that replacement would cost approximately fifty percent (50%) of initial project cost (exclusive of lighting and durable amenities). Given that, the Subcommittee assumes that the Town would need to reserve $150,000 to $200,000 annually in a dedicated capital account to fund future replacements without incurring debt. While it is possible that a field could outlive this ten-year period, deferred maintenance could render the field less safe.

   While there are many news reports of premature field failures and misleading marketing, these appear to be well publicized bad news stories that are the exception rather than the rule. Local recreation and athletic directors have generally reported high satisfaction with their artificial field durability and performance in line with what was expected at the time of installation. For example, a local news report concerning an artificial turf field at the Andrew J. Tucker athletic complex in Cumberland, Rhode Island seemed to suggest

through its tone that the deterioration of the playing surface installed was surprising. Despite the tone of the news report, the recreation director reported in discussions that the field has performed very well and in accordance with expectations at the time of installation and that the wear and tear experienced in the years following installation was ordinary and manageable.

c. Aside from periodic surface replacement, the regular maintenance costs of an artificial turf field are reasonable and not cause for concern. For a modest fee, Towns can contract with maintenance companies to perform periodic sweeps of the field to remove any stray metallic objects and to pay particularized attention to worn areas, staining and other issues. Aside from that periodic maintenance, the Town would need to purchase some relatively inexpensive grooming equipment to perform its own field grooming to redistribute infill and fluff the synthetic grass blades. The frequency of this maintenance depends upon field use and is similar to mowing of a grass field.

   While ordinary maintenance costs of an artificial turf field are predictable and relatively modest, it is important to take measures to protect the field from damage from vandalism, misuse, etc. as the failure to do so could lead to expensive repairs.

Discussion of Artificial Turf Benefits and Uses

While not explicitly within the Committee's charge[2], the Subcommittee believed it important to evaluate and articulate the benefits offered by an artificial turf playing field: (1) to understand whether the installation of an artificial playing surface would actually alleviate some of the field condition and access problems that precipitated the Committee's formation; and (2) in order for the community to understand why such a significant investment of public funds would be proposed. It was this evaluation of the attributes of artificial turf that led to the selection of the proposed location for the proposed artificial playing surface that some might find surprising—a significant portion of the High School campus without including Victory Field.

First, artificial turf playing surfaces can accommodate near constant use without significant degradation in quality. While increased use will cause an artificial turf surface to degrade more quickly, if properly maintained and protected from damage, the degradation is more in the nature of wear and tear that would be expected of an ordinary carpet than the type of damage that prevents use of natural grass fields for weeks or months of renovation and rehabilitation. Some industry literature will tout playing times that are simply unrealistic in light of the fact that youth athletes attend school during the day, and the fact that many youth coaches cannot organize practice during work hours. Despite certain exaggeration in industry literature,

[2] Through discussion, the Subcommittee came to recognize that its charge was focused exclusively on the study of risks associated with artificial turf without consideration of whether there were also benefits.

the Subcommittee assumes that thoughtful scheduling would allow for near constant use of an artificial turf field from 3:00 P.M. until 9:00 P.M. on weekdays by high school athletes and youth leagues and another hour of play by adult recreational leagues. On weekends, the surface would be playable from 8:00 A.M. (the earliest that any major youth league organizes events) until 10:00 P.M at which time the Subcommittee assumes that field lights would need to be shut down out of consideration for neighbors. This is 58 hours of playing time per available field as compared to the 20-25 hours of playing time that is a standard recommendation for natural grass fields in order to maintain quality

Second, provided that suitable drainage is engineered into an artificial field system, it is available for use in any weather conditions in which one can imagine youth athletes being willing to play. While certain sports, such as baseball and softball, become unplayable in rain due more to the safety issues associated with a wet ball than field conditions, other sports events in Barrington are cancelled for weather solely because of the damages that would result to the fields while they are wet. The use of an artificial turf field in inclement weather does not present any risk of damage to the playing surface, and even if youth athletes are unwilling to play through the weather, it will be available for use immediately after inclement weather has passed whereas drainage issues at many of Barrington's natural grass fields can mean that they are unplayable for a day or more after wet weather has passed. It is important to note that artificial playing surfaces in wet weather are only as good as the drainage system installed underneath them. In 2010, East Greenwich became embroiled in a dispute with the manufacturer, installer and engineer involved with the installation of brand new artificial turf field. The field flooded in rain events with a little as 0.5" of precipitation. East Greenwich's study of the problem at the time indicated that the material used under the field for drainage was too fine and not as deep as specified in the approved plans. The resolution of the issue required significant repairs and East Greenwich teams were kept off of the field, even in dry conditions, until a resolution was reached because use of the field would have been deemed acceptance of it.

Third, absent extraordinary investment of time and money and frequent field closures for resting of grass, artificial turf offers consistency of field quality throughout the year that is not possible to achieve through the use of natural turf in Barrington due to climate, soil conditions, Canada geese and frequency of field use.

Location of Artificial Turf Field

In order to permit analysis of the costs and benefits of an artificial turf playing surface in Barrington, the Committee first needed to develop a project in concept both to quantify the costs and measure the benefits associated with a field. For example, artificial turf would not offer the benefit of avoiding the cancellation of youth sports league events for weather if the field could not accommodate youth leagues (due, for example, to schedule conflicts or physical dimensions of the field). Similarly, an artificial turf field would not offer the benefit of near constant use unless it was lighted or the benefit of low maintenance if it was surrounded by trees necessitating the removal of leaf litter or in a location that could render it susceptible to damage from vandalism or unsupervised misuse.

For a number of reasons, the Subcommittee determined that the High School was the appropriate location for an artificial turf field if constructed. First, it is largely enclosed by a fence in a high visibility area which would lower the risk of damage from misuse or vandalism. Second, the High School already offers ample parking while many other public open spaces do not. Third, the selected area has very few nearby trees that would contribute to leaf litter requiring cleanup. Fourth, location at the High School would maximize the use of the field due to the fact that, on weekdays, High School athletic practices begin near the end of school and end near the time that youth leagues begin their evening practices. Fifth, the High School fields are largely unused during weekends when cancellation of youth sports events tends to impact games, as opposed to practices. Finally, the High School offers the most feasible opportunity for the installation of field lighting that is necessary to realize one of the major benefits of artificial turf—the capacity to support near constant use with minimal surface degradation.

Other potential locations were considered, but deemed inferior to the High School. Chianese Park is in adjacent to approximately 20 residences and has insufficient parking to accommodate the number of sporting events taking place on existing facilities located there. It is assumed that additional events and field lighting would be unacceptable to nearby residents. Additionally, the presence of a capped landfill on site would likely add significant additional cost to any changes on the site that would not arise if an artificial turf field were constructed at the High School. Despite the recent execution of a long term lease for portions of Haines Park, it too has insufficient parking for existing events. Also, it may be inadvisable to make the significant investments required to install lighting and artificial turf (even if the Department of Environmental Management were to approve) in a leased property. McCulloch Field at St. Andrews Farm has dimensional constraints that would render it of limited utility for school athletes and youth leagues. Barrington Middle School held promise in that it has significant parking and few abutters that would be affected by field lighting. However, the Middle School Building Committee rejected a proposal to locate an artificial turf field there and the existing grass fields only recently opened after significant controversy and delay.

Within the High School campus, the selection of a specific location for an artificial turf field is complicated by the configuration of existing facilities. Victory Field initially seemed a common-sense location for an artificial turf field if constructed given its prominence on the High School campus, existing lighting, and its use for major events. However, in order to actually satisfy the community's desire for a durable playing surface that could accommodate youth sports leagues in periods of inclement weather/substandard grass field conditions, an artificial surface within the confines of Victory Field is of limited benefit due to the need to fit the field within a track of acceptable dimensions.

The existing distance between the two straightaways of the High School track is approximately 180’ or 60 yards. A standard U9 lacrosse field and U12 soccer field are both 240’ or 80 yards long and those lengths increase as child athletes age. Given these field dimensions, Victory Field could not accommodate more than one lacrosse field for players older than 9 or soccer players older than 12. In the event of inclement weather resulting in field closures, dozens of youth teams over these ages face cancellations, and the availability of a single field (to the extent it is not already occupied by a High School team) offers virtually no help in those circumstances. While an artificial turf Victory Field might help to accommodate more High School games and practices, because of the increased capacity for use without damage, it would not provide a viable alternative to grass fields for youth teams because the High School practice fields that might become available due to the increased use of Victory Field by High School athletes would presumably be subject to the same weather related field closures as all other grass fields in the Town.

Additionally, the installation of an artificial turf field at Victory Field entails significant non-field related costs as illustrated by a 2014 study in connection with a prior proposal to install artificial turf at Victory Field. These costs included the cost of bleacher changes, concession stand and press box changes, lighting relocation, track changes and potential relocation of the Junior Varsity baseball field. In combination, these changes might improve the functionality of Victory Field, but without any tangible benefit to the youth sports league athletes that suffer the brunt of the Town’s athletic field limitations.

In contrast to Victory Field, and the associated constraints presented by existing infrastructure, the High School fields adjacent to County Road offer a relatively clean slate and can accommodate a large number of youth sports fields. Depending upon configuration of the

fields, the High School fields adjacent to County Road (if the Library Field were included) could accommodate as many as six U12 soccer fields. The impediments to this flexibility are the existing Varsity and Junior Varsity baseball diamonds which present two main issues: (1) the infield dirt and pitchers' mounds; and (2) the fact that other sports cannot be safely played in close proximity to an in-use baseball field. The first of these issues might be addressed by reconfiguration of the baseball diamonds.

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It is possible that these issues could be mitigated, but not eliminated. While the Varsity baseball diamond is properly oriented to have the batter face to the northeast, the Junior Varsity field is improperly oriented such that the batter faces to the southeast. It might be possible to relocate the Varsity baseball diamond toward the southwest corner of the Library Field with the field oriented towards the northeast and to move the Junior Varsity field to the south and reorient it to face northeast as well. This would minimize the interference of the infield dirt and pitchers' mounds with the remainder of the available open space at the subject site—especially near the intersection of County and Federal Roads. However, this field relocation would require the installation of protective fences or netting to prevent foul balls from landing in the yards of campus neighbors to the south of the library field. A further potential measure to maximize the area of multiuse artificial turf playing surface would be to convert the reoriented baseball diamonds to full turf fields that feature moveable pitchers' mounds and all turf infields, i.e. without dirt. This significant change to the baseball facilities would need to be closely examined

after consultation with field designers, the School Department's athletic director and the baseball coaching staff and players.

The second issue, the danger presented by long hits, would need to be resolved through scheduling more than physical changes to the fields since any fences erected to mitigate the dangers of long hits would interfere with the flexibility of a multiuse artificial turf field. At the high school level, it should be assumed that players will hit the ball 300' with considerable frequency, with a significant potential for 400' hits and, somewhat famously, fluke hits exceeding 500'.[3] Any risk of a long hit reaching a youth league player concentrating on their own sporting event is unacceptable such that the Committee assumes that ongoing baseball games would largely preclude the use of any significant portion of the field space adjacent to County Road. This is a significant impediment to field use in light of the fact that the peak hours of field demand by youth sports leagues, weekday afternoons/evenings in the spring, coincide with the high school baseball season. Notwithstanding this issue, the Committee was informed by the High School's athletic director that multiuse artificial turf field adjacent to County Road would be available for wider community use almost every weekday from 6:00 PM on and almost the entirety of every weekend.

Given the number of youth fields that could fit on the proposed multiuse artificial turf field, it is reasonable to anticipate that a nearly complete schedule of weekend games could be accommodated on the field even when every natural playing field was closed. Doing so would, however, would potentially require flexibility on the part of leagues, parents, coaches and athletes to scheduled games at times different from a typical schedule.

Proposal Cost

As conceived, the installed cost of artificial turf over the entirety of the High School field adjacent to County Road would be *approximately* $10 per square foot. This price does not include field lighting. Given the square footage of the area—approximately 380,000 square feet—the initial project cost is estimated to be $3.8 million. This estimate assumes selection of premium infill and carpet to meet the Committee's objective of resolving as many environmental and health concerns as possible. At this stage, formulation of a more precise estimate would not be sensible given that design details, spectator and player amenities, detailed drainage assessments and related diligence would need to be completed at significant cost before a bid package could be finalized.

At the time estimates were obtained from industry sources for turf installation, the cost of lighting was too uncertain to be estimated reliably. Lighting of the area would require detailed designs, electrical system assessments and abutter input. It is assumed that the cost of lighting would add several hundred thousand dollars to the project cost. Field lighting would, however, be essential to achieve the objectives of artificial turf field installation given that weeknight field

[3] As a high school player, Bryce Harper is reported to have hit a home run unofficially measured at 570'. For context, this would be equivalent to hitting a ball from home plate on the Varsity baseball field to the front steps of the White Church.

availability would begin at 6:00 PM (after High School athletic practices) and in several months of the year there would not be sufficient daylight to accommodate youth practices after that time.

On the assumption that the Town would issue a bond to pay for initial construction, the finance director prepared debt service forecasts for a $3 million, $3.5 million and $4 million bond as follows.

BOND DEBT SERVICE

Town of Barrington, Rhode Island
Proposed General Obligation Bonds
Estimated Rate 1.95% (Current Market Plus .50%)
10-Year Term
Assumes February 1, 2022 Delivery Date

Period Ending	Principal	Coupon	Interest	Debt Service
06/30/2023	275,000	1.950%	58,500.00	333,500.00
06/30/2024	280,000	1.950%	53,137.50	333,137.50
06/30/2025	285,000	1.950%	47,677.50	332,677.50
06/30/2026	290,000	1.950%	42,120.00	332,120.00
06/30/2027	295,000	1.950%	36,465.00	331,465.00
06/30/2028	305,000	1.950%	30,712.50	335,712.50
06/30/2029	310,000	1.950%	24,765.00	334,765.00
06/30/2030	315,000	1.950%	18,720.00	333,720.00
06/30/2031	320,000	1.950%	12,577.50	332,577.50
06/30/2032	325,000	1.950%	6,337.50	331,337.50
	3,000,000		331,012.50	3,331,012.50

Town of Barrington, Rhode Island
Proposed General Obligation Bonds
Estimated Rate 1.95% (Current Market Plus .50%)
10-Year Term
Assumes February 1, 2022 Delivery Date

Period Ending	Principal	Coupon	Interest	Debt Service
06/30/2023	320,000	1.950%	68,250.00	388,250.00
06/30/2024	325,000	1.950%	62,010.00	387,010.00
06/30/2025	335,000	1.950%	55,672.50	390,672.50
06/30/2026	340,000	1.950%	49,140.00	389,140.00
06/30/2027	345,000	1.950%	42,510.00	387,510.00
06/30/2028	355,000	1.950%	35,782.50	390,782.50
06/30/2029	360,000	1.950%	28,860.00	388,860.00
06/30/2030	365,000	1.950%	21,840.00	386,840.00
06/30/2031	375,000	1.950%	14,722.50	389,722.50
06/30/2032	380,000	1.950%	7,410.00	387,410.00
	3,500,000		386,197.50	3,886,197.50

Town of Barrington, Rhode Island
Proposed General Obligation Bonds
Estimated Rate 1.95% (Current Market Plus .50%)
10-Year Term
Assumes February 1, 2022 Delivery Date

Period Ending	Principal	Coupon	Interest	Debt Service
06/30/2023	365,000	1.950%	78,000.00	443,000.00
06/30/2024	375,000	1.950%	70,882.50	445,882.50
06/30/2025	380,000	1.950%	63,570.00	443,570.00
06/30/2026	390,000	1.950%	56,160.00	446,160.00
06/30/2027	395,000	1.950%	48,555.00	443,555.00
06/30/2028	405,000	1.950%	40,852.50	445,852.50
06/30/2029	410,000	1.950%	32,955.00	442,955.00
06/30/2030	420,000	1.950%	24,960.00	444,960.00
06/30/2031	425,000	1.950%	16,770.00	441,770.00
06/30/2032	435,000	1.950%	8,482.50	443,482.50
	4,000,000		441,187.50	4,441,187.50

The regular maintenance cost that the Town would incur, barring any unforeseen extraordinary damage, is relatively modest. As explained above regular maintenance of the proposed artificial turf field would consist of simple grooming (akin to mowing a grass field) with a tractor and sweeper. The equipment required to do this is not a significant expense (approximately $5,000-$10,000) assuming that the Town owns a suitable tractor to pull a groomer. In addition, it is assumed that the Town would enter into a maintenance contract at a modest cost (approximately $10,000 per year) for more involved semi-annual maintenance including magnetic sweeping to remove any stray metal objects, cleaning of any extraordinary spills and replenishment of infill in high traffic areas.

The Town should also plan to contribute $190,000 per year to a dedicated capital account in order to fund full surface replacement (estimated to cost approximately 50% of the initial installation) every ten years.

In light of these projected costs, the total annual cost of installation, maintenance and replacement of the proposed artificial turf field would be approximately $650,000 per year for the first ten years following installation and between $150,000 and $200,000 per year thereafter.

In order to raise this revenue, the tax rate would need to be increased by approximately $.20 per thousand dollars of assessed value for the first ten years following installation—an effective tax increase of slightly over 1%. For the owner of a $500,000 home (the current median assessment of residences in Barrington is $499,000), the household would see an annual tax increase of $100 per year for ten years. Following repayment of the bond for initial construction costs, the annual cost for the owner of a $500,000 property would be approximately $30 per year to fund a surface replacement capital account.

Health and Safety

The health and safety risks associated with artificial turf were studied with an eye toward reducing the uncertainty that results from widely reported conflicting information. Press reports, government and academic studies have focused on several issues in particular: potential

toxicity of infill materials, concussion risks, abrasion/infection risks and non-contact injuries to extremities.

Toxicity of Infill

Perhaps the most prominently reported concern about artificial turf is the potential link to cancer. To be clear, there are no definitive studies establishing a link between artificial turf fields as a general matter and cancer. The concerns in this regard focus on infill materials used and, in particular recycled tire crumb rubber also known as Styrene Butadiene Rubber or SBR. This material consists of rubber particles derived from the grinding of used tires.

Given public questions about the safety of tire crumb rubber, in February 2016, Environmental Protection Agency (EPA), the Centers for Disease Control and Prevention-Agency for Toxic Substances and Disease Registry (CDC/ATSDR), and the Consumer Product Safety Commission (CPSC) launched the Federal Research Action Plan (FRAP) on Recycled Tire Crumb Used on Playing Fields and Playgrounds. The federal research is structured as a four-part study structured as follows:

EPA United States Environmental Protection Agency

Refresh iManage View

Status of Research Activities

ATSDR AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Research Activity	Lead(s)	Status
Literature review and data gaps analysis	EPA ORD, CDC/ATSDR & CPSC	Completed; released with Status Report, December 2016*
Collect Tire Crumb Samples from manufacturing facilities (recycling plants) and synthetic turf fields Tire Crumb Characterization: Chemical constituents; Particle size; Microbes; Emissions; Bioaccessibility	EPA ORD and CDC/ATSDR	Completed; draft report peer reviewed; Part 1 report released to public
Exposure Characterization: How people are exposed based on activities on the fields	EPA ORD and CDC/ATSDR	Completed and draft report peer reviewed; Part 2 of report will be released at a later date along with the CDC/ATSDR biomonitoring study results
Biomonitoring Study	CDC/ATSDR	Institutional Review Board (IRB) approval received; awaiting final Office of Management and Budget (OMB) approval of the Information Collection Request (ICR)
Playground Study	CPSC	Telephone survey complete; results will be in a future separate report

*other items in Status Report include an industry overview and summary of stakeholder outreach

The EPA's Part 1 characterization study of SBR at athletic fields, and in the recycling plants where it is processed into crumb rubber infill, indicated the presence of a number of substances of concern including heavy metals and volatile organic compounds that are known to present risks to human health. In particular, the EPA's characterization study noted the presence of cadmium, benzene, nickel, chromium, and arsenic which are known carcinogens. However, the study also noted that these materials had relatively low bioavailability in the form of artificial field infill. This was determined by attempting to dissolve infill material in simulated bodily fluids (saliva, sweat and gastric fluids) and then measuring the concentration of materials of concern in those fluids.

Ultimately, while the EPA's ongoing study of SBR infill was of interest to the Committee, it is of limited utility. The EPA has stated that its study will not include a risk analysis. In other words, even when the EPA's study has concluded it will not offer any conclusions as to whether SBR crumb rubber presents a risk to human health through the exposure that could be expected on an artificial turf field.

It is the Committee's belief that trying to reach conclusions that even the EPA and CDC are unwilling to offer is a futile and risky undertaking especially given the known presence of carcinogens in the materials in question. On that basis, the Committee believes that the question should be avoided entirely by using one of many available alternative infills. These alternatives carry additional cost, and in some cases offer less real-world experience to fully understand future performance characteristics of certain products through their lifecycle. However, given the nature of the issue, it is not sensible to use an SBR infill.

Some example of alternative infills are:

1. **Virgin EPDM Rubber**

This appears to be a more stable relatively inert product with very low heavy metal and poly-aromatic hydrocarbon (PAH) test results. Other physical properties are similar to those of crumb rubber, resulting in thermal concerns during hot weather but likely less "off-gassing" of volatile organic compound.

2. **Thermo Plastic Elastomer (TPE)**

TPEs do not appear to present the same environmental issues as Virgin EPDM rubber or crumb rubber. TPEs are relatively inert plastics that are currently used in medical devices, children's toys and various household items. This product can be recycled for re-use in other products or re-use as infill. However, considering recent emerging contaminant investigations associated with turf fiber production (detailed below), it would be reasonable to suggest further investigation of TPEs use since TPE is subjected to similar malleability and extrusion processes as turf fiber.

3. **Organic/Natural Infills**

Currently there are several products that fall into this category: granulated cork, corconut (a blend of cork and coconut husks), granulated walnut shells, and engineered wood particles

(such as a product called BrockFill). All these products eliminate the chemical hazard concerns of crumb rubber, Virgin EPDM rubber and TPEs and provide for cooler playing surfaces. Furthermore, at the end of their usable life expectancy (8-12 years), they can be recycled as soil amendments. However, watering and replenishment have been shown to be necessary, and some of the products have been shown to be subject to freezing due to the fact that organic materials absorb moisture.

4. Coated Sand

This infill is typically an acrylic-coated round sand often infused with an antimicrobial product for protection against bacteria, mold and mildew that can result in staining and odors. It is considered more abrasive than other infills but is considered less hazardous than a crumb rubber option.

Details concerning these SBR alternatives, and cost comparisons, are attached to this report.

Toxicity of Field Surface Materials

The other component of synthetic turf field that warrants environmental consideration is the turf fiber itself. Recent studies of emerging contaminants have been focused on a group of products referred to as perfluoroalkyl and polyfluoroalkyl substances, better known by the acronym PFAS. These products have been reported as being used in the extrusion process in the manufacture of the fibers (artificial grass blades) and the fiber backing. Having taken note of press reports regarding the alleged presence of PFAS in artificial turf surface materials, certain manufacturers have affirmatively claimed that they do not use any PFAS in their manufacturing process. This claim should be verifiable by available laboratory testing. Therefore, the Committee recommends that the Town: (1) select an artificial turf manufacturer that affirmatively claims not to use PFAS in its manufacturing process; and (2) commission a laboratory test prior to surface purchase and installation to confirm the manufacturer's claims.

1. Perfluoroalkyl and Polyfluoroalkyl Substances ("PFAS")

PFAS are a class of chemicals that do not break down or degrade in the environment. In the 1950s, manufacturers began using PFAS on a large scale to create consumer and industrial products that resist heat, oil, stains, grease, and water. In the late 1960s, PFAS first started showing up in human blood tests. In samples collected as part of the 1999- 2000 national sampling, PFAS were detected in more than 98 percent of blood serum samples collected from the general U.S. population, suggesting widespread chemical exposure. Most people encounter PFAS by drinking contaminated water or eating food raised or grown on or near places where PFAS were made or used. Pregnant mothers can transmit PFAS to their offspring during pregnancy and through breast milk.

More than 200 articles have been published on PFAS and their harmful effects on human health. Researchers have learned that PFAS bind to proteins and circulate throughout the human body, long after exposure. Research involving humans suggests that high levels of certain PFAS may lead to increased cholesterol levels, changes in liver enzymes, small decreases in infant birth weights, decreased vaccine response in children, increased risk of kidney or testicular cancer, and increased risk of high blood pressure or pre-eclampsia in pregnant women. Currently, scientists are still researching the health effects of exposures to mixtures of different PFAS.

2. Recommendation – Turf Fiber Extrusion Process

Despite denials by manufacturers' representatives regarding the presence of PFAS in newly developed turf fiber products, further study is warranted. At a minimum, any product determined for use by the community should be thoroughly researched, data analyzed, and vetted prior to installation. Additionally, a baseline for PFAS presence at currently recommended field locations should be undertaken and monitoring continued throughout the lifecycle of the proposed project. Given the proximity of the High School fields to the Barrington River and usable ground water supplies, ensuring that the proposed artificial turf field does not leech PFAS is of significant importance.

Studies of used artificial turf materials stockpiled for disposal have been commissioned by private parties as recently as 2019 such that the Committee believes private laboratory testing is available and not cost prohibitive. Given the uncertain, but seemingly troubling, health risks associated with PFAS, and affirmative claims by artificial turf manufacturers that no PFAS is used in their fiber extrusion processes there should be no reason for a turf supplier to protest a contract contingency related to laboratory testing for PFAS.

Injury Risk

Another highly publicized concern raised in connection with artificial turf fields is the risk of injuries to athletes. Studies of this issue are not totally conclusive usually because the studies conducted to date have been unable to control for a host of variables including the particular field materials used, the level of maintenance of the subject fields, the footwear worn by the injured athletes, the level of play, the sport being played and similar variables that may of may not be tracked in the ordinary course of injury reporting. Those studies that forthrightly explain the limitations of the data relied upon are deemed to be the most credible.

By subjective measures certain elite athletes have expressed a preference for natural grass fields over artificial turf citing safety concerns. However, their decision process is likely biased by the fact that the likely alternative to artificial turf in those circumstances is a professional quality natural grass surface that the Town would struggle to provide given resources and field use demands. For example, the United State Women's National Team has recently settled a lawsuit against U.S. Soccer in which, among other demands such as equal pay and equal access to charter flights, the team demanded that they no longer be required to play matches on artificial turf citing the fact that the U.S. Men's National Team was not required to play on artificial turf and the perceived health and safety risks associated with artificial turf.

Prior to the settlement, in 2017, Becca Roux, the president of the U.S. Women's Soccer player's union stated, with respect to the continuing use of artificial turf for women's matches, "Moving forward, we expect that U.S. Soccer will take into account our input on venue selection in addition to being more respectful of our players' health and safety."[4]

Similarly, the N.F.L. Players Association has recently demanded that the N.F.L.'s artificial turf fields be changed to natural grass. Citing a seemingly unpublished study[5], the N.F.L.P.A. president, J.C. Tretter, stated,

> The data supports the anecdotes you'll hear from me and other players: **artificial turf is significantly harder on the body than grass**. Based on NFL injury data collected from 2012 to 2018, not only was the contact injury rate for lower extremities higher during practices and games held on artificial turf, NFL players consistently experienced a much higher rate of non-contact lower extremity injuries on turf compared to natural surfaces. Specifically, players have a 28% higher rate of non-contact lower extremity injuries when playing on artificial turf. Of those non-contact injuries, players have a 32% higher rate of non-contact knee injuries on turf and a staggering 69% higher rate of non-contact foot/ankle injuries on turf compared to grass.[6]

(emphasis in original.)

Tretter noted that safety tests conducted by league officials were limited to Clegg tests that test only field hardness (in order to avoid concussion risks), but that other attributes of artificial turf fields were not considered. In explaining the concerns of players/union members, Tretter summarized the risks of non-contact injuries as follows

> First, a bit of physics: *Professional football players put extremely high levels of force and rotation onto the playing surface*. Grass will eventually give, *which often releases the cleat prior to reaching an injurious load*. On synthetic surfaces, there is less give, meaning our feet, ankles and knees absorb the force, which makes injury more likely to follow.[7]

(emphasis added.)

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[4] Murray, Caitlin, "U.S. Women Face an Old Foe: Artificial Turf." N.Y. Times, Sep. 22, 2017, B:4.

[5] Recently published studies seem to confirm Mr. Tretter's assertions regarding an increased risk of injury of NFL players competing on artificial turf and particularly the risk of non-contact injuries. *See e.g.* Mack, Christina, *et al.* "Higher Rates of Lower Extremity Injury on Synthetic Turf Compared with Natural Turf among National Football League Athletes: Epidemiological Confirmation of a Biomechanical Hypothesis." Am. J. Sports Med., Vol. 47, No. 1, p 189 (2019).

[6] Tretter, J.C., "Only Natural Grass Can Level the N.F.L.'s Playing Field" Sep. 30, 2020 *available at* https://nflpa.com/posts/only-natural-grass-can-level-the-nfls-playing-field.

[7] *Id.*

Tretter's comments illustrate well the limitations of existing scientific studies with respect to the risk of non-contact injuries. First, while the extreme forces exerted by NFL players undoubtedly lead to frequent injuries, it is not as clear whether less elite athletes exert those same levels of force. Second, Tretter's comments regarding the tendency of natural grass to release a cleat prior to infliction of an injurious load on the body illustrate the importance of proper footwear for players on artificial turf—a variable that no available study appears to control for or address in detail other than to make mention that it is a critical variable.

Against this backdrop of subjective preference for natural grass among elite athletes, uncontrolled variables such as level of play, the condition of available alternatives to artificial turf, and the wearing of surface appropriate footwear, the available studies of NCAA and professional athletes paint a murky picture. A recent review of the published literature on the subject found variation in study results that offer little by way of definitive evidence for or against artificial turf.[8] With respect to football injuries, the review of current literature indicated that there were studies with varying conclusions. One study cited noted a decreased risk of ACL injuries among high school football players on FieldTurf (a brand of artificial turf) when compared to natural grass. Another study of NCAA football players found no appreciable difference in ACL sprain incidence on the two surfaces. Later studies then contradicted those results finding significantly higher ACL injury rates among NFL and NCAA football players on artificial turf as compared to natural grass. In short, existing literature over differing study periods and involving different cohorts of athletes demonstrate significant uncertainty and the only conclusions that can be drawn from pre-existing studies on the subject are that: (1) further study is needed; (2) turf shoes as opposed to regular cleats are important to aid in the release of rotational forces that can cause injury, and (3) the maintenance of infill seems to be an important factor in reducing injury risks.[9]

The same group of authors that performed the metanalysis of available literature noted above conducted a retrospective cohort study specific to high school athletes competing on artificial turf.[10] By focusing specifically on high school athletes across a variety of sports, these researchers filled an important gap in existing literature which was previously confined to higher levels of competition and high school football without consideration of other sports or other levels of play. Given the desire to use the proposed artificial turf field for a variety of sports at lower levels of competition than the NCAA and professional leagues previously considered in existing studies, this study seemed particularly fitting.

In short, a review of injury statistics compiled over the 2017-18 athletic season, including reported injuries from 26 high schools with 3,896 participating student athletes, revealed that the incidence of injuries was fifty eight percent (58%) higher on artificial turf as compared with

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[8] Sivasundarum, L., *et al.*, "Injury Risk Among Athletes on Artificial Turf: A Review of Current Literature." Current Orthopaedic Prac., Vol. 32, No. 5, p. 512 (Sep./Oct. 2021).
[9] *Id.* at 512-13.

[10] Paliobeis, Andrew, *et al*, "Injury Incidence is Higher on Artificial Turf Compared with Natural Grass in High School Athletes: a retrospective cohort study." Current Orthopaedic Prac., Vol. 32, No. 4, p. 355 (Jul./Aug 2021)

natural grass playing surfaces. The study included student athletes participating in competition at the freshman to varsity levels in baseball, softball, football, soccer (both boys and girls), field hockey, lacrosse (both boys and girls) and rugby and considered the 953 injuries occurring within the cohort during the study period.

The results of the study offer a troubling picture summarized in the study abstract:

ABSTRACT

Background:

Prior investigations have demonstrated increased injury risk on artificial turf at the collegiate and professional levels. However, no prior study has examined this risk among high school athletics beyond football. The purpose of this study was to compare injury incidences on artificial versus natural playing surfaces among high school athletes.

Methods:

Data collected from 26 high schools was analyzed to compare injury incidences on artificial turf versus natural grass based on sport. Analyses were also performed to compare injury incidence by injury location (upper extremity, lower extremity, torso), sport, level of competitive play (freshman, junior varsity, varsity), and practice versus competition.

Results:

We identified 953 injuries, with 61% (n = 585) occurring on turf and 39% (n = 368) on grass. Athletes were 58% more likely to sustain injuries on artificial turf than natural grass relative risk ratio [RR] 1.5897, confidence interval [CI]: 1.4062 to 1.7971, $P < 0.0001$). Lower extremity (RR 1.9597, CI: 1.6169 to 2.3752, $P < 0.0001$), torso (RR 1.8636, CI: 1.1123 to 3.1225, $P = 0.0181$), and upper extremity (RR 1.4494, CI: 1.1104 to 1.8919, $P = 0.0063$) injuries were significantly more likely to occur on artificial turf. Football (RR 1.4572, CI: 1.2726 to 1.6687, $P < 0.0001$), girls soccer (RR 1.7073, CI: 1.1857 to 2.4583, $P = 0.0040$), boys soccer (RR 1.8286, CI: 1.2296 to 2.7194, $P = 0.0029$), and rugby (RR 23.0000, CI: 3.1998 to 165.3244, $P = 0.0018$) had higher injury incidences on artificial turf.

In addition to higher injury rates among athletes playing football, soccer and rugby on artificial turf, the study noted significantly higher injury rates for athletes participating in field

hockey and girls lacrosse on artificial turf. Injury rates for baseball and softball players were lower on artificial turf than natural grass fields.[11]

Key takeaways from the study were that: (1) more study was needed to explain certain variances between the authors' hypotheses and results; (2) that infill levels and field conditions of artificial playing surfaces were crucial to controlling injuries; and (3) that selection of footwear appropriate for artificial turf was likely to play a major impact in the reduction of injuries on artificial turf surfaces.[12]

Despite the stark findings of this study, which raise serious and unanswered questions regarding the safety of artificial turf surfaces for high school athletes, the authors went to lengths to explain the limitations of the data used to compile their results. Most importantly, given the limitation of injury reporting data, the study could not consider the artificial turf field conditions and specifications where injuries occurred, or the footwear worn by the injured athletes. Since both of these important factors would remain within the control of the athletes and Town in the event of construction of an artificial turf field, it is imperative that field maintenance and proper guidance as to athletic equipment be made part of any initiative to advance towards construction.

To the extent people question the results of the high school athletics study cited above on the basis that they have not personally observed many injuries on artificial turf playing surfaces, it is important to note that a fifty eight percent increase in injuries might not be noticeable even to careful observers. For example, assume that a coach might expect two player injuries per season that involve lost playing time, the occurrence of a third such injury would not seem out of the ordinary and could be attributed to nothing more than bad luck. However, this third injury would result in an injury rate fifty percent higher than what was expected. It is only through the compilation of data involving thousands of players over a significant period of time that such statistics become noticeable and yield useful data on which decisions can be appropriately based. Unfortunately, more detailed data concerning this issue is not available aside from a long list of studies that identify questions worthy of further consideration while explaining the limitations and uncontrolled variables that might have affected results. Weighing the merits of these studies individually is unlikely to assist in the decision of whether to construct an artificial turf field and is beyond the expertise of the Committee's members. The metanalysis of existing literature on the subject (Sivasundarum, L., *et al.*) describes the uncontrollable variables and open questions regarding injuries on artificial turf. The existence of a very recent retrospective study of high school athletes finding a 58% increase in injury rates, despite the study's limitations, is troubling.

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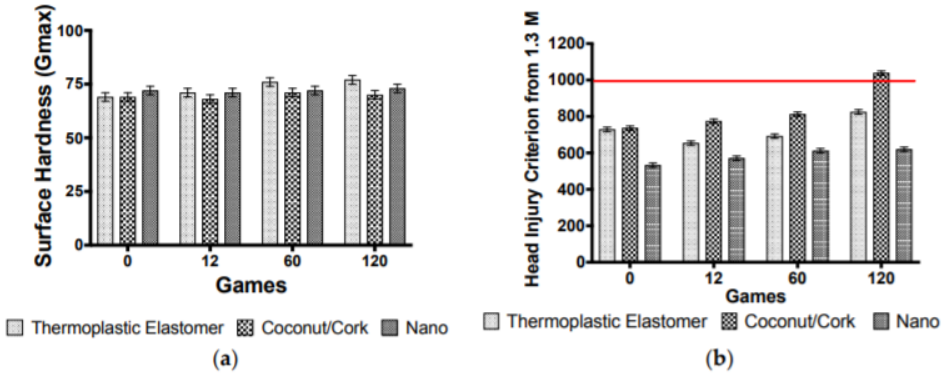
[11] *Id.* at 357. The study did not specify whether the softball and baseball fields at issue were fully covered in artificial turf or whether they consisted of artificial turf with dirt base paths and pitchers' mounds.
[12] *Id.* at 358-59.

Concussion Risk

Regularly raised concerns about increased concussion risks associated with artificial turf were well founded when they were initially raised because early generation turf surfaces often consisted of a thin nylon carpet laid over a hard surface such as concrete or compacted gravel. The latest generation artificial turf surfaces have addressed the surface hardness issues that gave rise to these concerns through the introduction of deep infill layers and subsurface pads[13]. Artificial turf surfaces are regularly subjected to Clegg testing which measures the hardness of a surface (resulting in a GMax rating) and latest generation artificial playing surfaces regularly match the performance of natural grass surfaces in these tests. However, GMax ratings do not actually correlate with head injury risk. Rather, another field testing method called a head injury criterion (HIC) test more accurately determines head injury risk by determining the theoretical fall height from which someone would suffer injury called a "critical fall height." The following chart illustrates the manner in which GMax ratings derived from Clegg hardness tests fail to accurately assess the risk of head trauma from an impact with a playing surface. [14]



Given the variability of natural grass surface quality, and periods of freeze, there is no way to accurately assess the critical fall height and HIC on any of Barrington's natural grass surfaces without professional testing at the time of field use. A critical fall height on well-maintained unfrozen natural grass is approximately six feet, and few artificial turf surfaces can match that standard without installation of a shock pad.

A shock pad is, as the name suggests, a pad placed over the field substrate and below the grass carpet to offer additional shock absorption. A similar shock absorption effect could be achieved by simply adding a thicker layer of infill over the turf carpet. However, this would

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[13] An ancillary benefit of a subsurface pad is that it can reportedly help to prolong the life of the polypropylene carpet surface in much the same way that a rug pad can help to prolong the life of an area rug.

[14] *See* Dickson, K., *et al.*, "Impact of Alternative Synthetic Turf Infills on Athlete Performance and Safety." MDPI Proceedings 2020, Presented at the 13th Conference of the International Sports Engineering Association, Online, 22–26 June 2020, p. 3.

create other safety issues as a thicker layer of infill leads to a lack of player traction (as if a person were running on a sandy beach). A thicker infill layer would also alter the playing characteristics of an artificial turf field in unacceptable ways such as preventing balls from bouncing or rolling naturally.

With the installation of a shock pad and through careful monitoring of infill compaction and depth, studies suggest that third generation artificial turf surfaces (consisting of a pad, carpet and infill over a gravel substrate) can meet or exceed the HIC of natural playing surfaces.[15] The particular choice of infill can have significant impacts on the relative performance of an artificial turf surface[16] such that the Town should require any selected vendor to provide detailed HIC testing results in order to have its products considered for selection. The failure to do so could subject athletes to unknown additional concussion risks relative to natural grass playing surfaces.

Abrasions and Infections

Commonly referred to as "turf burns," abrasions resulting from sliding along artificial turf surfaces are not uncommon, but researchers theorize that they are underreported because the nature of the injury is mild enough that medical attention is not required and little of any playing time is lost.[17] The term "turf burn" is potentially a misnomer since it is unclear to researchers that the injury is caused by friction or heat as opposed to the mechanical forces at work when a player slides over artificial turf causing an abrasion.

Regardless of the process by which the injury is caused, players subjectively complain about the abrasiveness of artificial turf surfaces and anecdotally report an increased risk of abrasion.[18] Given the lack of abrasion reporting (due to the fact that the injury is not likely severe enough to require attention), and in an effort to help manufacturers develop less abrasive artificial surfaces, researchers attempted to recreate impact and sliding related injuries by using the ears of slaughtered rabbits as a stand-in for human skin in a laboratory setting. The results of the study indicate that artificial turf surfaces inflict significantly more abrasions on tissue than natural turf surfaces. The wetting of an artificial turf surface significantly decreased the extent of abrasion, but even when wet artificial turf materials still resulted in significantly

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[15] Theobald, P., *et al.* "The Predicted Risk of Head Injury from Fall-Related Impacts on to Third Generation Artificial Turf and Grass Soccer Surfaces: A Comparative Biomechanical Analysis." Sports Biomechanics, Vol. 9, No. 1 (Mar. 2010) pp. 29-37.

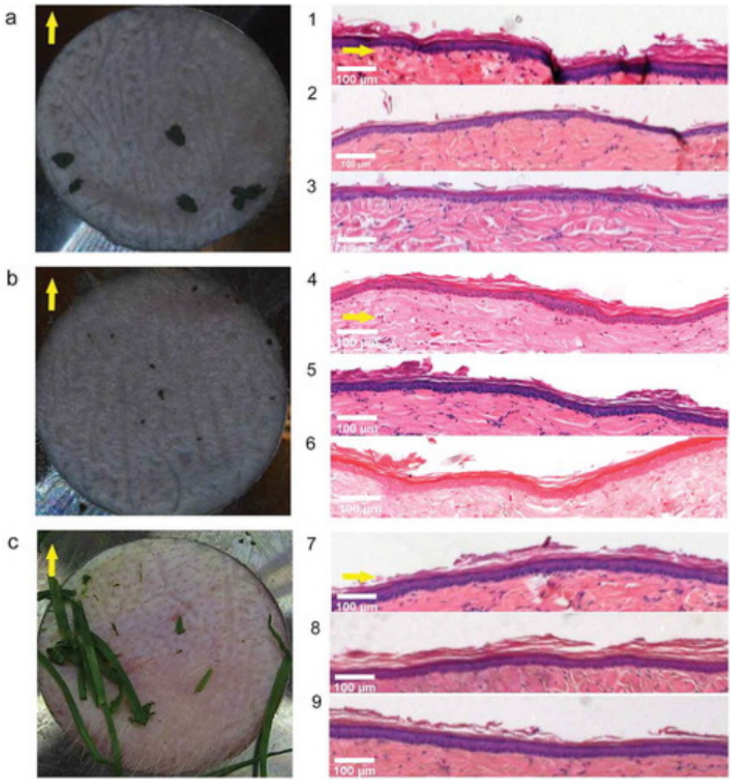
[16] Dickson, K., *et al.*, p.5.

[17] van den Eijnde, *et al*. "Understanding the Acute Skin Injury Mechanism Caused by Player-Surface Contact During Soccer." Orthop. J. Sports Med., Vol. 2, No. 5 (May 2014) *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4555542/.

[18] van den Eijnde, *et al.* "The Load Tolerance of Skin During Impact on Artificial Turf using *ex-vivo* Skin as the Readout System." Sci. and Med. in Football, Vol. 2, Iss. 1 (2018) *available at* https://www.tandfonline.com/doi/full/10.1080/24733938.2017.1390593.

more abrasion on the rabbit ears used than natural grass.[19] The following figure from the study offers some visual comparison for reference:

Figure 2. Macroscopic images of the rabbit ear immediate after test run 1 on dry artificial turf (a). Wet artificial turf (b) and natural grass (c). The right column consecutively represents the skin histology after test runs 18, 9 and 1 on dry artificial turf (1, 2, 3). wet artificial turf (4, 5, 6) and natural grass (7, 8, 9), respectively.



While newer generation infills and polypropylene carpet seems to have significantly improved upon earlier generation nylon carpet materials in terms of abrasiveness, they underperform in this regard relative to a well-maintained natural grass surface. This must be considered in context, however. Barrington's fields often have bare patches and no studies seem to offer a scientific comparison of artificial grass to natural grass surfaces in poor condition in a manner that would permit any kind of statistical comparison. Regardless, it would be worthwhile to advise players to wear proper protective equipment in order to reduce the risk of abrasion from any artificial playing surface.

[19] *Id.*

Somewhat related to the issue of abrasions is the issue of infection that has been raised as a concern with respect to artificial turf. The EPA's ongoing study of artificial turf has indicated that, on outdoor fields, the presence of bacteria is not materially different from what would be found on a natural playing surface. In light of this finding, it seems logical that any increase in the incidence of infection wounds (if there is any such increase) might result more from a general increase of incidence in abrasions rather than the presence of more infectious agents on artificial turf as compared to natural grass. Again, this concern must be considered in context since Barrington's natural grass fields are regularly littered with goose droppings—a factor not considered in any study located. This makes an "apples to apples" comparison that would fit Barrington's particular situation near impossible.

Heat Concerns

Artificial turf playing surfaces can become very hot and measures should be taken to mitigate this during midday in the warmer seasons. The studies of this issue are relatively simple and require little discussion. Measurements of artificial turf surface temperatures taken by researchers at Brigham Young University yielded the following results:

Table 1.

Surface	**Average Surface Temperature between 7:00 AM and 7:00 PM**	
Soccer	117.38º F	high 157º F
Football	117.04º F	high 156º F
Natural Turf	78.19º F	high 88.5º F
Concrete	94.08º F	
Asphalt	109.62º F	
Bare Soil	98.23º F	

Table 2.

Two inch depth	**Average Soil Temperature between 7:00 AM and 7:00 PM**	
Soccer	95.33º F	high 116º F
Football	96.48º F	high 116.75º F
Natural Turf	80.42º F	high 90.75º F
Bare Soil	90.08º F	

Table 3.

Shade	**Average Temperature between 9:00 AM and 2:00 PM**	
Surface Temperature of Natural Turf	66.35º F	high 75º F
Surface Temperature of Artificial Turf	75.89º F	high 99º F
Average Air Temperature	81.42º F	

The peak surface temperature reached during the study period was 200 degrees Fahrenheit when air temperatures were 98 degrees. Irrigation of artificial turf was effective in reducing surface temperatures for a matter of minutes and temperatures quickly rebounded to over 120 degrees. At the time of the study, BYU athletics prohibited use of the fields when surface temperatures exceeded 120 degrees based upon reports that people will suffer burns from ten minutes of contact with a surface exceeding 120 degrees.[20] More relevant to Barrington's climate, coaches and athletic directors in Bloomfield and Windsor, Connecticut indicate that they test field temperatures around events and will move practices elsewhere (including indoors) during midday on hot days due to the artificial field temperatures.[21]

Marketing literature from certain organic infill manufacturers indicate that the use of their infills will permit users to reduce field surface temperatures to levels similar to natural grass fields. These claims make logical sense in that organic infill would absorb moisture resulting in cooling through evaporation. However, this benefit needs to be weighed against cold weather performance characteristics when the infill's absorption of moisture could lead to surface freezing in cold conditions. In the event that a suitable organic infill, such as BrockFill, is determined not to be suitable for performance reasons, the Town should anticipate that certain midday events on hot days would need to be rescheduled or relocated. This is likely to be a minimal interruption to athletics since (with the exception of occasional fall pre-season practices and some late spring season events) there are few events taking place during mid-day when summer temperatures are likely.

Environmental Issues

Many of the environmental concerns associated with artificial turf fields, such as the alleged presence of PFAS in surface materials and the presence of chemicals and metals in infill materials, have been discussed above in the context of health and safety and that discussion will not be repeated here. Other environmental concerns, such as concerns about the use of plastics generally, would not benefit from discussion. It is true that, even using organic infill, an artificial turf field is composed of a significant amount of plastic in the form of a shock pad and surface carpet.

Questions have been previously raised concerning the recyclability of the components of an artificial turf field. With respect to infill, the question largely depends upon the material used. Organic infill may be reused as topdressing on natural fields or simply composted. Synthetic infills regardless of material are not readily recyclable though it is possible that they may be reused at the time of surface replacement. Given the limited amount of time that non-SBR infills have been widely in use, no reliable conclusion can be drawn as to the reuse of a synthetic infill

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[20] Williams and Pulley, "Synthetic Surface Heat Studies" *available at* https://aces.nmsu.edu/programs/turf/documents/brigham-young-study.pdf.

[21] Hladky, Gregory, "Heat Waves Bring Warnings about Synthetic Turf Risks," Hartford Courant, Aug. 13, 2016 *available at* https://www.courant.com/community/windsor/hc-synthetic-turf-heat-20160813-story.html.

other that to state that it is possible depending upon the condition of the infill at the time of surface replacement.

With respect to an artificial turf carpet, whether it is possible to recycle it depends upon the manner in which it was manufactured. There are two types of carpets used widely today—tufted and woven. A tufted carpet consists of short artificial blades of grass pressed through a backing and then adhered to it with a urethane adhesive. This urethane backing cannot reasonably be removed through any currently available process and that renders a tufted carpet non-recyclable. On the other hand, a woven carpet, in which the artificial grass blades are held together mechanically through weaving rather than with an adhesive, is capable of being recycled. However, there is reportedly only one facility that presently recycles artificial turf carpet. It is located in Europe and reportedly is not accepting used fields from the U.S. at this time. The key question, however, is not whether the carpet is presently recyclable, but whether it will be recyclable at the end of its life—anticipated to be a decade from now.[22] There is no basis for the Committee to make a prediction about that question.

Aside from recyclability, however, there are other good reasons to select a woven carpet as opposed to a tufted one. For example, a manufacturer called Green Fields presently makes a woven carpet called Iron Turf. The fibers used in manufacturing Iron Turf reportedly have a softer feel than competitors. They are thicker than other fibers which results in a number of benefits including durability, a tendency to stay upright which better mimics natural grass and provides a more natural playability in terms of the behavior of balls. Supposedly, the weaving pattern helps to reduce infill splash and prevents infill from being disbursed in a way that would render the field less safe. Iron Turf fibers are reportedly ridged such that glare off of the surface is reduced. Finally, while it is not clear whether a woven carpet would be recyclable at the end of its useful life, a more durable woven surface would at least forestall replacement thereby reducing waste in the longer-term as compared to alternatives and some commercially available means of recycling may arise in the interim. While other materials should be considered in the event that the project proceeds to bid, these characteristics should be kept in mind in the process of material selection.

Finally, as part of any weighing of environmental considerations, it is important to note that the proposed location of the artificial turf surface—eight acres near the Barrington River—is currently treated with fertilizers and weed preventers on a regular basis and is watered to maintain grass. While some means of irrigation would still be advisable to maintain an artificial turf field, watering needs would be significantly reduced and no fertilizers or herbicides would need to be used.

[22] Most manufacturers offer at least an eight-year warranty for carpet materials. Some have reportedly lasted longer than ten years. The lifecycle of a field cannot be pegged in advance because much depends upon the level of use and maintenance and environmental conditions. The Committee believes that ten-year lifespan is a reasonable estimate based upon experience of users locally. However, some level of surface degradation should be expected in the later years.

Conclusion

As explained at the outset, the Committee set out to resolve as many expressed concerns as possible in relation to artificial turf. The Committee was able to reach consensus conclusions on a number of issues including an identification of the benefits that artificial turf offers, a concept for a large multi-use and flexible playing surface that would serve the needs of the community generally and athletes of all ages, the approximate identification of costs associated with construction and other issues described above. Ultimately, questions remain as to certain health and safety issues given the inconclusive nature of existing studies and whether residents will vote to bear the financial cost of proceeding.

If the decision is made to proceed, then next step would be to develop detailed designs which would incorporate: field layouts, striping options to accommodate multiple sports and field configurations, surface specifications for particular uses (different sports usually require somewhat different surface materials due to the unique requirements of the game being played) the particulars of player and spectator amenities (benches, dugouts, bleachers and the like). Development of these designs would be a costly undertaking in its own right and the decision of whether or not to proceed at all should be made before those funds are expended.

Finances and Fees Work Group Report

The finances work group explored two areas of cost: ordinary maintenance costs and the cost to add capacity (new fields, acquired or redeveloped). The following are the considerations the Town should take into account when evaluating if and how to adjust field use fees or the financing of new fields.

Notes about field use fees

- They should offset the portion of the town's current/historic costs for field maintenance that is not covered by other sources (i.e. School Department budget transfer and Cell Tower Revenue)
- They should appropriately reflect the relative use/impact of different leagues
    - Number of athletes
    - Impact of athletes (5-year-olds playing t-ball vs teenagers playing football)
- They should not be cost prohibitive to players or leagues
- They should be consistent and fair
- As the town's costs rise, fees may rise, but only should if it is tied to higher quality or additional access (inflation aside)
- Another option would be to tie new costs to league fees; such as the cost of league scheduling software — if there is a direct benefit to the leagues

Work Group Recommendations

1. Barrington should implement a "rate per time" method of assessing fees. For example, $XX per field per hour. With the following considerations:

- The rate should be set so that the league reserving the most field hours would pay a similar total to that which was paid by the team with the most athletes under the prior "per-athlete" method.
- A higher rate could be used for one-off rentals, like outside tournaments or events
- A higher rate can be charged to groups from outside of Barrington
- Leagues and/or ad hoc renters could apply for waivers (individual/ad hoc renters at Town administration discretion, leagues at the Council's discretion)

2. The town should protect the portion of non-tax revenue available to offset field maintenance expenses derived from cell tower leasing, now that the reserved account for such purposes has been expanded to other recreation uses.

3. New field acquisition or development should include a fundraising campaign with community and corporate sponsor recognition opportunities. This is possible on municipal or school property, and allows the burden of cost to be shared by volunteers engaging donors, and may avoid the need for issuing a bond.

Full AHAFAC Recommendations

It is the recommendation of the AHAFAC that the Town Council and School Committee, collectively or respectively, depending on the required approvals for a given item, adopt, pursue, implement or otherwise effectuate each of the following changes in order to provide for equitable, robust and high quality access to recreational and competitive field sports surfaces.

The recommendations below are being made complementary to one another to achieve the best overall outcome. These outcomes include more field availability, more consistent access to fields, more transparency, more user-friendly scheduling, and improved quality of field surfaces.

1. Natural Fields

With a long-term lease of Haines Park in place, we have an opportunity to develop two full size, multi-use fields and renovate the baseball diamond known as Harrington Field. This proposal would deliver additional and high quality natural grass fields for our community and help alleviate field-use demands during peak hours in the fall and spring. The hope would be to better utilize under-leveraged space and take full advantage of this resource at a relatively low cost. Note: Parking and lack of restroom facilities would continue to be major challenges for this facility. So, while this piece of the overall field enhancement initiative would be helpful, we do not feel it would be a stand alone solution for our athletic field needs in Barrington.

2. Artificial Fields

It was determined that the best location for an artificial turf playing surface would be on the east side of the Barrington High School campus on the fields running from Federal Road to Lincoln Avenue along County Road, for the purposes of developing a conceptual model with which to base artificial turf recommendations on.

Questions still remain as to certain health and safety issues given the inconclusive nature of existing studies. Recommendations include not using ground tire crumb for infill and using a more organic material and source field carpet from a manufacturer that does not use PFAS in its manufacturing and the Town commission an independent material analysis to confirm the manufacturer’s claims as part of any purchasing decision. The cost is estimated to be around $10 a square foot with a total cost estimate at roughly $3-4million, not including lights. Adding lights would cost approximately $80/light pole.

If the decision is made to proceed and install an artificial turf field, next steps should include developing detailed designs that would incorporate: field layouts, striping options to accommodate multiple sports and field configurations, surface specifications for particular uses (different sports usually require somewhat different surface materials due to the unique requirements of the game being played) and the particulars of player and spectator amenities

(benches, dugouts, bleachers and the like). It is recommended to hire a consultant to develop these plans.

3. Tracking and Scheduling

Software is available that will allow leagues and potentially members of the public to reserve fields, amend their reservations and view what fields are available at a given time. This provides better transparency between leagues, the Town and Schools, and the public. It will also enable Barrington to maximize use of its fields. This will also support the need to better maintain a schedule of field “resting.”

The time spent maintaining each field and the materials used for each field should be tracked and monitored in order to ensure efficiency and to determine the appropriate distribution of costs.

4. Apply fees to reservations

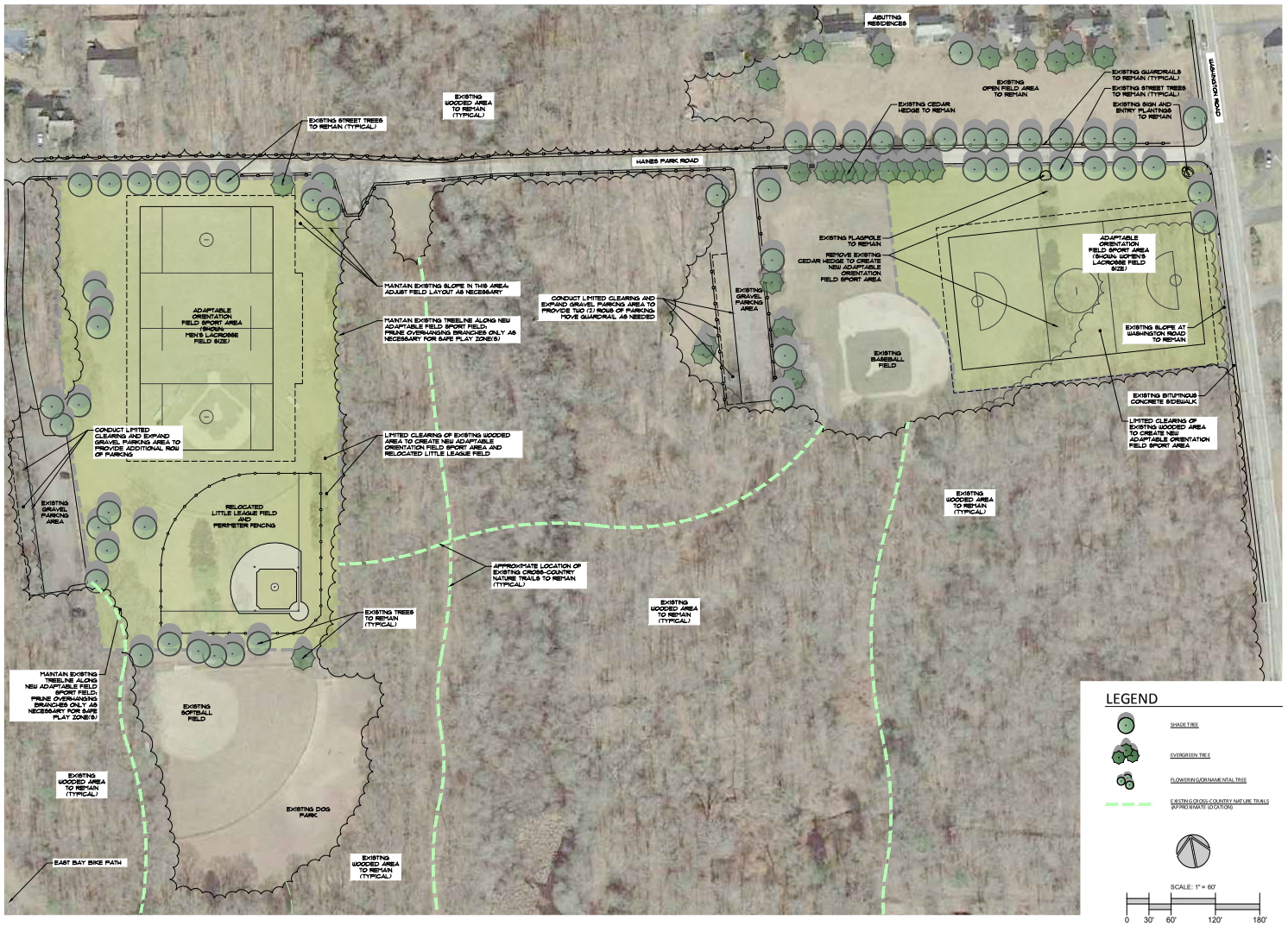
It is the Town’s responsibility to maintain the quality of our public spaces and keep the fields in good repair. The space is public; a league athlete should not have to pay an additional fee that an unaffiliated athlete does not have to pay. Therefore, using the field should be free of charge. However, because it is a public space, when a league wants to reserve exclusive use of a field, a fee should be paid so that the taxpayers are “compensated” for the public loss of that field time. The rate should be such that the total amount of revenue from leagues is consistent with the average of the prior few years.

5. Establish a Capital Campaign Committee

The cost of implementing these recommendations will be significant. As a town with many residents who are passionate about recreational and competitive sports, and many families with substantial financial resources, the opportunity to generate a meaningful portion of cost through fundraising should be taken.

Appendices

Appendix A - Haines Park Option A



REVISION HISTORY:

DATE	ISSUED FOR

REFERENCES:

1. Aerial Photography as available through GOOGLE EARTH PRO. Imagery Date: 2/26/18
2. Site Visit and Review of Existing Conditions by Kevin M. Alverson, LA on 10/24/19

Haines Memorial Park Renovation

Washington Road
Barrington, RI

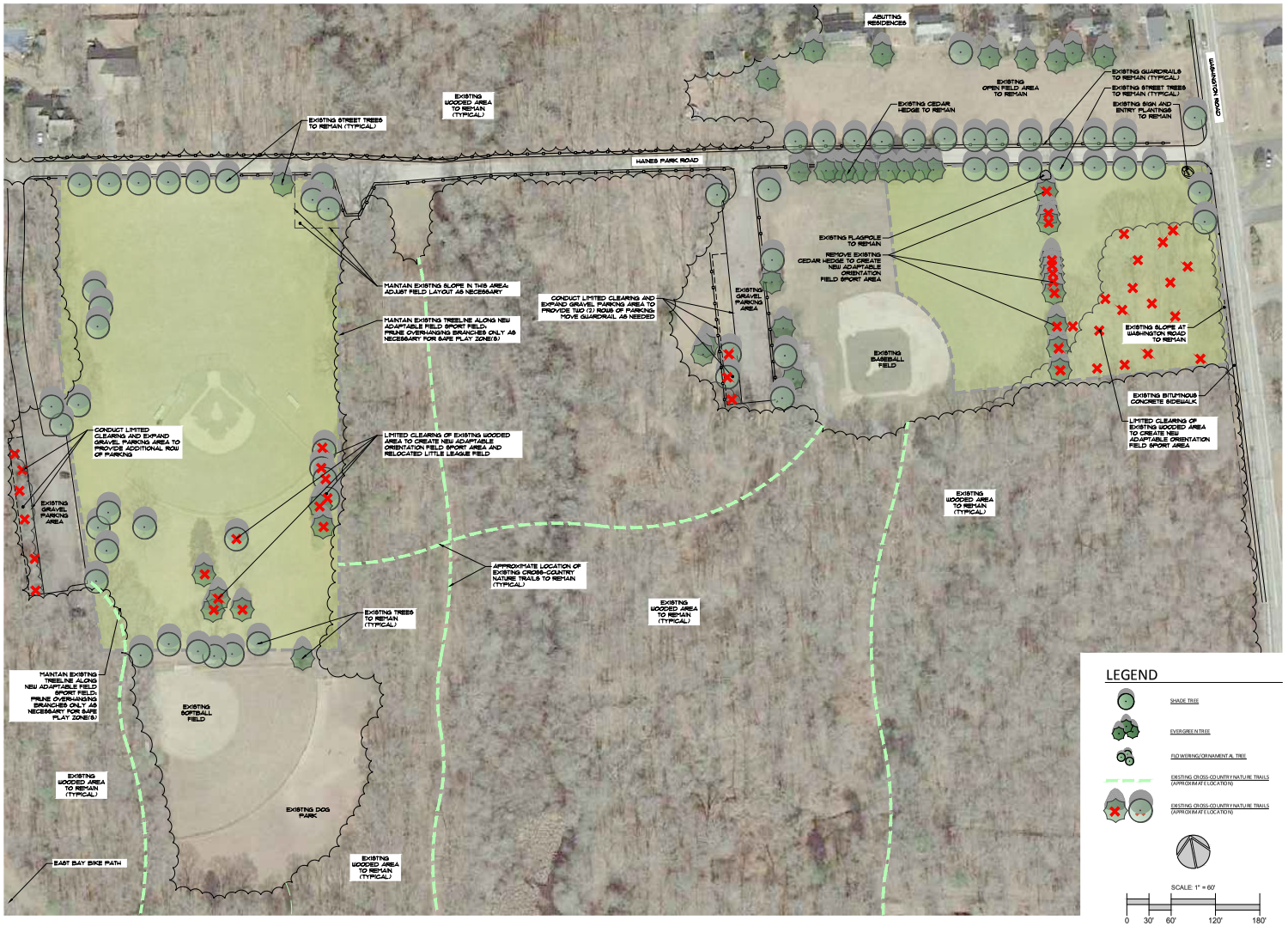
Prepared For:
The Town of Barrington, RI

Kevin M. Alverson
LANDSCAPE ARCHITECTURE
350 Annaquatucket Road 401 - 268 - 0044
Wickford, RI 02852 KevinMAlversonLA.com

Master Plan

Project #: 2.123.278	Sheet 2 of 2
Scale: As Shown Drawn By: KMA Checked By: KMA Date: January 3, 2020	2

Appendix B – Haines Park Option B



2.123.278 HainesMemorialParkRenovation_2020.dwg

REVISION HISTORY:

DATE	ISSUED FOR

REFERENCES:

1. Aerial Photography as available through GOOGLE EARTH PRO. Imagery Date: 2/26/18
2. Site Visit and Review of Existing Conditions by Kevin M. Alverson, LA on 10/24/19

Haines Memorial Park Renovation

Washington Road
Barrington, RI

Prepared For:
The Town of Barrington, RI

Kevin M. Alverson
LANDSCAPE ARCHITECTURE
310 Annaquatucket Road
Wickford, RI 02852
401 - 338 - 0048
KevinMAlversonLA.com

Existing Conditions and Site Preparation

Project #: 2.123.278	Sheet 1 of 2
Scale: As Shown	1
Drawn By: KMA	
Checked By: KMA	
Date: January 3, 2020	

Appendix C – Field Maintenance and Acquisition Work Group – Addendum

Since submission of the original report of the Field Maintenance & Acquisition Work Group in the spring of 2020, there have been a few developments related to some of the group's recommendations. These are summarized below:

Maintenance

Department of Public Works Personnel

As was noted in the original report, the Department of Public Works (DPW) was unable to meet field maintenance needs due to a shortage of personnel. Two additional full-time personnel were approved for hire at the July, 2020 Financial Town Meeting. It was the recommendation of this group that funding for an additional two full-time employees be approved at the next Financial Town Meeting. This was done on June 16, 2021. Unfortunately, due to the loss of one existing employee and one employee who is on a long-term disability leave, in combination with a labor shortage, there has been no effective increase in the number of DPW employees. It is hoped that this situation will be rectified as soon as possible, as this will improve the maintenance of playing fields throughout Town.

Acquisition and Development

In keeping with the Working Group's recommendation that the Town pursue a long-term lease with the State Department of Environmental Management (DEM) for Haines Park, a new, 30-year lease has been agreed to. During lease negotiations with the State, there was discussion regarding the improvements to the fields at this site that this group has recommended. DEM agreed, *in principle*, to consideration of such changes, to be made at the Town's expense. (See Appendices A. & B.)