



Synthetic Turf Improvement Projects

City of Newton

CDM Smith

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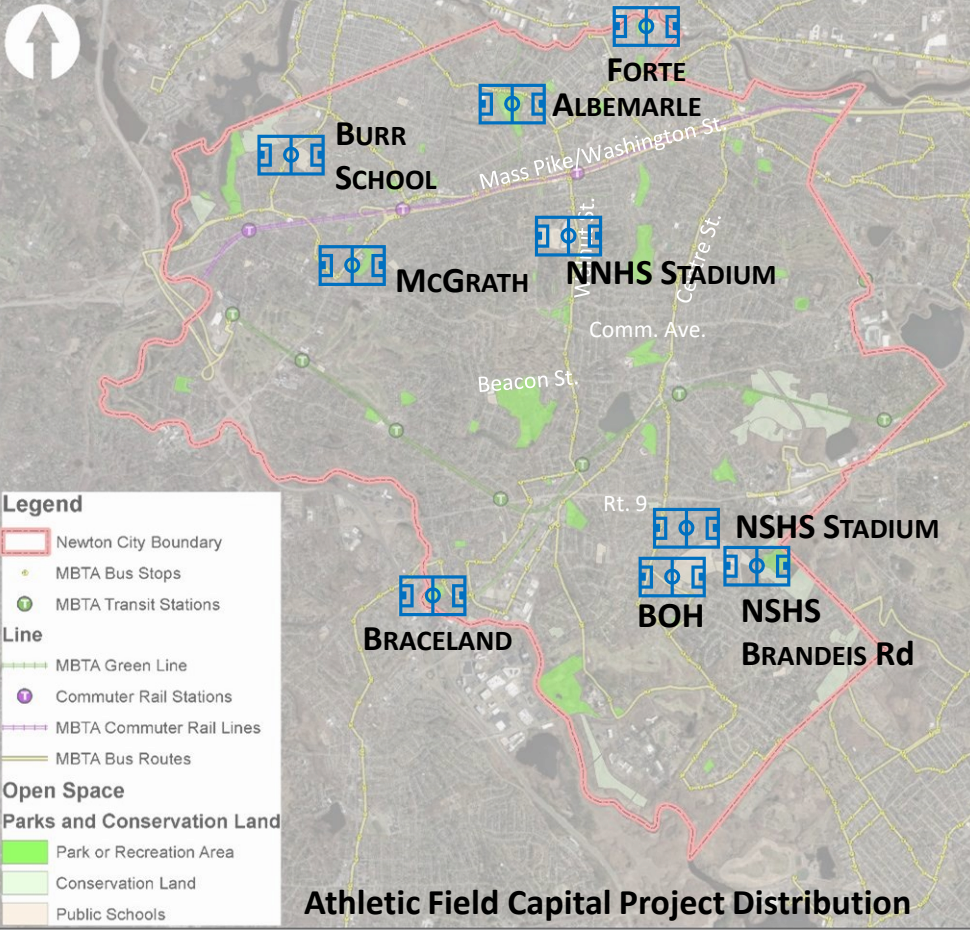
November 2, 2022

**CDM
Smith**



AGENDA

- RECAP OF ATHLETIC FIELDS CAPITAL PLAN
- ATHLETIC STAKEHOLDERS AND NEEDS
- BALANCED APPROACH TO MATERIAL SELECTION
- NEWTON HS SYNTHETIC TURF REPLACEMENT PROJECT
- MATERIAL EVALUATION, CONSIDERATIONS AND SELECTION



ATHLETIC FIELDS PLAN

- ALBEMARLE PARK
- FORTE PARK RELIGHTING
- BURR SCHOOL
- BROWN/OAK HILL FIELDS
- MCGRATH PARK
- BOBBY BRACELAND
- NEWTON SOUTH BRANDEIS SPORTS LIGHTING
- NSHS SYNTHETIC TURF REPLACEMENT
- NEWTON NORTH TIGER STADIUM LIGHTING
- NNHS SYNTHETIC TURF REPLACEMENT

TOTAL: 10 PROJECTS; 8 LOCATIONS

Newton Parks, Recreation and Culture Department
Athletic Fields Capital Improvement Plan

Athletic Fields Capital Improvement Plan Goals & Objectives

FIELD + PARK IMPROVEMENT GOALS

- IMPROVE QUALITY AND QUANTITY OF USABLE MULTIUSE FIELD SPACE
 - *INCREASE EVENING PLAY OPPORTUNITIES*
 - *REPLACE END-OF-LIFE SPORTS LIGHTING*
 - *IMPROVE QUALITY OF ATHLETIC FIELD SURFACES*
 - *INCREASE AVAILABLE REGULATION-SIZE ATHLETIC FIELDS ON PARK AND SCHOOL LANDS*
- IMPROVE ACCESSIBILITY IN PARK AND FIELD AMENITIES
- ESTABLISH BETTER PARK CONSTRUCTION MANAGEMENT
- IMPROVE OPERATION & MAINTENANCE POST-CONSTRUCTION
- INVEST EQUITABLY IN NEWTON'S ATHLETIC FIELDS + PARKS ACROSS THE CITY
- SMART AND SUSTAINABLE TECHNOLOGY FOR BETTER RESOURCE MANGEMENT
 - *SMART IRRIGATION*
 - *SMART LIGHTING*
 - *SUSTAINABLE MATERIALS*
 - *CONSISTANT SITE AMENITY SPECS (BACK STOPS, NETTING INFIELDS, BENCHES ETC.)*



FIELDS COMMUNITY, STAKEHOLDER AND COMMISSION MEETINGS TO DATE

Athletic Fields Strategic Plan

- Athletic Field Sub-Committee - September 2020 Thru January 2022
- Athletic Fields Engineering Services RFQ - September 2021 Thru January 2022
- City Council Update - December 8th, 2021
- Conservation Commission Update - January 6th, 2022
- City Council Programs & Services Update - June 22nd, 2022
- Parks and Recreation Commission Update - June 22nd, 2022
- Commission on Disability Update - July 11th, 2022

Albemarle:

- Community meeting 1 - October 20th, 2021
- Community Meeting 2 - May 3rd, 2022
- Community Meeting 3 - June 2nd, 2022
- Parks & Recreation Commission – April 25th; June 27th

BOH, Burr School + McGrath:

- Community meeting 1 - October 20th, 2021; October 27th, 2021
- Community Meeting 2 - June 13th, 2022
- Parks & Recreation Commission (McGrath ONLY) – October 17th, 2022

Brandeis Rd Field Sports Lighting:

- Community meeting 1 - NOVEMBER 10TH, 2021
- Community Meeting 2 - DECEMBER 9TH, 2021
- Light Demonstration – DECEMBER 20TH, 2021
- Buffer Planting w/ Abutters - January 19th, 2022

Newton North Sports Lighting:

- Community meeting 1 - APRIL 5TH, 2022
- Light Demonstration – APRIL 7TH, 2022

Newton Synthetic Turf Replacements:

- Community meeting 1 - OCTOBER 24TH, 2022
- Community meeting 2 - NOVEMBER 2ND, 2022

Focus Groups and Stakeholders

- Friends of Albemarle
- Burr School PTO & Principal
- BOH Schools PTO & Principals
- BOH Athletic Directors
- Newton South HS Athletic Director
- Newton North HS Athletic Director
- F.A. Day MS Athletic Director + Principal
- Bike Newton
- Safe Routes to Schools
- Newton Girls Soccer
- Newton Youth Soccer
- Ultimate Disk
- Newton Little League
- Newton Girls Softball
- Friends of Newton Tennis
- City Council
- Abutters and other community members

Turf Field Needs for Both High Schools

NEWTON SOUTH HS TEAMS

FALL:

- 3 GIRLS SOCCER TEAMS (9TH, JV, VARSITY)
- 3 BOYS SOCCER TEAMS (9TH, JV, VARSITY)
- 3 FOOTBALL TEAMS (JV, VARSITY)
- 3 FIELD HOCKEY TEAMS (9TH, JV, VARSITY)
- 2 CROSS COUNTRY TEAMS ON TRACK

WINTER:

- 2 GIRLS TRACK TEAMS (WEATHER PERMITTING)
- 2 BOYS TRACK TEAMS (WEATHER PERMITTING)

SPRING:

- 3 GIRLS LACROSSE TEAMS (ALL LEVELS)
- 3 BOYS LACROSSE TEAMS (ALL LEVELS)
- 2 OUTDOOR TRACK (VARSITY, JV)
- 2 MIDDLE SCHOOL TRACK TEAMS
- 1 UNIFIED TRACK TEAM
- POTENTIAL RUGBY TEAMS

UP TO 11 PRACTICES/GAMES EACH WEEKDAY TO SCHEDULE

NEWTON NORTH HS TEAMS

FALL:

- 3 GIRLS SOCCER TEAMS (9TH, JV, VARSITY)
- 3 BOYS SOCCER TEAMS (9TH, JV, VARSITY)
- 3 FOOTBALL TEAMS (9TH, JV, VARSITY)
- 3 FIELD HOCKEY TEAMS (9TH, JV, VARSITY)
- 2 CROSS COUNTRY TEAMS ON TRACK

WINTER:

- 2 TRACK TEAMS, WEATHER PERMITTING

SPRING:

- 3 GIRLS LACROSSE TEAMS (ALL LEVELS)
- 3 BOYS LACROSSE TEAMS (ALL LEVELS)
- 2 OUTDOOR TRACK (VARSITY, JV)

UP TO 12 PRACTICES/GAMES EACH WEEKDAY TO SCHEDULE

Athletics at HS Turf Fields & Albemarle Sports Complex

Winter:

- Oxford Rd. Neighborhood soccer
- Juventus Boston
- Newton Area Flag Football League Clinic
- Newton Girls Soccer
- Newton Youth Soccer
- Boston Villa Soccer club
- BOH & Day Middle Schools
- General Park and School Field Users

Spring:

- B.A.T. Training
- Buda Youth Frisbee
- J. Lowe Soccer Camps (BC clinic)
- Newton Boys Lacrosse league
- Boston FHC (field hockey clinic)
- Newton Area Flag Football League Clinic
- Eastern Mass Women's Soccer (Suburban Thunder games)
- USA Track and Field New England – outdoor track
- Newton Special Athletes – outdoor track
- Newton Girls Soccer
- Newton Youth Soccer
- Over the Hill Soccer League
- Newton Girls Lacrosse League
- Prime – workouts
- Tanrikulu resident group
- Eastern mass Women's Soccer League
- Newton Little League
- Newton LL Seniors
- Senior Youth Baseball
- Newton Girls Softball
- F.A. Day Middle School Athletics;
- Prime Baseball League
- Babe Ruth Baseball Tryouts
- Adult Cricket
- Extra Innings Baseball Clinic
- BOH & Day Middle Schools
- General Park and School Field Users

Summer:

- Eastern Mass Women's Soccer (Suburban Thunder games)
- BUDA Youth Frisbee
- Boston FHC (field hockey clinic)
- Newton Community Ed summer sports clinics
- REV Lacrosse
- Newton Special Athletes – outdoor track
- Bertuzzi Soccer Training
- NN/NS Football Clinic
- North fall pre-season training and tryouts
- Newton Little League
- Babe Ruth Baseball
- Adult Cricket
- Newton Girls Softball
- Newton Community Ed – baseball
- Boys and Girls Club
- Extra Innings Baseball Clinic
- Mustang Youth Football
- American Legion Baseball
- Prime Baseball
- Juventas Youth Soccer
- BOH & Day Middle Schools
- General Park and School Field Users

Fall:

- Newton Mustangs (youth football)
- Endurance Youth Field Hockey
- Newton Boys Lacrosse League
- Newton Area Flag Football League Clinic
- Over the Hill Soccer league
- Eastern mass Women's Soccer League
- Newton Girls Soccer
- Newton Youth Soccer
- Newton Mustangs Football game
- Newton Little League
- Newton LL Seniors
- Adult Cricket
- Newton Girls Softball
- Mustang Youth Football
- F.A. Day Middle School Athletics
- Extra Innings Baseball Clinic
- Lasell Baseball
- NNHS Baseball captain's practice
- BUDA Youth Frisbee
- BUDA Adult Frisbee
- BOH & Day Middle Schools
- General Park and School Field Users

Synthetic Turf Replacements & Enhancement

- Synthetic turf field replacements at both high schools
 - NSHS First (Winkler Stadium & Brandeis Rd Field)
- Track resurfacing (NSHS)/replacement (NNHS) at both high schools
- Synthetic turf expansion at Albemarle (No Track)
- Standardize synthetic turf materials across all fields



NSHS WINKLER STADIUM (2023)



NSHS BRANDEIS RD FIELD (2023)



NNHS TIGER STADIUM (2024)



ALBEMARLE CRAFTS ST FIELD (2023-2024)

Expanding Play

- Synthetic turf fields:
 - Extended play into the winter months
 - Playable without snow cover in December, January, February & March
- Lighted synthetic turf fields:
 - Additional 3 hours of play per evening in fall and winter
 - Additional 1.5 hours of play per evening in spring and summer
 - Average Annual use expansion: 473 hrs (Based on NSHS Stadium Light Data)



NSHS WINKLER STADIUM LIGHTS (2020)



NSHS BRANDEIS RD FIELD LIGHTS (2022)



NNHS TIGER STADIUM LIGHTS (2023)



ALBEMARLE LIGHTS (2023-2024)



TOTAL LIGHTED SYNTHETIC TURF FIELDS:


- ALBEMARLE CRAFTS STREET MULTIPURPOSE FIELD
- NEWTON NORTH HS STADIUM TRACK & FIELD
- NEWTON SOUTH HS STADIUM TRACK & FIELD
- NEWTON SOUTH HS BRANDEIS RD FIELD

TOTAL: 4 FIELDS; 3 LOCATIONS

Newton Parks, Recreation and Culture Department
Athletic Fields Capital Improvement Plan

Newton High Schools Turf Replacements Project Goals

- Winkler Stadium, Brandeis Road Field and Tiger Stadium synthetic turf field replacement
 - Remove and recycle existing turf carpets
 - Remove and dispose of existing Crumb Rubber infill from recycled tires
 - Replace with better and cleaner turf carpet and infill
- Newton North and South track resurfacing
 - Evaluate and patch significant irregularities
 - Respray track surface over existing track
- Field collector drains cleaned



Winkler Stadium Track and Field

Brandeis Road Field

Project History

- Synthetic turf typically needs to be replaced about 8 - 10 years after installation.
- Rubberized track surfacing typically needs to be resurfaced about 8 - 10 years after installation
- Newton South HS synthetic turf fields and track: constructed in 2009 (13 yrs old)
- Newton North HS synthetic turf fields and track constructed in 2010 (12 yrs old)
- Fields are currently at their “end of life cycle”
 - repairs to extend lifespan of carpet are no longer effective

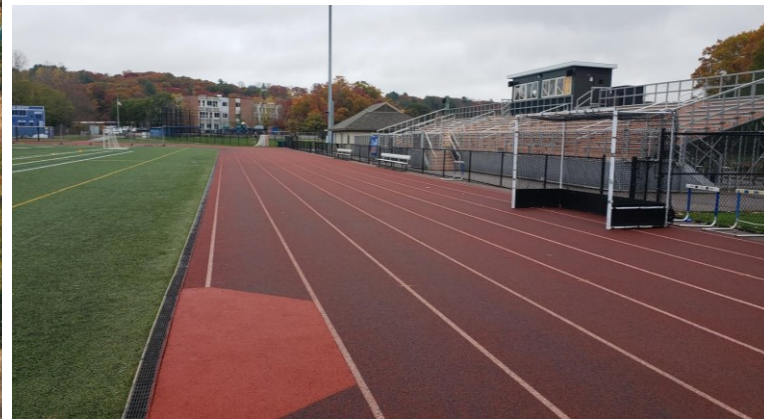
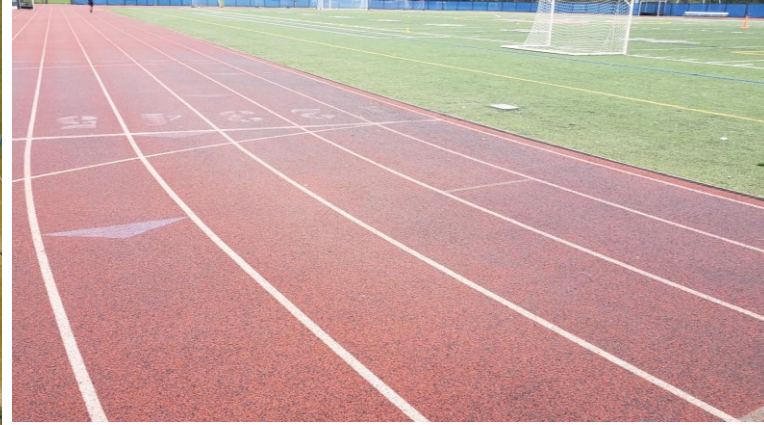
Existing Turf Photos



Existing Turf Photos



Existing Track Photos at NSHS



Product Research

- Interviews with Turf manufacturers
 - Shaw Sports
 - AstroTurf
 - Field Turf
- Review of synthetic turf system options for multi-purpose sports fields
 - Turf carpet
 - Infill materials (organic and non-organic)
 - Shock pads (when required)

Recap of Environmental Monitoring Report at NSHS Stadium

- Reviewed Environmental Monitoring Work in 2014 and testing
- Conservation Commission 2009 Order of Conditions and MassDEP Superseding Order of Conditions (#239-0590)
 - Perform stormwater monitoring for 5 years
 - Monitor crumb rubber migration for 18 months

Recap of Environmental Monitoring Report at NSHS Stadium

- 2013: Environmental consultant hired to:
 - Perform stormwater monitoring 3 times
 - Water samples tested for Cadmium, Chromium, and Lead
 - Elevated lead level was discovered once but not repetitive at one test port
 - Perform crumb rubber inspections
 - Crumb rubber was discovered in perimeter trench drain and catch basins adjacent to field
 - Crumb rubber was NOT discovered along fence line adjacent to the wetlands
 - Test groundwater in existing 300' deep irrigation wells
 - Zinc, Manganese, Barium, Lead, Chromium, Copper, Iron, and Cadmium were tested, and results were within MA guidelines

Final Monitoring Report Published in 2014

- The 2014 environmental report concluded that:
 - The crumb rubber collection drain system was working properly
 - The synthetic field had no impact on groundwater quality
 - No further testing was required

Synthetic Turf Field Surfaces and Materials Selection Based on a Balanced Approach



Longevity

- Life Span and Warranty
- Quality of Carpet
- Quality of Infill
- Minimal Infill Replenishing



Maintenance

- Annual Maintenance
- Minimal Infill Displacement
- Minimal Large-Scale Repairs
- Reduced field marking labor



Player Safety in Turf

- Consistency in GMAX Rating
- Heat Index
- Toxic Chemical Exposure
- Freezing Conditions
- Consistency in Head Injury Criterion (HIC) Rating



Environmental Impacts

- Minimal Infill Displacement into waterways
- Cleaner Materials
- No need for Watering
- Future End-of-Life Disposal
- PFAS Exposure



Playability

- Playability
- Shock Absorption
- Minimal Disruption to Use
- Extended Seasonal Use
- Retain Newton Athletic Competitive Edge

Infill Material Comparison

	Product	Pros	Cons
Non-Organic	SBR (Crumb Rubber Recycled Tires)	<ul style="list-style-type: none"> • Most widely used • Durability / Longevity • No irrigation required • Reduced migration of material • Reduced maintenance 	<ul style="list-style-type: none"> • Elevated heat levels • Environmental / health concerns • Moderate displacement
	EPDM (Post Industrial Recycled Rubber)	<ul style="list-style-type: none"> • Durability / Longevity • No irrigation required • Reduced migration of material • Reduced maintenance 	<ul style="list-style-type: none"> • Elevated heat levels • Moderate displacement
	EPDM (Virgin Rubber)	<ul style="list-style-type: none"> • Durability / Longevity • No irrigation required • Reduced migration of material • Reduced maintenance 	<ul style="list-style-type: none"> • Elevated heat levels • Increased cost
	Thermo Plastic Elastomer (TPE)	<ul style="list-style-type: none"> • Reduced heat levels • No irrigation required • Reduced maintenance • Reduced migration of material • Most Durable 	<ul style="list-style-type: none"> • Higher cost over crumb rubber (SBR) • Manufactured product
Organic	Cork and Coconut Mixture	<ul style="list-style-type: none"> • From naturally materials • Reduced heat levels 	<ul style="list-style-type: none"> • Increased maintenance (replenish) • Reduced seasonal play (freezing) • Requires shock pad • Irrigation recommended • Increased material displacement
	Cork	<ul style="list-style-type: none"> • From naturally materials • Reduced heat levels 	<ul style="list-style-type: none"> • Increased maintenance (replenish) • Reduced seasonal play (freezing) • Requires shock pad • Irrigation recommended • Increased material displacement
	Southern Pine	<ul style="list-style-type: none"> • From naturally materials • Reduced heat levels 	<ul style="list-style-type: none"> • Increased maintenance (replenish) • Reduced seasonal play (freezing) • Requires shock pad • Irrigation recommended • Increased material displacement
	Acrylic Coated Sand	<ul style="list-style-type: none"> • Reduced heat levels • Durable • Reduced migration of material 	<ul style="list-style-type: none"> • Increased maintenance (replenish) • Increased cost • Abrasive and firm

Nearby Communities with Synthetic - Infill Materials

Facilty Name	Town	Infill Material	Year installed
Tantasqua Regional High School - Fields 1 & 2	Town of Sturbridge	Organic	2016
Sprague Fields & Hunnewell Stadium	Town of Wellesley	TPE	2016
North Quincy High School	City of Quincy	Crumb Rubber	2016
Pembroke High School	Pembroke Public Schools	Rubber/Sand	2017
Lunenburg High School	Town of Lunenburg	Crumb Rubber	2017
Weston High School	Town of Weston	Rubber/Sand	2017
Watkins Field Replacement	City of Gardner	Crumb Rubber	2018
Tyngsborough High School	Tyngsborough Public Schools	Organic	2018
Cutting Field - Town of Sudbury	Town of Sudbury	Crumb Rubber	2018
Hopkington HS/MS Field	Town of Hopkington	Coated Sand	2019
De Fazio and Memorial Fields	Town of Needham	Crumb Rubber	2019
North Middlesex Regional High School	Town of Townsend	Crumb Rubber	2019
Harry Downes Field	Town of Brookline	Organic	2019
Dana Hall	Town of Wellesley	EPDM	2020
Conway Park	City of Sommerville	Organic	2022

Infill Material Comparison

	ORGANIC INFILL	TPE INFILL
Playability	High	High
Player Safety	Shock pad required; infill migration compromises GMAX ratings	No shock pad required; consistent GMAX ratings
Durability	10% infill replacement every 2-3 years (\$15,000)	Replacement not typically required
Environmental Impacts	No known impacts; shock pad installation; water usage; increased material migration into adjacent areas	No known impacts; manufactured product
Maintenance	Semi-annual grooming (\$10,000)	Semi-annual grooming (\$10,000)
Replacement	8-10 years plus infill replacement	8-10 years, minimal to no infill replacement
Infill Cost	\$120,000 for an 80,000 sf field (similar size to both Newton HS stadiums)	\$240,000 for an 80,000 sf field (similar size to both Newton HS stadiums)
Heat Index	40-50 degrees cooler than crumb rubber	10 degrees cooler than crumb rubber
Play Limitations	Late Fall, Early Spring; Seasonal susceptibility due to freezing	None

Recommended Synthetic Turf Field Surfaces and Materials Selection Based on a Balanced Approach

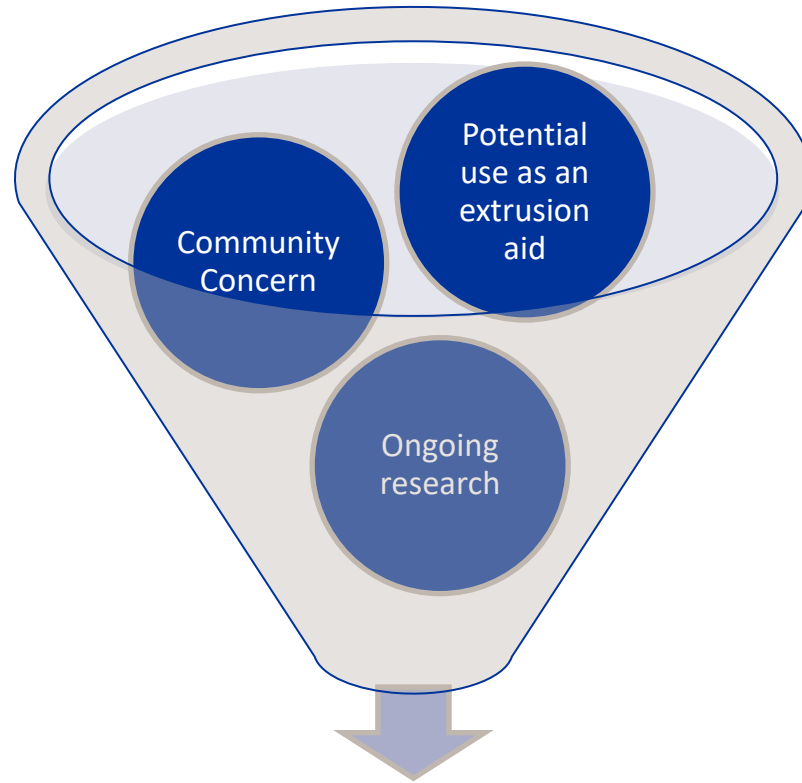
- Turf Carpet:
 - Dual Fiber Turf: Slit Film + Monofilament
 - Fiber height: 2.25"-2.5" to ensure GMAX values
 - Appropriate for: Soccer, Football, Lacrosse, Field Hockey and more!
 - Infill Flyout and Displacement Control
- Infill Mix:
 - TPE + Sand
 - No material Migration
 - Retains consistent GMAX ratings
 - Reduced heat levels compared to Crumb Rubber
 - Minimal annual replenishing required at center field and goals
 - Less susceptible to freezing

Per- and Poly-fluoroalkyl Substances (PFAS)

- What are PFAS?
 - Large class of man-made chemicals that contain fluorine
- Why is PFAS in the news?
 - Studies suggest potential for adverse health effects at high levels of exposure
- Where are PFAS found?
 - PFAS are used in many consumer products
 - Slow to break down in the environment



<https://www.epa.gov/sites/default/files/press/img/RFU%20Products%20Containing%20PFAS.jpg>



Interviews with leading turf companies

Next Steps

- Provide Update to City Council Programs & Services Committee on Nov. 9th, 2022
- Finalize Project budget for NSHS Fields
- Permit the work at Newton South HS Stadium with the Newton Conservation Commission (Dec. 2022 Thru Jan. 2023)
- Docket funding request with city council for construction funding for both HS projects (Dec. 2022 Thru Jan. 2023)
- Purchase materials and procure installation labor for NSHS (Feb. 2023)
- Award NSHS installation contract
- Begin NSHS construction at end of school year



Thank you for attending!

For more information, please contact us at: Athleticfields@newtonma.gov Or visit us at newtonma.gov/parkprojects