Wayland
Massachusetts

Public Information Meeting
Natural Grass and Synthetic Turf Field Systems
September 12, 2017

Introductions

- Gene Bolinger, Weston & Sampson
- Mike Moonan, Weston & Sampson
- Cass Chroust, Weston & Sampson
- Marie Rudiman, Weston & Sampson

Purpose of Today's Meeting

- Brief update on the Town-wide Recreation Facilities Strategic Plan
- Discuss the pros + cons of natural grass and synthetic turf field systems in light of existing conditions and pressures on Wayland's athletic facilities

How We Got To Where We Are Today

- Construction of existing high school synthetic turf field: 2007
- Prior studies and recommendations
- 2016 Open Space + Recreation Plan Update
- High School Master Plan
- Town-wide Recreation Facilities Strategic Plan
- Critical needs | town-wide field shortage
- Fall 2017 Town Meeting
- Continuing design, permitting and public outreach process

The High School Master Plan

- Existing fields and user groups
- Existing conditions of athletic facilities
- Current High School Master Plan draft
- The stadium complex and field

The High School Master Plan – Existing Fields and All User Groups

The High School Master Plan – Current Draft of HS Master Plan

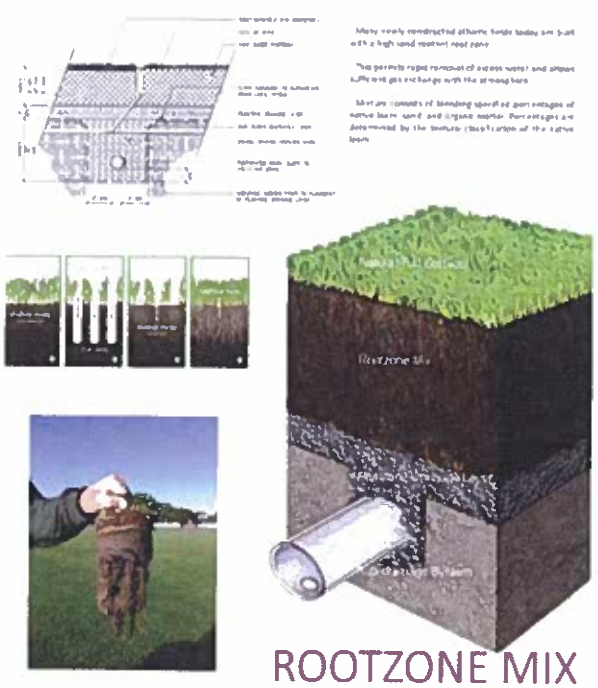
The High School Master Plan – Stadium Complex and Field

Natural Grass Compared to Synthetic Turf

NATIVE SOIL ROOTZONE

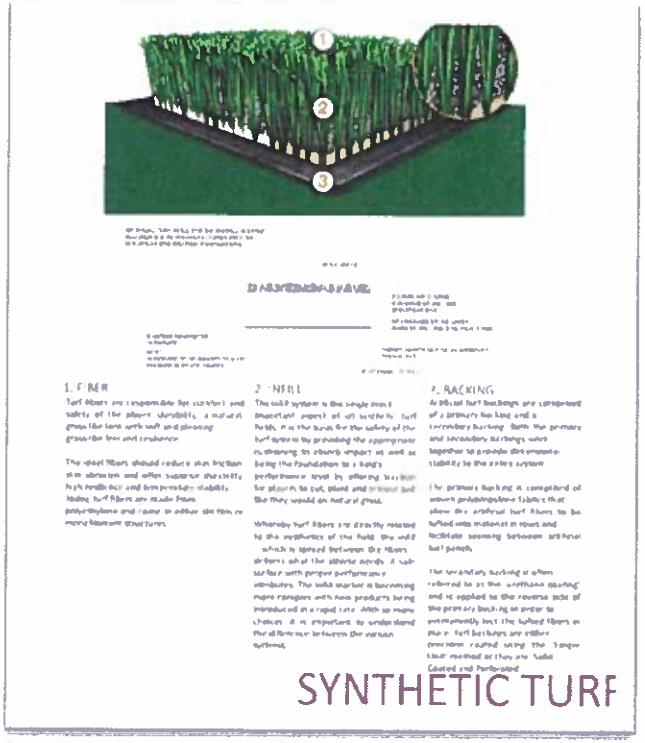
NATURAL SOILS

SAND BASED ROOTZONE



ROOTZONE MIX

TURF SYSTEM



SYNTHETIC TURF

Meeting Agenda

- Purpose of today's meeting
- How we got to where we are today
- Town-wide Recreation Facilities Strategic Plan
- High School Master Plan
- Synthetic turf compared to natural grass
- Discussing community concerns
- Recommended field improvement
- Open discussion | Q + A

Natural Grass Compared to Synthetic Turf

	Native Soil Natural	Sand Based Natural	Synthetic Turf
Initial Construction Cost	$500,000	$750,000	$1,100,000
Annual Maintenance Cost	$25,000	$30,000	$10,000
Replacement Cost After 12 Years	$85,000	$85,000	$450,000
Life-Cycle Cost over 12 Years	$885,000	$1,195,000	$1,670,000
Hours of Recommended use per Year	100 to 200	350 to 600	3,000+
Average Cost per Hour of Use per Year	$369	$166	$46

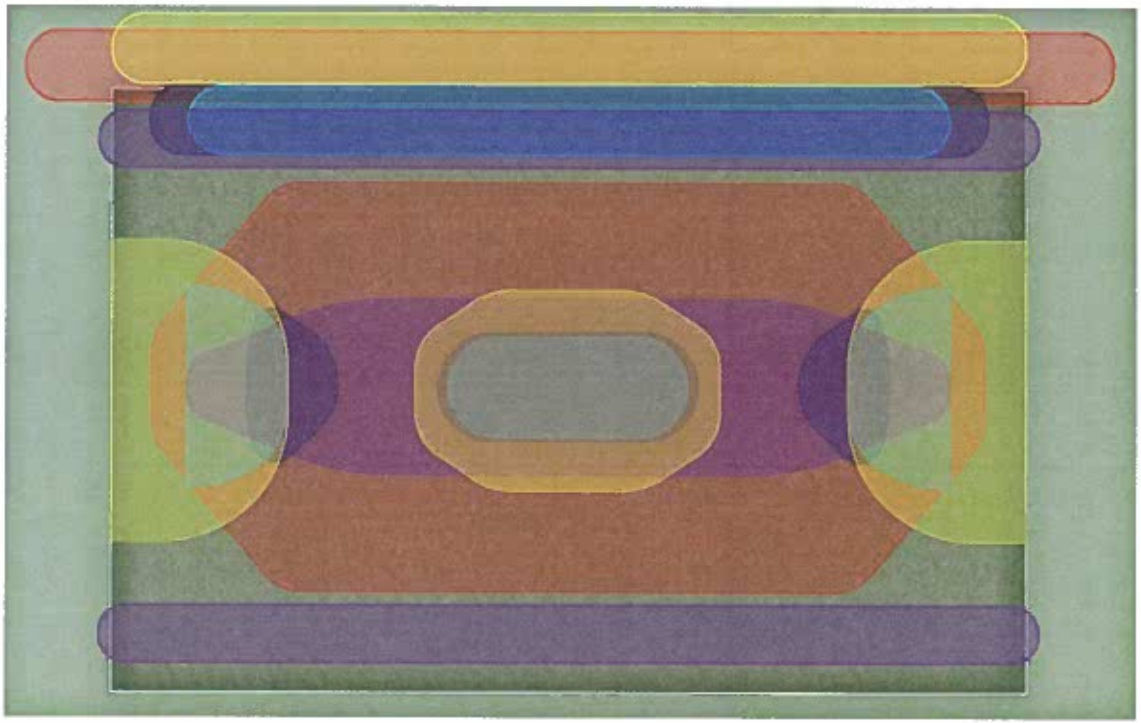
Conclusions:

*Figures based on a field with an area of 93,000 square feet (360' x 225')

-Native Soil Field – less playing time available
-Sand Based Natural Field – less playing time available
-Synthetic Turf Field – most playing time available; BEGIN alleviating critical field shortages

Natural Grass Compared to Synthetic Turf

NATURAL TURF WEAR



SOCCER RUGBY FOOTBALL LACROSSE FIELD HOCKEY

Average Multi-Use Field (240'x360') | Field Wear & Tear Zone: 62% | Sideline Wear & Tear Zone: 32,300 SF

Natural Grass Compared to Synthetic Turf

Pro's and Cons for Natural Turf Fields:

- Initial Cost - Cheaper to construct and replace/re-sod.
- Playability can be limited by weather.
- Higher maintenance costs
- Limited Playing Time - It is recommended that higher performing natural fields are only played on for 350-600 hours or less per year.
- Environment impacts

Pro's and Cons for Synthetic Turf Fields:

- Higher Initial Cost – More expensive to build, repair and replace.
- More Playing Time - Can support higher intensity of use and can extend the playing season.
- Less intensive maintenance program
- Fewer Injuries due to even playing surface and consistent G-max performance
- Potential heat hazards

Natural Grass Compared to Synthetic Turf

Synthetic Turf Field Infill Options

Rubber | Plastic	Natural | Organic	Minerals/Coated Minerals
Wide use, best performance + resiliency	Organic	Longest life before replacement
Some recycled	Prone to migrating, more maintenance	Less resiliency, harder surface
Perception of toxicity	Requires shock pad, higher cost	Requires shock pad, higher cost
Heavy metals in trace amounts, not releasable	Moisture required to retain resiliency, can freeze	Can be abrasive
Shock pad required with some products	May contain pesticides, heavy metals in trace amounts that are releasable	

Discussing Community Concerns

Marie Rudiman (Weston & Sampson)

Human Health Risk Assessor/Toxicologist

- Northeastern University | Toxicology
- Experience: 23 Years
- Focus: Evaluate chemicals to determine if they cause an unacceptable/acceptable risk to human health using Federal (EPA) and State (DES/DEP) regulations and guidance

Discussing Community Concerns

Risk = Exposure x Toxicity

- Bioavailability of chemicals in synthetic turf fields
- We will analyze proposed crumb rubber prior to installation
  - Metals
  - Benzothiazole
  - PAHs, SVOCs
  - VOCs
- Ways we looked at available data to determine if the risks are acceptable
  - Comparison to applicable standards
  - Ingestion of crumb rubber particles (CRP)
  - Dermal contact with CRP and turf bed
  - Inhalation of chemicals that may volatilize from the synthetic field
  - Leaching of chemicals into groundwater
- We will evaluate data we collect from proposed fields in the same manner

Discussing Community Concerns

Comparison to Applicable Standards

Constituent	Maximum Detected Concentration mg/kg	ASTM (American Society for Testing and Materials) F3188-16 Safety of Toys mg/kg		European Standard EN 71-3 Category III Safety of Toys mg/kg	
Metals					
Aluminum	68	70,000	Pass	70,000	Pass
Barium	6	18,750	Pass	18,750	Pass
Boron	9	15,000	Pass	15,000	Pass
Cobalt	1	130	Pass	130	Pass
Copper	5	7,700	Pass	7,700	Pass
Manganese	8	15,000	Pass	15,000	Pass
Nickel	2	930	Pass	930	Pass
Strontium	10	56,000	Pass	56,000	Pass
Titanium	5	NA		NA	
Zinc	1,080	46,000	Pass	46,000	Pass

Discussing Community Concerns

Comparison to Soil Background

Constituent	Maximum Detected Concentration in Crumb Rubber mg/kg	Soil Background Concentrations from Massachusetts 90th Percentile mg/kg	
Metals			
Aluminum	68	10,000	
Antimony	4	1	
Barium	6	50	
Boron	9	Not Determined	
Cadmium	0.53	2	
Chromium(III)	1.7	30	
Cobalt	120	4	*
Copper	27	40	
Lead	26	100	
Manganese	8	300	
Molybdnum	2	Not Determined	
Nickel	34	20	*
Strontium	10	Not Determined	
Titanium	5	Not Determined	
Vanadium	0.84	30	
Zinc	14,000	100	*

Discussing Community Concerns

Evaluation Through Risk Assessment

Risk Assessment is a way to estimate potential health risks from exposure to chemicals

Risk = Exposure x Toxicity

Conclusion: Potential Risks are an Acceptable Exposure/Negligible Exposure

- Residential Receptor
- Age 1 through 31 years
- 30 year exposure

Discussing Community Concerns

Conservative Risk Assessment Assumptions

- Maximum detected concentrations were used
- Subchronic exposure (1 yr old) 2 days/wk/30 weeks
- Chronic exposure 3 days/wk/30 weeks
- Exposure through ingestion and dermal contact
- Ingest 100 mg/kg crumb rubber on each day of exposure
- Crumb rubber sticking to face, forearms, hands, lower legs and feet
- Assumes crumb rubber can be ingested like soil and adheres to skin like soil. Reality: far less exposure!

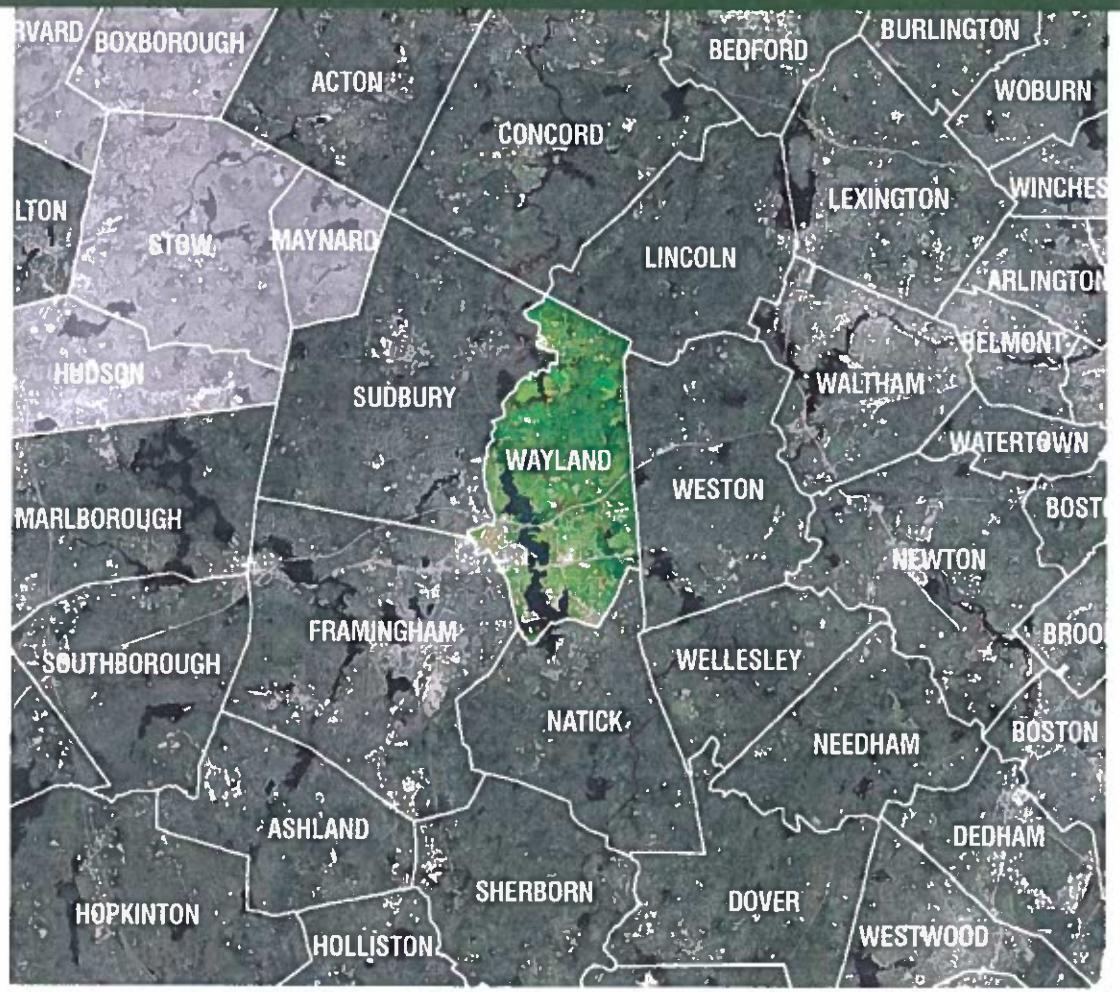
Recommended Stadium Complex + Field Reconstruction Approach

SYNTHETIC TURF FIELD

- Replace existing turf field system
- Improvements in synthetic turf field systems since last turf system constructed in 2007
- Eases critical rectangular field shortages
- Performs at a high level
- Reduces impacts to other natural turf fields
- Accommodates high impact sports
- Accommodates school and community uses
- Maximizes periods of usage
- Drainage characteristics limit storm impacts to use

Recommended Stadium Complex + Field Reconstruction Approach

Neighboring Communities with Synthetic Turf Fields



Open Discussion | Q + A

THANK YOU!!

Questions | Comments | Discussion