



Proposal Response for
Elizabethtown Area School District
Athletic Facilities Master Plan

Prepared by:



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Executive Summary

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1.A Executive Summary

In the Fall of 2022, the School Board for the Elizabethtown Area School District (EASD) requested a feasibility study be conducted on the District’s athletic facilities. The scope of the study included athletic fields and outdoor facilities located on the High School / Middle School / Elementary School Campus. ELA Sport. was contracted to guide the work, inclusive of project base mapping, site investigation, schematic design, and master planning, and conducting programming and planning with School District staff.

1.B Project Goals

To develop a comprehensive master plan for EASD’s athletic fields and facilities that will:

- Identify the proper number of fields and facilities needed to accommodate current and future athletic programs
- Account for equity amongst facilities, in accordance with Title IX.
- Identify potential safety issues with the fields and facilities and ways to address those items.

1.C Key Insights

Grandstands:

- Current visitor grandstands at Thompson Field does not provide ADA accessibility. Any renovations to the structure must include ADA modifications as well.

Fields:

- Thompson Field: Stadium facility with the largest seating capacity and lights; primarily a game only facility with low number of events to keep field in best condition possible but lack of use places pressure on other fields for usage; has irrigation but no subdrainage; based on calculations shown in this report consideration should be made for synthetic turf to address event needs for District sports; grass field is in fair / good condition but if retained consideration should be made to do major reconstruction to install subdrainage, possible in-ground irrigation, proper crown, and drainage to maximize durability as best as possible ; ADA access from East High Street is needed for visitor’s side and Jane Hoover Field; number of bathrooms do not meet code requirements.

Running Track: Paving for the track is at end of normal life expectancy as is track surfacing so reconstruction / replacement is recommended. Would set size to optimize field to provide optimal usage to many District teams as possible.

- Jane Hoover Field: Secondary stadium with synthetic turf, seating and lights; turf currently near end of life cycle and will need to be replaced; heavily used; ADA access should be improved and bathroom facilities provided.
- Baseball Fields: Moderate renovations to the field (including infield) suggested; varsity dugouts require replacement; add irrigation to JV Field (which already exists on the Varsity field); no subdrainage; ADA access should be provided.
- Fields 1 through 4: Field grading on all fields is either to one end or side which concentrates runoff in one area leading to potential wet unplayable conditions; no irrigation or subdrainage so recovery not to capacity
- Jr High Football Practice Field: Undersize field primarily used for practice; enhanced maintenance to help recovery is suggested.
- Church Field
 - Being this field is owned by others renovation options are limited; funds for any work on this field is recommended to be used on District owned fields.

Paved Facilities

- Tennis Courts:
 - Constructed in 2013 so paving is roughly halfway through its life cycle; surfacing should be monitored and repaired as needed. A resurfacing will be needed prior to reconstruction.

1.D Key Recommendations

Recommended Athletic Facility Improvements – High School / Elementary School Campus

Based on the inventory of the existing fields on the campus and Field Use Analysis the following are the suggested improvements for each facility.

Note – For Natural Grass Fields the Following Apply:

- Major Renovations – Multiple aerations, topdressings, dragging and rolling to even the field surface.
- Moderate Renovations – Limited aerations, topdressings and dragging.
- Minor Renovations – Address compacted or damaged areas.
- Reconstruction – Includes kill existing grass, till, regrade and sod. Irrigation and subdrainage an additional option.

Item No.	Field / Sports	Recommended Improvements / Alternatives
1	Thompson Field (Option 1)	<ol style="list-style-type: none"> 1. Synthetic Turf Field w/ Wider Track to Allow Full Size Soccer. 2. Reconstruction of running track and jumping venues. Establish 1 meter to fence around track (recommended). 3. Relocate and renovate visitors grandstand to include ADA. 4. ADA access from East High Street. 5. Improve access around track. 6. Fieldhouse
2	Thompson Field (Option 2)	<ol style="list-style-type: none"> 1. Same as Option 1 with existing field and track to remain as currently configured. Access and 1 meter clearance improvements may be limited on the home side.
3	Thompson Field (Option 3)	<ol style="list-style-type: none"> 1. Reconstruction to natural grass field including irrigation and subdrainage. 2. Reconstruction of running track and jumping venues. Establish 1 meter to fence around track where possible (recommended). 3. Relocate and renovate visitors grandstand to include ADA. 4. ADA access from East High Street. 5. Improve access around track where possible. 6. Fieldhouse
4	Jane Hoover Field	<ol style="list-style-type: none"> 1. Replace synthetic turf in near future. 2. ADA access from East High Street if not done as part of Thompson Field project.
5	Varsity Baseball	<ol style="list-style-type: none"> 1. Moderate Renovations 2. New dugouts. 3. ADA access to ball fields
6	JV Baseball	<ol style="list-style-type: none"> 1. Moderate Renovations
7	Field 1	<ol style="list-style-type: none"> 1. Moderate Renovations
8	Field 2	<ol style="list-style-type: none"> 1. Moderate Renovations
9	Field 3	<ol style="list-style-type: none"> 1. Moderate Renovations
10	Field 4	<ol style="list-style-type: none"> 1. Moderate Renovations
11	Jr High Football Practice	<ol style="list-style-type: none"> 1. Minor Renovations / Enhanced Maintenance
12	Church Field	<ol style="list-style-type: none"> 1. Minor Renovations / Enhanced Maintenance
13	Tennis Courts	<ol style="list-style-type: none"> 1. Monitor Surface Conditions – Repair as Needed 2. Paving and surface replacement likely in 10 years.

Phasing of Recommended Work

Phase 1 – Address Shortage of Multi-Purpose Fields

The biggest need on the Campus is for multi-purpose fields.

- Thompson Field Renovation
- Jane Hoover Field Renovation – Synthetic Turf Replacement

Phase 2 – Address Remedial Work on Ballfields

All ballfields have evidence for the need of remedial work.

- Varsity Baseball Field Renovations
- Junior Varsity Baseball Field Renovations

Phase 3 – Address Remedial Work on Multi-Purpose Fields

Need to do repair work on all multi-purpose fields.

- Moderate Renovations
- Minor Renovations / Enhanced Maintenance

Fieldhouse

Currently, there are limited facilities in the area of Thompson and Jane Hoover Field. The School District Administration team and their architects (CRA) have identified the lack of these facilities in close proximity to the existing fields as a deficiency to meet the current demands from the students and community engagement. The consolidation of events by doing “Recommendation 1” is significantly going to add to this deficiency and increase demand for facilities such as restrooms, locker space, trainers' room, and other associated spaces. Historically in this process, ELA Group, Inc. is tasked with focusing their efforts on the fieldwork, as this is our area of expertise. With that said, we have worked with the School District Administration and CRA to assist in the conceptual design of a field house reflecting on our extensive experience with other school districts. In doing so we recognize the final needs and detailed designs are more in-line for Elizabethtown Area School District and CRA to develop. CRA will be referencing in their Design Narrative the aspects of the field house.

The “Concept A” drawing of “Recommendation 1” with associated Fieldhouse is located in the “Appendix” section of this Executive Summary.

2 Introduction and Background

- ◇ Introduction
- ◇ Background
- ◇ Campus Athletic Programs and Sports Field Overview
- ◇ Athletic Program Growth and Sports Field Demand
- ◇ Study Purpose and Goals
- ◇ Potential Growth/Decline in Sports Programs/Participation



2A. Introduction

Athletics are recognized as a vital component in the educational and extracurricular programs provided within school systems at both the primary and secondary grade levels. Not only do athletics provide opportunities for physical fitness, they inspire teamwork, promote sportsmanship, build a competitive spirit, and instill a sense of pride that can extend from the school to the community.

The intent of this Study is to review conditions of outdoor athletic facilities at the High School / Elementary School campuses. These findings are inventoried, facility usage analyzed then remedial steps recommended with budgetary estimates provided:

2B. Background

High School / Middle School / Elementary School Campus

The Campus consists of approximately ±89 acres located in the northern part of the Elizabethtown Borough, Lancaster County, PA. The schools on the Campus include the Elizabethtown Area High School, Middle School and the East High Street Elementary. Throughout the property lies five (5) full size and one (1) undersized natural grass multi-purpose field, two (2) baseball fields, an all-weather running track, running and throwing venues, and a battery of six (6) tennis courts. An additional field, called Church Field, is located across the street and is leased to the District. The main stadium facility and Jane Hoover Field are the only fields with both proper field lighting and permanent seating. The former has a home side grandstand with press box, visitor grandstand, ticket booths and separate concession/ maintenance building. The latter has a single grandstand. With some exceptions, the grass fields are in fair to good shape with a limited maintenance program in place. The tennis courts are in good shape being resurfaced in 2013. The track was last fully surfaced sometime prior to 2013 and is in need to be replaced from the bituminous surface on up.

2C. Campus Athletic Programs and Sports Field Overview

High School / Middle School / Elementary School Campus

The District has twelve (12) high school and seven (7) middle school teams participating in outdoor sports on the seven (7) multi-purpose fields on campus as well as the “Church” Field located across East High Street making for a total of eight (8). These fields are used for both girls’ and boys’ teams for soccer and lacrosse, field hockey, football and marching band. There are other teams that use dedicated facilities including boys and girl track, tennis, cross country as well as baseball and softball fields.

Practices and competition for all fall and spring field sports with the exception of softball occur on athletic fields and facilities located at the campus.

2D. Athletic Program Growth and Sports Field Demand

As with many of the area school districts, enrollment growth has not only resulted in an increased demand on the existing educational facilities, but on the existing athletic facilities as well. The typical school enrollment increase normally leads to greater participation in competitive sports, a generally larger number of athletic programs being offered, and an increase in the number of students participating in athletic programs at all grade levels.

As demand and usage on the fields increase, so does the chance for field condition deterioration over time, resulting in inconsistent turf cover, marginal surface conditions, limited turf recovery, and other conditions that not only affect playability, but may also pose potential hazards to the participants. These impacts are the result of the field use exceeding the baseline maximum use that the cultural and physical characteristics of that field can reasonably tolerate. A higher quality of construction (irrigation/subdrainage) and more intensive maintenance programs create a premier facility and can help increase the baseline for maximum use and reduce turf stress. However, turf wear and deterioration should be expected and is common for all “high use” facilities, such as public recreation facilities, schools, and municipal parks, regardless of the quality of construction and extent of maintenance. The distinct advantage of quality construction and good maintenance practices is an increase in the effectiveness of field maintenance, leading to shorter recovery periods and more complete turf regeneration.

Public schools, municipal agencies, and public recreation organizations tend to face similar challenges of demand exceeding supply. The development of new athletic fields, or “high quality athletic fields”, may also be influenced by limited or fixed funds available for construction and ongoing maintenance practices. Often a School District may not even have a premier natural turf field due to budgetary constraints or other limitations. The concern with natural turf is even the most carefully maintained field can be severely damaged if used when conditions are wet and the field saturated.

2E. Study Purpose and Goals

The primary goal of this study is to provide the Elizabethtown Area School District with recommendations that will enable them to provide the proper number of sports fields and facilities that are sized appropriately to accommodate the existing athletic programs and their future growth, while maintaining a level of field quality that is both safe and suitable for practice and competitive play.

Fields

This Athletic Field and Facility Master Plan includes an evaluation of all of the existing sports fields located on the High School / Middle School / Elementary School Campus. This evaluation considers the quality and condition of the athletic fields based on two (2) primary factors. These include physical factors, and factors related to the type and intensity of field use. Physical factors are those such as surface drainage, field grading/surface contour, construction quality and methods, and soil compaction.

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Use factors are those associated with the intensity, type, or other user-based practices with result in excessive wear and turf stress and limits turf recovery on natural grass fields.

In order to realize the stated goal, this master plan will consider the facility needs, potential improvements as determined by the School District, and the expansion of athletic facilities to meet the growing demand in a single planning document while developing short- and long-range planning goals and implementation strategies for the District's consideration. The scope of the study will also consider the following:

- Visual inspection of each field to determine turf quality, physical characteristics (such as surface drainage, field slope, upslope drainage, compaction, and size) as well as general observations regarding the field condition.
- Identify the current usage type(s) and intensity of use (number of practices, games, or other "events") for each field.
- Identify and establish an approximate baseline for maximum use based upon the intensity/type of field use, current condition, method of field construction, and maintenance practices.
- Develop alternatives (options) to address conditions leading to field deterioration and enhance turf recovery, including field use and maintenance practices, reconstruction and renovation of existing facilities, construction of additional (new) facilities, and consideration of synthetic turf athletic field surfacing.

Hardscape Facilities

The other athletic facilities we inspect are tennis courts running tracks, and track and field venues. These facilities normally consist of some type of paving with or without surfacing that has a limited life requiring reapplication or replacement to repair. Depending on age of the venue, the base paving may be failing requiring more extensive repairs.

The study has been developed based primarily upon the following:

- Meetings and conversations with District administrative and athletics staff and information provided by these parties regarding field use, maintenance program, and assignments for athletics, physical education, and community use;
- Site inspection/review of the athletic fields and facilities at the high school;
- Review of District field use practices, primarily related to scheduled field assignments, including type of sport/program and number of scheduled events (games and practices);
- Previous experience with athletic field construction, maintenance practices, and field use.

2F. Potential Growth/Decline in Sports Programs/Participation

Introduction

To determine the five-year participation trends locally, statewide, and nationwide, ELA researched two sources. We obtained local data from the Athletic Director, while the state and national data is from the National Federation of State High School Associations (NFHS), of which PIAA is a member. In all three databases there are some fluctuations from year to year where participation may have increased/decreased one year to only go back the next year to the original number two years prior. Our goal is to discover any long-term trends to identify the sports that are growing or declining. Please note that NFHS and PIAA were unable to collect participation records for 2019/2021 due to the COVID-19 pandemic.

Boys Sports – Table 1

School Sports - Annual Participation / Number of Students Nationally						
	2016/17	2017/18	2018/19	2019/21¹	2021/22	TREND²
Baseball	491,790	487,097	482,740		481,004	-1.8%
X-Country	266,271	270,095	269,295		231,387	1.1%
Football	1,057,382	1,036,842	1,008,417		973,792	-4.6%
Lacrosse	111,842	113,313	113,702		107,865	1.7%
Soccer	450,234	456,362	459,077		436,465	2.0%
Tennis	158,171	158,151	159,314		145,858	0.7%
T&F Indoor	82,172	80,754	79,550		65,316	-3.2%
T&F Outdoor	600,136	600,097	605,354		569,262	0.9%
School Sports - Annual Participation / Number of Students in Pennsylvania						
	2016/17	2017/18	2018/19	2019/21³	2021/22	TREND⁴
Baseball	21,280	21,152	21,024		20,704	-1.2%
X-Country	11,460	11,440	11,440		11,560	-0.2%
Football	25,740	25,605	25,515		25,020	-0.9%
Lacrosse	6,624	6,656	6,688		6,592	1.0%
Soccer	20,125	20,265	19,845		19,740	-1.4%
Tennis	4,572	4,572	4,428		4,320	-3.1%
T&F Indoor	2,580	2,560	2,580		2,745	0.0%
T&F Outdoor	24,320	24,320	24,320		24,280	0.0%

¹ No Numbers Gathered Due to COVID-19 Pandemic

² Does Not Include the 2021/22 Numbers. Those numbers are inserted for comparison purposes only

³ No Numbers Gathered Due to COVID-19 Pandemic

⁴ Does Not Include the 2021/22 Numbers. Those numbers are inserted for comparison purposes only

Boys Sports – Table 1 (Cont.)

School Sports - Annual Participation / Number of Students at EASD							
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	TREND
Baseball	32	31	34	35	31	33	3.1%
X- Country	41	44	36	43	39	36	-12.2%
Football	101	97	89	105	87	83	-17.8%
Lacrosse	39	38	36	40	31	28	-28.2%
Soccer	61	68	70	68	72	67	9.8%
Tennis	12	19	20	14	16	19	58.3%
T&F Indoor	0	0	13	23	1	26	0.0%
T&F Outdoor	78	81	69	64	50	76	-2.6%

National (2016 to 2022)

- Soccer is the largest growing sport with an increase of 2% with lacrosse a close second at 1.7%.
- Largest drop in participation is football at 4.6% with indoor track & field next at 3.2%.
- Although falling in participation, football by far is the largest participatory sport with nearly 1 million participants. The next largest is track and field with 605,354 student athletes.
- Participation numbers for post COVID are all lower than the 2018/19 numbers. This should see an increase as things return to normal.

Statewide (2016 to 2022)

- Only one sport is growing which is Lacrosse at 1%.
- Largest drop in participation is tennis at 3.1% with soccer next at 1.4%.
- Although falling in participation, football is the largest participatory sport with nearly 25,515 participants. The next largest is track and field with 24,320 student athletes.
- Participation numbers for post COVID are mostly slightly less with some higher showing better recovery than nationwide.

Elizabethtown Area School District (2016 to 2022)

- What is interesting is the District experienced rather steady numbers through the pandemic compacted to National and State information.
- Three sports had double digit percentage drops (Lacrosse 28.2% / Football 17.8% / Cross Country 12.2%)
- Tennis had a significant jump in participation of 58.3%, while soccer (9.8%) and Baseball (3.1%) are the only other sports that went up over the six year span.
- For the most part, the participation in all sports appears to have increases followed by decreases that somewhat average out over time. No sport appears to be steadily increasing nor decreasing. Baseball is the one where the number of students is fairly consistent.

Summary

- At the local school level, varsity sports tend to fluctuate in numbers of participants for a variety of reasons. This includes, but is not limited to, class size, number of athletes, team success, and coaches and peer involvement. Looking at both state and nationwide statistics will provide a better idea of how the sport is doing demographically.
- There are three (3) sports dropping nationally with football being the most significant at 4.6%. This is likely based on concerns with concussions and injuries, which have increased in recent years.
- Statewide there are five(5) sports trending downward with the most significant being tennis.
- As for the District, the sports that are contrary to National/State trends and Lacrosse (drop vs. rise), and Baseball (rise vs. drop).

Girls' Sports – Table 2

School Sports - Annual Participation / Number of Students Nationally						
	2016/17	2017/18	2018/19	2019/21 ⁵	2021/22	TREND ⁶
Cross Country	226,039	223,518	219,345		191,323	-3.0%
Field Hockey	60,549	59,856	60,824		55,829	0.5%
Lacrosse	93,473	96,904	99,750		96,762	6.7%
Soccer	388,339	390,482	394,105		374,773	1.5%
Softball	367,405	367,861	362,038		340,923	-1.5%
Tennis	187,519	190,768	189,436		176,185	1.0%
T&F Indoor	72,422	72,662	70,703		61,109	-2.4%
T&F Outdoor	494,477	488,592	488,267		456,697	-1.3%
School Sports - Annual Participation / Number of Students in Pennsylvania						
	2016/17	2017/18	2018/19	2019/21 ⁷	2021/22	TREND ⁸
Cross Country	11,380	11,500	11,500		11,600	1.1%
Field Hockey	9,800	9,800	9,625		9,310	-1.8%
Lacrosse	7,168	7,200	7,328		7,456	2.2%
Soccer	18,970	19,145	18,830		18,725	-0.7%
Softball	19,530	19,530	19,380		18,900	-0.8%
Tennis	4,740	4,740	4,620		4,560	-2.5%
T&F Indoor	2,625	2,625	2,625		2,790	0.0%
T&F Outdoor	24,360	24,360	24,400		24,360	0.2%

⁵ No Numbers Gathered Due to COVID-19 Pandemic

⁶ Does Not Include the 2021/22 Numbers. Those numbers are inserted for comparison purposes only

⁷ No Numbers Gathered Due to COVID-19 Pandemic

⁸ Does Not Include the 2021/22 Numbers. Those numbers are inserted for comparison purposes only

Girls' Sports – Table 2 (Cont.)

School Sports - Annual Participation / Number of Students at EASD							
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	TREND
Cross Country	27	38	24	22	29	28	3.7%
Field Hockey	59	48	64	64	60	46	-22.0%
Lacrosse	35	38	39	37	36	36	2.9%
Soccer	71	69	86	74	76	66	-7.0%
Softball	27	25	29	26	27	25	-7.4%
Tennis	27	38	14	26	23	25	-7.4%
T&F Indoor	0	0	16	32	1	20	0.0%
T&F Outdoor	87	72	82	78	73	95	9.2%

Includes number of students on freshman, junior varsity, and varsity teams

National (2016 to 2022)

- Lacrosse is the largest growing sport with an increase of 6.7%, with soccer coming in second at an increase of 1.5%.
- The largest drops are in tennis (2.5%) and field hockey (1.8%)
- Participation numbers for post COVID are all lower than the 2018/19 numbers. This should see an increase as things return to normal.

Statewide (2016 to 2022)

- Lacrosse is the largest growing sport with an increase of 2.2%, with cross country coming in second at an increase of 1.1%.
- Largest drop in participation is tennis at 2.5% with field hockey next at 1.8%.
- Participation is highest in outdoor track and field with 24,360 student athletes.
- Participation numbers for post COVID are mostly slightly less with some higher showing better recovery than nationwide.

Elizabethtown School District (2016 to 2022)

- As with the Boy's sports, the Girl's sports also had steady participation numbers through the pandemic.
- Only one sport had a double digit drop (Field Hockey 22%).
- Three sports had single digit increases in participation (Outdoor Track 9.2% / Cross Country 3.7% / Lacrosse 2.9%). All other sports had single digit drops.
- As with the Boy's sports, some of the teams have swings in participation that appear to average out over time. The sports with the most consistent numbers are softball and lacrosse.

Summary

- At the local school level, varsity sports tend to fluctuate in numbers of participants for a variety of reasons. This includes, but is not limited to, class size, number of athletes, team success, and coaches and peer involvement. Looking at both state and nationwide statistics will provide a better idea of how the sport is doing demographically.
- The Girl's teams are very much like the Boys teams with most of the teams having the swings in participation with two teams being mostly consistent while baseball is the only one for Boys.
- Only lacrosse is trending upward through all levels of data. All other sports trend differently at one level whether local, State or National.

3 Investigation of Existing Program and Conditions

- ◇ Existing Facilities Site Inspection
- ◇ Field Walkthrough / General Observation
- ◇ Athletic Programs and Field Use
- ◇ Field Need Analysis
- ◇ Options to Address Multi-Purpose Fields
- ◇ Synthetic Turf vs. Natural Turf Cost Analysis



INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

3A. Existing Facilities Site Inspection

ELA has met with District Staff twice on-site to review the facilities on the Campus. Weather conditions were good as we walked through all fields as well as the tennis courts and track.

Criteria for Evaluating a Natural Grass Athletic Field

When investigating a natural grass athletic field, the major points of consideration to evaluate the condition of the field are as follows:

- Field size - Does the space accommodate regulation-sized playing fields for each sport?
- Solar Orientation - Is the axis of play (goal to goal) in a direction where students are not looking into the sun?
- General Grass Health - Is grass cover consistent throughout field? Are the blades healthy with no noticeable stress? Are the roots deep?
- Grading - Are the slopes consistent with no low or high spots? Is top dressing done?
- Worn Areas - Are there any worn areas with no grass growth?
- Weeds - Any evidence of weeds? Is there a comprehensive weed management program in place?
- Pests - Any evidence of pest damage? Is there an Integrated Pest Management Program in place to control pests?
- Fertilization - Is soil testing done and followed up with a comprehensive fertilization plan?
- Aeration - Is the field regularly aerated?
- Irrigation - Is there an irrigation system in place? Is it a subsurface system or water wheel type?
- Overseeding - Is this done throughout the season to insure growth of turf grasses?
- Use Discipline - Is the field used during rain events? Is the field "rested" as much as possible to help promote recovery?
- Maintenance Program - Is there documentation of all maintenance records and is a comprehensive program in place to make sure work is consistent and proactive, not reactive?

If a field addresses each item above and successfully performs them, then it should be considered an excellent facility. If it only addresses a few, but the field remains playable and safe, it is a good facility. If little to no items are addressed and the field is uneven and mostly unplayable, then it is classified poor and in need of renovation.

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

Criteria for Evaluating a Synthetic Running Track, Track Venues and Tennis Courts

When investigating a synthetic running track and track venues, the major points of consideration to evaluate the condition of the facilities are as follows:

Running Track

- Surface
 - Is the surface level without bumps, bubbles, holes, or gaps?
 - Is the synthetic surface worn, delaminating, or failing in anyway?
 - Is the track clear of obstructions?
- Venue
 - Is there an obstacle-free zone on the inside and outside of the track at least one meter in width?
 - Is the track properly cordoned off to keep spectators from entering and to control entrance to venues?

Horizontal Jumps

- Pit
 - Is the sand raked, soft, and free of debris?
 - Is the area surrounding the landing area clear of obstructions?
- Take-off Board
 - If wooden, is it smooth and level with the runway, and is it secure?
- Runway
 - Is the length sufficient?
 - Is the surface level without bumps, bubbles, holes, or gaps?
 - Is the synthetic surface worn, delaminating, or failing in any way?

Vertical Jumps

- Pit
 - Is the area surrounding the pit clear of obstructions?
- Apron or Runway
 - Is the area or runway of sufficient size?
 - Does the approach come off of the track, cross a drain, or change the surface?
 - Is the surface level without bumps, bubbles, holes, or gaps?
 - Is the synthetic surface worn, delaminating, or failing in any way?

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

Throws

- Venue
 - Are the circle, cage, and sector clear of all loose material?
 - Is the venue adequately marked with fencing/roping to keep spectators out?
- Circle
 - Is the rim rounded with no jagged edges?
 - Is the circle smooth?
 - Is the area outside the circle clear of obstructions?
- Javelin Runway
 - Is the runway smooth with no holes or bumps?
 - Is the area around the runway clear of obstructions?
 - Is the synthetic surface worn, delaminating, or failing in any way?
- Sector
 - Is there a possibility that thrown implements will land on the track?

Tennis Courts

- Surface seams are tight and flush.
- Surface is smooth with no cracks or birdbaths.
- Surface is bright and not faded.
- All hardware is corrosion free.
- All hardware is in place and tight.

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

The Summary of findings for the fields, track, and tennis courts on the Main Campus are as follows:

3B. Field Walkthrough / General Observations

In October 2022 Matt Wimer from Hummer Turfgrass Systems, Inc. walked the fields on both campuses with Staff to observe their condition. Mr. Wimer is both a Certified Natural Turf Field Builder with the American Sports Builder Association as well as a Certified Sports Field Manager through the Sports Turf Managers Association and is well-versed in athletic field design and maintenance. His observations are noted below:

Varsity Baseball

- Need to rebuild infield. Entire infield mounds up and leaves no room to build a mound. Needs new diamond and at least 8' around exterior perimeter.
- Will not need much mix once edges are removed.
- Nitrogen fertility appears low
- Needs fert and seed to help fill voids
- Good shape and goof fall in outfield to move water off surface
- Much clover encroaching and chickweed



Photo 1 – Varsity Baseball

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

J.V. Baseball

- Very similar to varsity field. Infield diamond is in slightly better shape than varsity field but needs mound work bad. There is no mound. (see pics) Overall, could use a complete rebuild on infield and 8' around.
- Low on mix by 2-3 loads
- Needs new Homeplate
- Needs to be edged heavily to retain baseline and arc structure (see pics)
- Outfield has decent shape and grade to move water off surface
- Appears low Nitrogen fertility and in need of fertility and overseeding to thicken grass stand



Photo 2 – J.V. Baseball

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

Field 1

- No Crown
- Seems drier than most other fields. Good soil
- Sheets from the road down to the other fields. (see diagram)
- Overall decent coverage, more wear in the end closer to the school. Tarps are currently out on overseeded goal areas.
- Undulations are not too bad on this field but quite lumpy and bumpy from lack of fertility on ryegrass and tall fescue and from the winter freeze thaw.
- Weeds are starting to encroach in the thinner areas. (chickweed and clover) (see pics)
- If high use and water is a problem, this field could be crowned in order to move water off the center of the field. It is the only soccer field that falls left to right and not north to south. More fertility and seed needed.



Photo 3 – Field 1

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

Field 2

- No crown
- Water flows length wise from east to west. See diagram
- Sits slightly wetter than field #1
- Lumpy from worm castings, lack of fertility, and voids from clumpy ryegrass and tall fescue patches
- Good soil
- Field could be crowned if high use but wear is not over the top for the fertility it receives.
- Only worn in goal areas
- Much chickweed and zombie clover coming on
- Thinner on school side due to recess



Photo 4 – Field 2

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

Field 3

- Both this field and JV Football field slope from east to west and slightly toward the south east corner. (see diagram)
- No crown
- Low fertility and voids are growing clover and chickweed
- Needs seed and fertility to thicken stand.
- Build crown or internal drainage to dry out.



Photo 5 – Field 3

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

J.V. Football

- Very heavy wear down middle of field
- Slopes with field, east to west
- Need a better aeration and overseeding program in the fall of the year and should be covered if it can be over the winter.
- Needs fertility and seed ASAP
- Pineapple weed, chickweed prevalent
- Smaller field and does have slope to get water off. Doesn't hold much water.



Photo 6 – J.V. Football

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

Field 4

- Very clumpy with poa and ryegrass the main grass
- Sits more wet than any of the other fields.
- Very flat with no grade but probably the best field in terms of size and proximity to school
- Would be a candidate for resurfacing, and drainage. Probably has the most potential out of all the soccer fields.
- Some internal drainage now but not done properly and not enough.
- Many undulations. More than any other field. Should be regraded but if you do that you should do drainage as well.
- Little to no wear
- Appears low fertility even for ryegrass and poa.



Photo 7 – Field 4

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

Stadium

- Very good crown with a slight turtle shell shape that allows the corners to sit more wet than the main part of the sidelines
- Very good coverage
- They tarped between the hashes and it looks very good
- Some zombie clover here and there
- No track drains and slight step up from field to track surface. Probably holds some water after heavy rains but no problem when I was walking the fields.
- Grid drainage would help and irrigation if they want it to be there 'signature field'
- All ryegrass
- Overall very nice field and surrounding complex. Drainage and irrigation would take to next level.



Photo 8 – Stadium

Summary

Overall, stadium is by far the nicest field and complex and also has the best grassed surface. Infield/mound work on the baseball fields would go a long way but overall they have nice shape. Field 4 has best potential out of the other 4 fields and could be improved with a resurface and drainage. Other fields need increased fertility and a good overseeding program in order to get the fields back to where they need to be. Major reconstruction of fields 1-3 and the JV Football field would have to take place in order to increase playability to a much higher level. Fertility and the need for seed is a common theme on all fields.

3C. Athletic Programs and Field Use

Field Use and Need Analysis

Determining the number of fields required to support public school district athletic programs and justifying the construction of additional fields can often prove difficult. Many diverse opinions exist among the various stakeholders, which are often shaped by the “expectation of quality” and do not consider the maintenance and recovery periods required for athletic fields, as well as the differences in field stress due to the varying intensities of multiple sports. The provision of additional athletic fields and/or synthetic turf fields will reduce turf stress by limiting the number of events to where deterioration is reduced, turf recovery is feasible, and appropriate maintenance can be performed.

When analyzing field use you analyze multi-purpose fields only since they are used for multiple sports. Dedicated baseball and softball fields are not factored in for they are normally considered unique facilities dedicated to one sport. Overlay fields (those multi-purpose fields on ballfields) are included in the analysis.

The outdoor field sports and current field assignments provided for both campuses are per the following Figures and Tables:



INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

TABLE A – High School / Elementary School Field Use Estimates

VENUE	Fall	Winter	Spring	TOTAL EVENTS
Thompson Field	25	0	0	25
Jane Hoover Field	178	47	93	318
Field 1	76	0	30	85
Field 2	64	0	10	74
Field 3	44	0	10	54
Field 4	45	0	10	55
Church Field	75	0	10	85

Field Need Analysis

ELA analyzed field requirements using two widely accepted methods as described below:

Baseline Field Use/Turf Recovery Method – Natural Grass Field – Including Public Use

The following method used in determining field need is based upon the amount of activity (number of sporting events) that a natural turf field can be expected to recover from while undergoing a “normal” maintenance regimen over a period of three to four months (including reseeding, spot repair, aeration, and similar practices). This method requires certain assumptions regarding field conditions and maintenance practices and assumes that uses/activities will be reasonably distributed over a period of several months (such as a fall or spring sports season) and that the field will not be used when excessively wet. Physical education and special events use are not included in the analysis, as such usage is limited in time and not as intensive as high school sports.

It is widely accepted and documented that certain sports, such as football and lacrosse have a far greater impact on turf stress than other sports and generally result in greater damage to natural turf fields. Also, higher levels of competition, such as high school varsity sports (in contrast to junior high sports), can have a higher level of impact. These variances can be considered in establishing the maximum baseline use number, which generally averages between 25 to 50 events per season (50 – 100 per year), depending on the type and level of play associated with the sport. However, in an effort to simplify the approach, all sporting activities will be assumed to have a similar impact. The yearly event baseline for each grass field shown in Figure 1 has been set at 50 for the fields with minimal maintenance and 75 for

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

those with the highest level of maintenance. The highest number of events (100) is normally applied to fields with operating subdrainage and in-ground irrigation.

Table B below illustrates how this method is applied to High School / Elementary School Campuses. These calculations factor in use by both the School District and local youth sports organizations.

TABLE B – High School / Elementary School Field Use Estimates						
VENUE	Fall	Winter	Spring	TOTAL EVENTS	BASELINE EVENTS	VARIANCE
Thompson Field	25	0	0	25	75	-50
Jane Hoover Field	178	47	93	318	318	0
Field 1	76	0	30	106	50	-56
Field 2	64	0	10	74	50	-24
Field 3	44	0	10	54	50	-4
Field 4	45	0	10	55	50	-5
Church Field	75	0	10	85	50	-35

TOTAL EVENTS OVER on Grass Fields 174

174 Events over Baseline / 54 Avg. Events per Field = 3.22 Fields Needed (Use 4)

Based on the above methodology field use on the campus exceeds the maximum use level by 174 events on the natural grass fields. Using an average baseline of 54 events per field, **an additional four (4) fields are required to support the sports programs (both games and practices)**. This illustrates the heavy usage currently occurring on the fields. This calculation does not consider the impacts from physical education or special events.

0.5 Multi-Purpose Field / Sport Team Ratio Method – High School / Elementary School Campuses - School Teams Only

Another approach to analyzing multi-purpose field use and need analysis for a school campus includes providing one (1) “premier” field (stadium facility) plus one (1) field per school team (either a competition field and a practice field or a practice field and use of the stadium field). In most cases, all fields are scheduled for both fall and spring use, resulting in a common ratio of 0.5 fields for each team/sport. Based upon this methodology, the total multi-purpose fields needed on the High School / Elementary Campus are outlined in Table C below:

INVESTIGATION of EXISTING PROGRAMS and CONDITIONS

TABLE C - 0.5 Field/Sport Team Ratio Method			
Sport	Teams	Ratio	Field Count
Football	3 (Boys' Varsity, JV, Freshman)	0.5	1.5
Field Hockey	4 (Girls' Varsity, JV, 9 th Grade and MS)	0.5	2.0
Soccer - HS	4 (Boys' and Girls' Varsity, JV)	0.5	2.0
Soccer - MS	4 (Boys' and Girls' 7th & 8th)	0.5	2.0
Band	1	0.5	0.5
Stadium	1 "Premier" Competition Multi-Purpose Field w Grandstands	1	1.0
Total Multi-Purpose Fields Needed			9.0
Total Existing Multi-Purpose Fields			7
Deficiency of Fields			2

Ideally using softball or baseball fields as an overlay facility for practice of a field sport is not recommended since additional compacted areas are created in the outfield and often those field sports must play on the infield mix which is unsafe. It is recommended that dedicated multi-purpose exist for the particular teams if at all possible.

Summary

The total number of events requires an additional 3 fields to properly meet the current field capacity. The Field / Sport analysis indicates a need for two (2) multi-purpose fields. Current usage combined with the condition of the majority of practice fields (limited irrigation, no subdrainage, and limited maintenance staff) creates excessive wear on the fields creating more maintenance work to keep safe and playable fields. Broadleaf weeds and clover will begin to replace the natural grass for they can establish better in such conditions. Playing on wet fields, like so many School Districts were subject to in recent years, intensifies the damage by creating rutting, divots and compacting the topsoil. It only takes one rainy day game to do significant damage to a field. Constant use does not allow fields to get proper recovery time allowing grass to grow and develop a healthy root system. With the existing number of fields in place essentially at maximum capacity for school teams and the limitation on area to construct new fields to rotate usage, the facilities will continually need significant remedial work beyond the standard annual maintenance every five years or so. When factoring in community usage this only further illustrates that something must be done to address the usage issue.

3D. Options to Address Multi-Purpose Fields

Reconstruct / Renovate Existing Multi-Purpose Natural Grass Fields

Some of the natural grass fields need reconstruction and doing so will aid to some degree in supporting the usage demands on the fields. The fields requiring the most work in no particular order are: the stadium, and other four multi-purpose fields. Other fields require a moderate amount of work while some even less. Depending on field type (game / practice) and maintenance practices once the fields are redone, they will need to be revisited every five years or so to deal with wear and compaction issues that annual maintenance cannot address.

Construct Synthetic Multi-Purpose Turf Fields

Natural Grass athletic fields require proper construction in order to build a solid foundation on to which safe playing conditions can be established. Proper maintenance is required to address the wear and tear fields are subject to. The third factor is to maintain a reasonable number of events on the field. If any of these three factors are not up to standard the field will deteriorate.

It is our experience that the significant majority of K-12 Schools do not have the budget or the staff to keep up the necessary maintenance on natural grass fields. Fields may be kept at fairly playable and relatively safe playing conditions for a few years then consideration must be made to reconstruct the field by regrading and sodding for no level of maintenance can keep a grass field safe forever.

In the case of the Elizabethtown Area School District (EASD), the fields have been kept in fair shape considering the constant usage and need for irrigation on some of the fields. The issue is demand for the fields will only continue and possibly increase due to community demands. There is no possibility to rest fields properly to recover so they can naturally re-establish especially when factoring in community usage. The two ways to address this is to upgrade as many of the natural grass fields to slightly increase usage capacity or consider installation of synthetic turf fields.

In order to aid the district in the decision making process we are providing a Synthetic Turf vs. Natural Turf Cost Analysis in Subsection 3E below to understand the benefit of one type of field to another. In following Section 3 we have designs for these two options and schematic costs.

3E. Synthetic Turf vs. Natural Turf Cost Analysis

To address the need to provide proper field rotation and recovery on the High School / Elementary School campuses additional fields are not an option. The only methods available are to reconstructed some of the natural grass fields to a higher-level field (with subdrainage and irrigation) or consider synthetic turf as an alternative approach. Where a natural turf field similar to the current fields can handle approximately 50 to 75 events per year (three seasons) it is generally accepted in the athletic industry a well-constructed natural grass field, on average, can support 100 events per year. A synthetic turf field can handle a minimum of 1,000 events per year when lighted and operating four seasons.

Installation Cost

When synthetic turf is considered as an option the concern is the upfront cost to install the field compared to a natural turf field. For fields of comparable size synthetic always costs more primarily due to the stone subbase, turf, and infill (Approx. \$22.00 / SF¹). Installation of a higher quality natural grass native soil field as currently exists on the complex will fall in the higher range of cost of natural grass construction (Approx. \$10.50 / SF²). Using a 100,000 SF field area for comparison the costs are shown on Table D below:

TABLE D - Installation Costs						
Synthetic Turf			Natural Grass¹			
Cost Per (SF)	Field Area (SF)	Total Cost	Cost Per (SF)	Field Area (SF)	Total Cost	Difference
\$22.00	100,000	\$2,200,000	\$13.50	100,000	\$1,350,000	\$850,000

¹ Premiere natural grass having prepared subgrade, 6" topsoil, sodded, sand grid underdrain system, irrigation system. Unit cost/total are based on renovation of existing field area with limited bulk earthmoving. Costs may vary based upon actual field conditions.

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Seasonal Maintenance Cost

Premier natural grass fields require a significant amount of maintenance compared to a synthetic turf field. Mowing is the most intense, followed by lining, repairs, and irrigation. Synthetic turf requires grooming and maybe lining. Comparison of maintenance costs are shown on Table E below:

TABLE E - Seasonal Maintenance Comparison					
Synthetic Turf (ST) / Natural Grass (NG)					
Maintenance Item	Hours (ST)	Hours (NG)		Synthetic Turf	Natural Grass
Mowing	0.0	56.0	Material Cost	\$ 2,900.00	\$ 7,200.00
Brushing	56.0	0.0			
Irrigation	0.0	32.0	Labor Rate	\$ 60.00	\$ 60.00
Fertilization	0.0	16.0			
Aeration/Seeding	0.0	24.0	Total Labor	\$ 4,080.00	\$ 13,440.00
Field Markings	12.0	48.0			
Turf Repair	0.0	48.0	Total Cost	\$ 6,980.00	\$ 20,640.00
Total Hours	68.0	224.0			

Maintenance hours estimated as follows (Typical Public High School or Municipal Agency):

- 1 Mowing/Brushing: 28 weeks x 1 mowing/brushing per week x 2 hours, Synthetic Turf includes adding rubber/infill and brushing in at (2) applications per year
- 2 Irrigation (Natural Grass): 16 weeks x 2 hours per week for water wheel transport and set-up
- 3 Fertilization (Natural Grass): Fall and Spring applications, pre/post emergent herbicide, (4) total maintenance events x 4 hours each
- 4 Aeration/Seeding: Core field, pulverize and drag plugs, drill, or slit seed, 3-person crew x 8 hours = 24 hours
- 5 Field Markings (Natural Grass): Line markings, 2 hours each application, applied bi-weekly each Fall (6) and Spring Season (6) x 2-person crew
- 6 Field Markings (Synthetic Turf): Line markings (Field Hockey Only), 2 applications x 2 hours each x 2-person crew + 4 hours each
- 7 Turf Repair (Natural Grass): Spot repair, resodding, topdressing, 2 hours per week x 2-person crew x 12 weeks each Spring/Fall
- 8 Turf Repair (Synthetic Turf): Turf repair included as part of Warranty (No Cost)

Note: Labor rates are approximate and assumes allowance for hourly rate plus benefits.

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Per Event Cost Comparison

To properly compare the per-event cost a well-maintained premier natural grass field is considered since that will provide a better and safer playing surface for student-athletes and be better capable of withstanding heavier use. This type of field can be expected to support 100 events per year.

The following Table F illustrates the average costs that can be anticipated for a 100,000 SF field:

Table F - Synthetic Turf vs. Natural Grass Per Event Cost		
	Synthetic Turf	Natural Grass
Initial Cost Installation Cost / SF:	\$22.00/SF = \$2,200,000	\$13.50/ SF = \$1,350,000
Maintenance / Replacement Costs (10 years)	\$404,671	\$335,000
Total:	\$2,604,671	\$1,685,000
Annual Number of Events:	1000 x 10 Yrs. = 10,000 Events	100 x 10 Yrs. = 1,000 Events
Average Cost Per Event:	\$260.47	\$1685.00

¹ Square Foot Cost based on Sportsturf Managers Association publication "A Guide to Synthetic and Natural Turfgrass for Sports Fields" Current Edition adjusted for inflation.

² Id

³ Mowing, maintenance, water, equipment at \$30,000, over seeding at \$600, fertilizer at \$8000, wetting agents at \$1200, weed treatment at \$500

⁴ Includes prorated sweeper cost, 30 turf sweepings, miscellaneous repairs

So, although valid concerns exist for the upfront and Life Cycle Cost of a synthetic field the cost per event proves to be significantly less. The increased number of events that can be handled by the synthetic field can lessen the event demand on natural grass fields allowing them to be rested and recover.

4 Appendix

◇ Concept A - Recommendation 1



Concept A - Recommendation 1

