

Memorandum

To:	LPS School Community	Project Number:	23090
From:	SMMA	Date:	02/10/2025 rev2
Project Name:	Lexington High School		
RE:	Community Provided Design Options		
Distribution:	Dore & Whittier, Town of Lexington Department of Public Facilities (MF)		

LPS School Community:

As part of the initial feasibility study phase for the Lexington High School project – referred to as the Preliminary Design Program [PDP] phase - the project team has been working with the School Building Committee [SBC] to review several massing study options for the new high school. One goal of this phase is for the SBC to select a limited number of massing study options (a minimum of three is required by the Massachusetts School Building Authority [MSBA]) for advancement to the next stage of the feasibility study, the Preferred Schematic Report [PSR] phase. During the course of the PDP phase several members of the Town of Lexington community have proposed additional plan alternatives beyond those that were under direct consideration by the SBC. This memo summarizes SMMA’s review of the plans that were proposed by the community members listed below.

In general, SMMA appreciates the time, thought and consideration that the community proposals for the new or reimagined Lexington High School represent. This being said, we do believe that there are critical challenges associated with each of the proposals that have been received, which is why they have not been individually advanced as formal options for consideration by the SBC. We do believe there are valuable thoughts that are embodied in each of them which we have integrated into several of the more recent massing study options that are currently being reviewed by the SBC. Some of those insights are:

- Increased number of options that look to preserve the footprint of the existing fields (and avoid Article 97 permitting process) by building on the footprint of the existing school building, either in an addition-renovation scenario or a phased new construction scenario.
- Revisiting of site circulation to maintain major traffic circulation from Worthen Road in many options.

- Preservation of the existing auditorium and original main entrance facing Muzzey Street (Existing Buildings C and D) at the core of addition-renovation Option B.3

Considerations regarding the 04/16/2024 community proposal that has been suggested by Peter Kelley (see attachment #1):

- The “1” and “2” classroom wings that are proposed to be added to the west along Worthen Road and northeast parallel to Waltham Street would:
 - Further attenuate circulation horizontally through the school increasing student travel times between classes and exacerbating the feeling of long anonymous hallways that are non-conducive to fostering a sense of community within the school.
 - The width of the proposed classroom wings is noted in the text of the proposal to be 120 feet, which is sufficient to support the potential for progressive & appropriate spatial adjacencies. The 120-foot width was noted in the text of the 04/16/2024 memo but was not understood by SMMA as the graphic scale on the drawings included with the memo did not appear to be as wide as 120 feet.
 - Provide less than ideal building orientations of the primary learning environments for solar control and daylight access which negatively affect overall building performance and energy efficiency.
- The renovation of the 1950’s A & B wings will perpetuate the challenges inherent with original construction of that vintage:
 - The width of the 1950’s vintage wings yields only a single loaded corridor circulation pattern as a viable option which does not support next generation teaching and learning as outlined in the educational plan.
 - The existing A & B wings have a 13’-0” floor to floor height, which is less than the preferred modern floor to floor height that is closer to 16’-0” which is needed for modern ventilation systems and desired air change rates. This could result in low ceiling heights and consequently oppressive feeling interior environments.
 - To meet the educational program requirements regarding classroom size, existing rooms would need to be increased in size which would present the potential of freestanding columns being located in the midst of classroom spaces.
 - A gut renovation of the existing 1950’s structure would trigger the need to make the structural frame compliant with current building code in terms of lateral support. This would involve the addition of shear walls or steel cross bracing, which when combined with the note regarding freestanding columns in classrooms above, would greatly compromise and constrain the potential layout of new classroom spaces.
- The proposed relocation of the field house to the north presents a critical compromise in terms of the two independent sets of votes that will need to be made for the school and the field house due to MSBA requirements. Building on top of the existing field house footprint with something other than a new field house (or renovating the existing field house), creates the possibility that a new school could be approved by the town while the field house would not be approved, resulting in a new school without any type of field house.

- While this proposal does largely avoid building new construction on the existing fields, the necessary phased renovation of the 1950's wing will require the use of costly and non-MSBA reimbursable temporary modular classroom buildings. Those modular classroom buildings may need to be located on the fields in a temporary condition. If the modular classroom buildings are instead located temporarily over existing parking lots, that parking program would either need to be temporarily removed, relocated off site at an additional cost to the project, or relocated on top of the existing fields. There will also be an interim need for construction project lay-down space, as well as viable open land below which to install the ground source heat pump (geo-thermal) wells, all of which may compromise use of the fields during the duration of construction. In summary – maintaining all of the existing fields in operation or the duration of construction will be challenging regardless of the option that is chosen. The project is instead planning on off-site temporary accommodations for field resources during construction.

Considerations regarding the 04/22/2024 community proposal that has been suggested by Tina McBride and Lin Jensen (see attachment #2):

- The renovation of & addition of two stories above the 1960's vintage J & H buildings (Math & World Language) would prove to be challenging for the following reasons:
 - The existing J & H buildings have a 10'-4" floor to floor height, which is much less than the preferred modern floor to floor height that is closer to 16'-0" which is needed for modern ventilation systems and desired air change rates. This could result in low ceiling heights or even the need to omit acoustic ceilings entirely and consequently create oppressive feeling interior environments with compromised acoustics, as is found currently in those existing buildings.
 - The column grid spacing of the existing J & H buildings is too dense to efficiently provide classroom sizes that meet the educational program (and MSBA) requirements. Existing rooms would need to be increased in size which would present the potential of freestanding columns being located in the midst of classroom spaces. Additionally, because the existing classroom sizes are insufficient, the classroom count capacity of these existing buildings would be reduced driving up the size of the new construction additions to accommodate the balance of necessary classroom spaces.
 - The structural logistics of adding two floors above the existing structure is enormously complicated by the geo-technical qualities of the surrounding soil which has a high organic content and is consequently considered "soft". The existing structure is not sufficient to support either the vertical gravity loads or lateral loads of floors being added above. Any new structure for floors being added above would need to be located around the perimeter of the existing structure and laced through the center of it, which would erode much of the historic character/value of these buildings. This would also

involve an extreme cost premium and schedule impact due to deep foundation work and shoring of the existing structure during construction.

- The construction of new and/or addition/renovation four story structures on the northern edge of the site while renovating the two story 1950's vintage structures on the southern side of the site will create vertical discontinuity of the educational environment. The upper floors to the north will feel disconnected from the remainder of the school, and will create circulation bottlenecks as students need to move up into and down from the higher stories.
- The same challenges noted above for the prior community scheme regarding the renovation of the 1950's A & B wings would exist with this option.
- As an addition-renovation option that looks to re-use the majority of the existing structures, construction would be both highly disruptive to existing portions of the building which remain in operation, and would require the use of costly and non-MSBA reimbursable temporary modular classroom buildings. Similar to the comments provided for the prior community scheme, the presence of temporary modular classroom facilities and/or the other construction related activities on the site will impact the existing fields and parking lots, so these could not remain unaffected.

Considerations regarding the 03/22/2024 community proposal that has been suggested by Jim Williams (see attachment #3):

- Similar to the 04/16/2024 Peter Kelley community proposal commented on above, the new longer classroom wing that is proposed to be added to the west along Worthen Road would:
 - During discussion at the 6/6/24 Community Design Workshop, Jim Williams noted to SMMA that the long classroom wing shown on his diagrams were modeled on the 120-foot width of the Concord-Carlisle Regional High School, which does support the potential for progressive & appropriate spatial adjacencies. The 120-foot width was noted in the text of the 03/22/2024 memo but was not understood by SMMA as the graphic scale on the drawings included with the memo did not appear to be as wide as 120 feet.
 - Provide less than ideal building orientations of the primary learning environments for solar control and daylight access which negatively affect overall building performance and energy efficiency.
- The long Worthen Road addition is also separated from the remainder of the school (in the completed condition) by the presence of the field house. Moving around the perimeter of the field house segregates the portion of the school community that will be teaching and learning in that structure, again eroding a sense of connected community across the entire school. As a proposed 4-story structure separated from the rest of the school, it will also create vertical discontinuity of the educational

environment. All three of the upper levels will feel even more disconnected from the remainder of the school, and will create circulation bottlenecks as students need to move up into and down from the higher stories. Mr. Williams has noted that his diagrams could be implemented with or without the field house shown at the location in his diagrams. While relocation of the field house from its current footprint would improve the connection of the addition(s) in the diagram, it would remain a very long building that would detract from a sense of connected school community. Additionally, it has been noted previously that re-building the field house in a location other than upon the current footprint would create the possibility of the votes for the new high school passing while the votes for the field house do not, leaving the school without a field house.

Considerations regarding the 03/26/2024 community proposal that has been suggested by Jim Williams (see attachment #3):

- Comments here are similar to the 03/22/2024 proposal as much of that approach is common to this one.
- The renovation and re-use of the existing gymnasium in its current footprint/volume would not provide the necessary quantity of Physical Education stations in that space to meet the educational plan. While this scheme notes that 30,000 SF of existing space may be freed up due to new addition construction, converting the remaining existing space into expansion space for the gymnasium will be invasive renovation work which will result in extreme cost premiums and schedule impacts.

ATTACHMENT #1

COMMUNITY PROPOSAL SUGGESTED BY PETER KELLEY

Save Our Fields - Save Our Money!

A choice to consider

April 16, 2024

It is important to remember that it is not the buildings that make for a great education but what happens within them. This is evidenced by Lexington's consistent high reputation and standing.



Phase 1

- The new school requires roughly 500,000 sq ft gross area.
- New west wing classrooms and cafeteria are added in one three/four-story module along Worthen Road.
 $120 \times 480 \text{ ft} \times 3.5 = 201,600 \text{ sq ft}$
- The original main building and new library remain. Area approximately 140,000 sq ft.
- The field house is removed.



Phase 2

- World Languages and cafeteria functions, at a minimum, move into the new space.
 - A new north wing for remaining functions is built. $120 \text{ ft} \times 390 \text{ ft} \times 3.5 = 163,800 \text{ sq ft}$
- Total gross area is now 500,000 sq ft

Phase 3

- The new school is in full use. A larger field house can be added to the north.

Pros:

- The Worthen Road parking and bus loading area are preserved. Little if any parking is impacted.
- No playing fields are taken except a portion of the practice field.
- Considerable square footage of the solidly built 1950's structures is saved, including the historic main entry that connects the school to the Town Center along Muzzey St.
- Less cost in both dollars and time.
- Less waste and a smaller carbon footprint.
- Operations can continue on site during construction.
- **NO SWING SPACE NEEDED.**



I don't assume to have all the answers. I respect the work and expertise SMMA brings to this challenge. I simply ask these ideas get fair consideration. I welcome the chance to meet in a working group to vet them out.

Note: These are block diagrams with very rough calculations. The exact areas need to conform with educational programs.

Thanks for your consideration., Peter C. J. Kelley : peterckelley@gmail.com

Save Our Fields - Save Our Money!

ATTACHMENT #2

COMMUNITY PROPOSAL SUGGESTED BY TINA MCBRIDE AND LIN JENSEN

Option P influenced by Peter Kelley

Phase 1: Portable classrooms installed

Phase 2: Demo current Foreign Language building and construct 140k - 170k sqft new four story school building

Phase 3: gut and renovate the unmarked buildings in stages

Benefits

- Majority of embodied carbon locked into the existing asset
- Original Quad kept as outdoor space, renewed and closed on East side
- Visual connection with the center and Depot Sq remains
- Athletic fields are not disturbed and avoids complications of building on peat bog
- Development on north side of site will not obstruct solar generation on parking lots or buildings
- Site hydrology is not changed
- School remains open during construction

Updated 4/22/2024



Option B4

Phase 1: Two 4-story Additions

Phase 2: add 2 floors to current buildings and gut renovate

Phase 3: gut and renovate the unmarked buildings

Benefits

- Embodied carbon locked into the existing asset
- Quad kept as outdoor space, and enclosed on three sides
- Visual connection with the Depot undisturbed
- Athletic fields and parking lots are not disturbed and avoids complications of building on peat bog
- Development on north side of site will not obstruct solar generation on parking lots or buildings
- Site hydrology is not changed
- School remains open during construction

Updated 4/22/2024



11/11/2019

Figure 1

Phase 3: gut and renovate the unmarked buildings

- Embodied carbon locked into the existing asset
- Quad kept as outdoor space, and enclosed on three sides
- Connected view to Depot Square maintained with an open arch or glass
- Athletic fields and parking lots are not disturbed and avoids complications of developing on peat
- Site hydrology is not changed
- School remains open during construction

~~Updated 4/22/2024~~



ATTACHMENT #3
COMMUNITY PROPOSAL SUGGESTED BY JIM WILLIAMS

March 27, 2024

To: School Building Committee

From: Jim Williams

Re: New design options needed for a new or new and renovated high school

The committee has a responsibility to the town to develop plans for the school that lie, insofar as possible, off the playing fields. This was recommended by the town's Article 97 Working Group in 2022. The reasons are many and they are already known to the committee.

On Monday, March 18, SMMA brought to eleven the number of designs for a new school. All of them lie entirely on the football field and the two baseball fields south of Vine Brook. It brought to three the number of plans for a mix of a new and renovated school, all of which lie partly on these fields.

Please instruct SMMA to develop and make public plans, on or before the next public forum in April, which avoid entirely or avoid so far as possible the playing fields.

Below are two possible plans for SMMA to consider. The first is for a school that avoids the playing fields entirely except for the practice field, which is replaced. The second was drawn up at the request of former Select Board member Peter Kelley on behalf of him, Tina McBride and Lin Jensen. Its purpose is to show that a legitimate B plan is possible that saves existing school structures. It is their intent to present a plan at the April public forum. I ask that such a plan be made public by SMMA itself before or at the forum.

If such plans cannot or will not be produced in a timely fashion please inform me of that no later than Tuesday, April 2, 2024, if possible.

Thank you,

Jim Williams



Phase 1.

- The field house is kept.
- Wetlands along the practice field are replaced times 2.
- New construction northwest: classrooms.
4 floors 120 ft x 480 ft=230,400 sq ft
- New construction southeast: classrooms and cafeteria.
4 floors and a minimum of 120 ft x 210 ft = 100,800 sq ft
- Total new space after Phase 1 = 331,200 sq ft minimum.



Phase 2.

- Most academic activities move to new space, including art and music that are adjacent to phase 2 construction, as well as the cafeteria.
Some activities remain in place to avoid proximity to construction.
(The new space available for occupancy from Phase 1 is 26% more than the 263,000 sq ft of space it replaces, including old temporary classrooms.)
- The gym, auditorium, and administration areas continue to be used.
- The old cafeteria, art, and music areas are available for any purpose.
- The Humanities wing is torn down.
- Any of the Math, World Languages, and Science buildings can remain if needed.
- New construction of the public wing of the new school: gym, fitness center, auditorium, and administration.
- Total new square footage is now 500,000 sq ft minimum.
- This phase can be stretched out in time when necessary to guarantee noise- and disruption-free learning.



Phase 3.

- The new school is opened. Remaining old structures are torn down.
- The longest student walk between classes is reduced from 1300 ft to 1000 ft.
- The practice field is replaced northeast of the field house. This is the only field displaced by construction.
- The field house is expanded to the northeast if funded.
- Wetlands, meadow, and parking are added. Lost trees are replaced by some multiple of at least 2.

Mix of renovation and new that preserves the entire public face of the school March 26, 2024



- New classrooms and cafeteria are added in two four-story modules along Worthen Road.
 $120 \text{ ft} \times 480 \text{ ft} \times 4 = 230,400 \text{ sq ft}$
 $120 \text{ ft} \times 210 \text{ ft} = 100,800 \text{ sq ft}$
Total = 331,200 sq ft minimum.
- The field house and the front of the original main building remain.
- The gym and auditorium continue in use.
- The art, music, and cafeteria functions move, leaving 30,000 sq ft of space to expand P.E. and drama, or for public use.
- The longest student walk between classes is reduced from 1300 ft to 1000 ft.
- The field house can be expanded to the northeast if funded.
- A new practice field, wetlands, meadow, and parking are added. Lost trees are replaced by some multiple of at least two.