Creating Equitable Schools in Massachusetts

At this time, due particularly to the recent protests surrounding the Black Lives Matter movement, we are all called to reflect and to act upon the historic and ongoing toll that racial discrimination has taken on the Black and Brown minorities in our Country. Schools have traditionally been considered a critical steppingstone to a better life for all Americans. And yet, we know that today, many minority, primarily urban students have worse health outcomes and worse academic outcomes than their white, and typically, more suburban peers. Recent research has demonstrated that school buildings and their immediate environments are key factors in student health and academic outcomes.

- Traffic-related air pollution is linked to increased absenteeism, increased asthma as well as reduced student achievement.*1*
- Green space surrounding a school has been positively associated with reductions in chronic absenteeism. Access to surrounding greenness of a school is positively associated with academic performance, test scores, restored attention capacity, decreased stress levels, cognitive development.*2*
- A study of 8 to 10 year-old students' working memory and comprehension in association with noise conditions found that the children's performance on tests of auditory working memory and listening comprehension was significantly worse in noisy environments compared with quiet environments (Sullivan et al., 2015).*3* Noise has also been found to affect reading and writing adversely; research suggests that chronic exposure to noise affects children's cognitive development. *4*

We are all too aware that, nationally, urban school children often lack basic access to decent facilities, green places, and good environmental quality that directly impact health and educational outcomes. In Massachusetts much progress has been made in updating urban schools. But even with that sustained effort, frequently urban schools still do not have the resources to overcome the realities of their siting and environment and achieve the healthy physical environments equivalent to their suburban counterparts.

There is no single cause for this and there are many confounding obstacles. These obstacles all have the ultimate impact of reinforcing inequity between white and minority communities.

Construction costs tend to be higher in dense urban communities, generally more than offsetting higher reimbursement rates targeting those communities and forcing "value engineering" decisions that can directly undermine student health and academic achievement.

Urban schools are more likely to be in areas with high air pollution due to higher traffic levels than their suburban counterparts.

Urban school are more likely to have challenging acoustical environments due to greater vehicular traffic, adjacencies to airports, railroad tracks, etc. than their suburban counterparts.

Urban schools tend to have far less accessible green spaces and play spaces than their suburban counterparts.

Urban schools tend to have higher net-to-gross floor area ratios due to highly constrained sites that both restrict floor plan efficiency and require more floors of construction than their suburban counterparts.

Trying to achieve required MSBA net-to-gross ratios on these constrained sites can result in restricted internal student circulation and the associated loss of critical, informal learning and social space that might more typically occur along corridors, at junctions, and entries where students can stop and share experiences and ideas.

Urban youth tend to have less access to other physical community resources than students in wealthier suburban communities. Students in suburban communities may have access to community centers, libraries, theaters, and specialized recreational facilities that can be rare in minority neighborhoods.

Ideas for Mitigation

These discrepancies can and must be mitigated. Prioritizing steps to address these specific issues should be considered and steps to move forward with that mitigation should be undertaken. The following are suggestions, but other approaches may be equally or more valid.

Some potential steps at mitigation are straightforward:

- External acoustics can be mitigated through properly insulated windows, envelope insultation, and detailing. These steps are more expensive than what a standard suburban school might require and thus might not be included in a final project when budgets are tight. These mitigation measures should be required and supported at school sites that have environmental background noise.
- Air pollution can be mitigated by using high-efficient filters such as MERV 14 and appropriate mechanical systems. These steps are more expensive than a standard suburban school might employ and thus might not be included in a final project when budgets are tight. These mitigation measure should be required and supported at school site that have elevated traffic or other air pollution factors.

Mitigation for other issues may be more complicated but a focused review should be undertaken to assure they are developed and funded appropriately.

For instance, the potential for creating greenspace and play space when there is none. Many urban projects have zero, or near zero usable open space once the school footprint is determined. Potential solutions for creating adequate greenspace exist, for instance:

1. Rooftops can be used to create green space and play space. Careful planning of rooftop vents and mechanical equipment during the initial design phases can help create adequate rooftop play spaces. Deep rooted plants and trees can be very costly but should be required and supported to assure well vegetated green spaces.

2. Current MSBA regulations do not allow the purchase and development of non-adjacent property for green space and play space. These regulations could be modified for urban situations so that communities can purchase properties to provide necessary greenspace even if it is not immediately adjacent to the school property.

3. There is no current MSBA mechanism to allow the enhancement of and use of nearby public land for school green and play space. Nearby parkland could be enhanced and maintained for school use if appropriate regulations were in place.

Similarly, current regulations do not allow for the creation of dedicated community use spaces within a school. Schools, by their nature, are community buildings used for sports, performance and community gatherings during after-hours. During the current Covid-19 crisis schools are often the community centers for food distribution and information. Enhancing these school buildings to house a needed community gathering space, such as a parent center, a library, or early education center could make a significant difference in communities with few resources.

Changes to Current Funding Mechanisms

How might we assure that these mitigation proposals are funded? Here are a few possibilities. The current reimbursement formula considers community wealth as well as student poverty, but the reimbursement does not take into consideration construction costs within the community. The reimbursement formula could be reconsidered to reimburse urban communities with high construction costs more generously than other communities. Alternatively, the current cap on dollars per square foot of construction costs in minority communities could simply be raised.

Incentive points currently do exist to benefit "smart growth" communities that could conceivably benefit some urban communities but the language in that incentive point currently requires density levels that are not reflective of many urban Specifically, the current language appears to limit the incentive point to areas of one, two and three family dwellings while ignoring more densely populated communities.

The incentive point system could be redesigned to better address minority community needs. For instance, the incentive points system could be designed to specifically reward urban communities whose buildings are designed to offset demonstrated health hazards such as air pollution and noise pollution that are so detrimental to their students.

Regulations constraining the purchase of non-contiguous properties in urban situations should be reconsidered. The need for play space and for green environments is so directly connected to student outcomes that specific regulations requiring green space whether nearby or on roof tops should be incorporated into regulations and supported through funding adjustments.

Adjustments to MSBA standard net-to-gross ratios should be allowed if the sites are not conducive to those standards.

Wealthier communities may provide specialized spaces that are valuable to the community and are paid for by the community. Less wealthy and minority communities may not have the financial ability to pay for these specialized spaces. This sets up another inequity between wealthy and poor communities that that should not exist.

There are many challenges within our society to reduce racism and create a more equitable community for all of our children. School construction need not be a roadblock to that goal.

1. *(MacNaughton et al., 2017)*
2. *(MacNaughton et al., 2017)*
3. *(Sullivan et al., 2015).*
4. *(Klatte et al., 2013)*

Still being developed-foot note references

Foot note 1

…poor air quality has a well-established negative association with mortality risk, cardiovascular health risks, reduced lung function, adverse birth outcomes, and an exacerbation of preexisting conditions (i.e., asthma) [22–26]. Traffic-related air pollution is associated with higher prevalence and incidence of asthma, which disproportionately impacts urban students [27]. Children are particularly vulnerable to particulate matter with an average diameter less than 2.5 microns (PM2.5) exposure because they have greater lung epithelial layer permeability, developing immune systems, larger lung surface areas, and breathe 50% more air per kilogram of body weight compared to adults [28]. Beyond diminished lung function, studies have shown that children exposed to air pollution have poorer cognitive functioning, impaired neurological function, and lower intelligence quotient (IQ) scores compared to non-exposed children [29,30]. Children's neuropsychological development can be negatively impacted by exposure to nitrogen dioxide,PM2.5,and polycyclicaromatic hydrocarbons[31] and exposure to traffic-related air pollutants contributes to impaired brain development among children[32]. Air pollution levels around schools have been linked to poorer student performance[30], lower individual student grade point averages [33], and reductions in sustained attention [34].

Footnote 2 Access to surrounding greenness of a school is positively associated with academic performance, test scores, restored attention capacity, decreased stress levels, cognitive development [14], reduced mental fatigueandaggression,andimprovedcopingwithAttentionDeficitDisorder[15]. Inschoolswithmore playareas,studentshavehigherlevelsofphysicalactivity[16]. Greenspaceprovidesopportunitiesfor physicalactivity,andmayimprovecognitivefunction,learning,andmemorythroughexercise[17–19] orthroughothermechanisms;timeinnaturecanfosterchildren'simaginationandcreativity,cognitive andintellectualdevelopment,andsocialrelationships[20,21]. Conversely, [34].