



# Building an Equitable School System for All Students and Educators

## *Section 3*

### *Infrastructure: The Physical State of Minnesota's Schools*



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# Introduction

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**Every school day, nearly 50 million K-12 students and six million adults occupy close to 100,000 public school buildings on an estimated two million acres of land. The nation continues to underinvest in school facilities, leaving an estimated \$38 billion annual gap. As a result, 24% of public school buildings were rated as being in fair or poor condition. (American Society of Civil Engineers, 2017)**

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The physical state of public school buildings, in both Minnesota and the nation, are inadequate. Experts with the American Society of Civil Engineers (ASCE) (2017) have noted:

Every school day, nearly 50 million K-12 students and six million adults occupy close to 100,000 public school buildings on an estimated two million acres of land. The nation continues to underinvest in school facilities, leaving an estimated \$38 billion annual gap. As a result, 24% of public school buildings were rated as being in fair or poor condition. While there have been a number of insightful reports in recent years, state and local governments are plagued by a lack of comprehensive data on public school infrastructure as they seek to fund, plan, construct, and maintain quality school facilities. (American Society of Civil Engineers, 2017)

Most corporations and government agencies have adapted and updated their buildings to protect workers. New laws have protected homeowners and those looking to buy homes from environmental poison. Yet, despite these efforts, lawmakers still allow schoolchildren and educators to work in sub-par buildings that are toxic, uninviting, and dangerous.

Scientists have confirmed that the climate is changing at a rapid pace. Modern advancements are introducing humans to new pathogens and carcinogens, and medical researchers have shown that some building materials of the past lead to health problems later in life. Thus, Minnesota lawmakers need to provide local districts with the funding needed to respond to these new realities. It is time to construct new buildings, and retrofit existing structures, in accordance with best practices.

We support the efforts of researchers at the Centers for Disease Control and Prevention who have developed a framework for school health promotion, known as the Whole School, Whole Community, Whole Child (WSCC) model. Scholars have proven that “a healthy and safe physical school environment promotes learning by ensuring the health and safety of students and staff” (Centers for Disease Control, 2015, August 19). We believe that all students and educators deserve school facilities that are clean and safe. As we talk about infrastructure in this section, we follow the CDC’s definition. For us, infrastructure refers to

the school building and its contents, the land on which the school is located, and the area surrounding it. A healthy school environment will address a school’s physical condition during normal operation as well as during renovation (e.g., ventilation, moisture, temperature, noise, and natural and artificial lighting), and protect occupants from physical threats (e.g., crime, violence, traffic, and injuries) and biological and chemical agents in the air, water, or soil as well as those purposefully brought into the school (e.g., pollution, mold, hazardous materials, pesticides, and cleaning agents). (Centers for Disease Control, 2015, August 19)

It is time lawmakers provide the funds, so all Minnesota students learn in places that meet these standards.

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**Minnesota has burdened local education agencies by providing inadequate funding for school infrastructure. This has led to some Minnesota students attending school in buildings that may be unhealthy, unsafe, and unwelcoming.**

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Minnesota has burdened local education agencies (LEAs) by providing inadequate funding for school infrastructure. This has led to some Minnesota students attending school in buildings that may be unhealthy, unsafe, and unwelcoming. Currently, local education agencies receive very little funding from the state and federal government that can be used to build schools and other needed infrastructure. LEAs are also responsible for maintenance and upkeep of buildings, which further strains budgets and often leads to difficult decisions by administrators.

LEAs do have the ability to use bonds and levies to increase revenue for capital expenses. However, LEAs in more affluent areas of the state have a much easier time passing these increased property taxes than LEAs in poorer parts of the state (although this is not the case for all affluent LEAs). Some districts have not been able to successfully pass a bond or levy for capital improvement in over a decade. We will cite the work of organizations, like Schools for Equity in Education, in this section that have drawn public attention to this problem. We believe that the legislature could address many of the problems in this section by restoring the general education levy.

In addition, we draw attention to the fact that the 2018 legislative session delivered a one-time, wholly inadequate allotment of \$25 million to the Minnesota Department of Education for school capital improvements related to safety. Districts submitted applications for one-time grants to improve the quality of their buildings and classrooms. MDE received several applications that totaled approximately \$250 million – 10 times the amount allotted. Minnesota’s LEAs are struggling to balance personnel and curricular costs with capital expenses. It is time for state lawmakers to help Minnesota LEAs build safe and clean school structures for all students and educators. In this section, we address the infrastructure needs in Minnesota by covering the following topics:

- Reasons to act on infrastructure
- The state of public school buildings and areas of concern
- National trends in school infrastructure funding
- Problems with Minnesota’s funding of school infrastructure
- Equity concerns tied to school infrastructure
- Minnesota’s infrastructure funding shortfalls
- Potential solutions for Minnesota policymakers

## Reasons to Act on Infrastructure

*We invite all policymakers reading this document to stop and reflect on the following questions:*

- 1. Do you have air conditioning at work for the days when outside temperatures are above 90 degrees?*
- 2. Does your work building contain dangerous chemicals that can lead to lifelong chronic illnesses?*
- 3. Do you work alongside mice, rats, and other disease carrying rodents?*

Minnesota's students and educators are worthy of clean and safe buildings. We invite all policymakers reading this document to stop and reflect on the following questions:

1. Do you have air conditioning at work for the days when outside temperatures are above 90 degrees?
2. Does your work building contain dangerous chemicals that can lead to lifelong chronic illnesses?
3. Do you work alongside mice, rats, and other disease carrying rodents?

We predict that most policymakers answered no to all of these questions. Unfortunately, the students and educators of Minnesota are not as lucky. Many children suffer through sweltering heat cycles while trying to learn difficult subject matter. Education support professionals must work to prevent rodents from overtaking many classrooms. Moreover, many educators have worked in "sick buildings" throughout their careers and this has led to chronic illnesses. It is time for this to stop.

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**“Children are not little adults. They have unique needs, sensitivities, and vulnerabilities, and it is becoming increasingly evident that current school building conditions may not be sufficiently protective of our students’ developing bodies and minds.”**

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We agree with the researchers at the Harvard T.H. Chan School of Public Health who have argued:

Children are not little adults. They have unique needs, sensitivities, and vulnerabilities, and it is becoming increasingly evident that current school building conditions may not be sufficiently protective of our students’ developing bodies and minds. A large body of research has demonstrated that the school building influences their success as much as any other factor. Now it is time to act on behalf of our children and teachers, who deserve to develop, learn, and thrive in a healthy environment that optimizes their potential to succeed. (Healthy Buildings Program)

In addition, Baker and Bernstein (2017) have proven that researchers have developed the technologies to improve school quality. They have confirmed:

1. We know how to build classrooms that minimize background noise and allow voices to be heard clearly, which will allow students to hear their teachers and protect their aural health.
2. We have clear evidence that certain aspects of school buildings have an impact on student health and learning, such as:
  - a. When deprived of natural light, studies have shown that children’s melatonin cycles are disrupted, thus likely having an impact on their alertness during school (Figueiro & Rea, 2010).
  - b. Teachers report higher levels of comfort in their classrooms when they have access to thermal controls like thermostats or operable windows (Heschong, 2003, and Lackney, 2001).
3. According to researchers at Lawrence Berkeley National Laboratories, when ventilation rates are at or below minimum standards (roughly 15 cfm per student), an associated decrease of 5-10% occurs in certain aspects of student performance on tests. (Baker & Bernstein, 2017, p. 1)

Minnesota lawmakers should make infrastructure improvements because the protection of children and educators at school is a fundamental responsibility of the government. However, researchers have also produced a list of other connections between student learning, educator success, and physical space. Researchers with the American Society of Civil Engineers have recently documented that:

1. A comprehensive report in 2006...showed that teacher quality and retention can be influenced by the teacher's environment, which in this case refers to multiple factors—indoor environmental quality, administrative support, supplies, etc.
2. Buckley, et al. found that the quality of facilities had a “substantively important effect on teacher retention,” even when statistically controlling for other potential factors like pay, parent and community involvement, age of the teacher, etc. (Buckley, et al., 2005). In fact, researchers found that facility quality showed a greater predictive ability on teacher retention than teacher pay for this group of study participants. (Baker & Bernstein, 2017, p. 24)

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**Lawmakers can stop educator attrition, in part, by  
building more sustainable workplaces.**

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Minnesota lawmakers can update school infrastructure as one way to ensure the success of students and educators. Walker (2018) has made the important observation that

Education is labor intensive, and ultimately the success of any reforms must be built on a high quality and satisfied workforce that is given adequate tools for meeting the new challenges and standards of education. As the need for more highly qualified teachers becomes central to the nation's educational reform agenda, we are asking schools to attract, retain and train the kinds of teachers that children need, while asking these highly educated professionals to work in inadequate working environments that can literally be dangerous to their health. (p. 22)

Walker also confirmed that researchers know “poor facilities contribute to the high turnover rates endemic to central urban school districts” (Walker, 2018, p. 22). Lawmakers can stop educator attrition, in part, by building more sustainable workplaces.

In addition, the state will derive many other benefits from improving physical structures. First, Ciolino (2016) cited “improved graduation rates, increased lifetime earnings of the next generation, and increased property value” as three compelling reasons to fund structural improvements (p. 113). Second, Filardo (2016) has argued that, “investing in public school infrastructure increases the value of property beyond the amounts borrowed, boosts enrollments, and helps rebuild confidence in a formerly struggling district or school” (p. 7). Finally, scholars have confirmed, “the most immediate gain to be realized via a large-scale public school facility program is increased employment” (Ciolino, 2016, p. 113). Ciolino (2016) documented one estimation that

each one billion dollars invested in building or renovating schools will create between 9,000 and 10,000 jobs. Therefore, an aggressive school renovation program has the potential to put many Americans back to work while improving the quality of life and education for our nation’s young people. (p. 113)

Minnesota will also reap economic benefits by providing the funds needed to modernize school structures.

Finally, Minnesota lawmakers must remember, “In many instances school buildings also serve communities as emergency shelters during man-made or natural disasters” (American Society of Civil Engineers, 2017). School buildings are the largest structures to house many people in some communities. Lawmakers should remember this “secondary function” of schools and update school buildings because they play “a significant role in public health, safety, and welfare” (American Society of Civil Engineers, 2017). This means many schools will need “windows that can withstand high winds, structures designed to survive earthquakes, and rooms specifically designed as shelters from tornados” (American Society of Civil Engineers, 2017). Lawmakers will be failing many rural communities if they fail to act.

# The State of Public School Buildings and Areas of Concern

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**We did it! We topped 100° in my #CHCougars classroom. I'm not sweating anymore. I'm light headed. I have a headache. All the classic signs of heat exhaustion. Imagine what my pregnant & nursing colleagues are going through & of course my students, esp, those observing #Ramadan, 2:28 PM - May 29, 2018 (as cited by Walker, 2018).**

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Civil engineers and architects have confirmed that public schools in the United States are not meeting the needs of students and educators. Minnesota is witnessing the effects of climate change, as summers grow longer and hotter. This means what were once "cool months" like May and September will have days in the high 90°F range. Last spring, a teacher in St. Paul, Mark J. Westpfahl, made national news when he tweeted:

We did it! We topped 100° in my #CHCougars classroom. I'm not sweating anymore. I'm light headed. I have a headache. All the classic signs of heat exhaustion. Imagine what my pregnant & nursing colleagues are going through & of course my students, esp, those observing #Ramadan, 2:28 PM - May 29, 2018 (as cited by Walker, 2018).

Walker (2018) reported that Westpfahl went on to describe how he used box fans and bottled water to help his students cope and refocus on their academic work. Clearly, Minnesota schools are not retrofitted for modern needs.

Researchers at the ACSE (2017) have confirmed, "Recent government statistics show that a significant numbers of public school facilities are not in acceptable condition. Among public schools with permanent buildings -99% of public schools -almost a quarter (24%) were rated as being in 'fair' or 'poor' condition" (American Society of Civil Engineers, 2017). In addition, these reports fail to account for the fact that "31 percent of schools have temporary buildings, either in addition to or instead of permanent buildings." (American Society of Civil Engineers, 2017). The ASCE (2017) has argued that:

1. In more than 30% of public school facilities, windows, plumbing, and HVAC systems are considered in "fair" or "poor" condition.
2. Outdoor facilities such as parking lots, bus lanes, drop-off areas, fencing, athletic fields, and sidewalks are also problematic.

3. Thirty-six percent of school parking lots are in “fair” or “poor” condition, as well as 32% of bus lanes, 31% of athletic facilities, and 27% of playgrounds.
4. More than half (53%) of public schools need to make investments for repairs, renovations, and modernizations to be considered to be in “good” condition.
5. Four in 10 public schools currently do not have a long-term educational facilities plan in place to address operations and maintenance.

It is safe to say that the public school infrastructure in the United States is not meeting the needs of educators or students.

The statistics do not improve when shifting to Minnesota’s public school infrastructure. The Minnesota section of the ASCE gives the state an overall grade of C (on a traditional A-F academic scale) for statewide infrastructure quality. They also predict that the state faces an \$818 million gap in school capital expenditures. Minnesota is only providing an “adequate” infrastructure system and is not giving enough attention to aging structures. In their report, the researchers do not systematically analyze all public school buildings, but they do draw attention to concerning facts that affect the quality of school infrastructure.

For example, the MnASCE experts have confirmed “approximately 79% of Minnesota residents are served by community water systems,” but the same experts gave the water structures in the state a grade of C- (Minnesota Section of the American Society of Civil Engineers, 2018). These same systems feed into the school buildings where teachers and students spend their days. We know state infrastructure is aging, and lawmakers should provide the funds to rebuild and sustain Minnesota’s public works.

# National Trends in School Infrastructure Funding

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**The buildings and classrooms in which educators work and students learn are deteriorating at alarming rates, but the federal government is doing less to help states and LEAs curb this problem.**

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The physical infrastructure for U.S. public schools do not meet the needs of students. The buildings and classrooms in which educators work and students learn are deteriorating at alarming rates, but the federal government is doing less to help states and LEAs curb this problem. Ciolino (2016) characterized the size of this problem by writing:

it would take more resources than those allotted to the entire Department of Defense just to modernize America's schools. Furthermore, the facilities' needs estimates could only barely be fully funded using the 2014 federal deficit spending. In other words, school facility financing needs are beyond the fiscal capacity of the federal government. (p. 125)

We provide this national assessment to give perspective on how bad the problem is for Minnesota. We agree with Ciolino's (2016) argument that "although there still are legitimate arguments for maintaining local control over some components of public education, the absence of federal and state funding for local facilities threatens both the quality of the education and the physical health of students in many localities" (p. 111).

School infrastructure is a multifaceted problem that requires consideration of both (1) upkeep of current facilities and (2) new physical space needs to educate students. Mary Filardo (2016), writing for the 21st Century School Fund, National Council on School Facilities, and the Center for Green Schools, offered three important questions that must frame any discussion about school infrastructure. She asked:

1. Do states and districts have adequate operating funds for cleaning, maintenance, and repairs to ensure buildings and grounds are healthy and safe?
  2. Are districts and states investing the capital funds necessary to ensure that their public schools are educationally appropriate, energy efficient, and environmentally responsible?
  3. Are states and the federal government doing enough to ensure equity in education, so that all students have access to healthy and safe school facilities that support learning?
- (p. 3)

In regard to infrastructure, Filardo (2016) has estimated the United States faces \$8,467 in long-term debt per student, and Minnesota ranks near the top of states with \$5,962 in long-term debt per student. In sum, the U.S. government and the state of Minnesota are not adequately investing in the long-term infrastructure needs of public schools.

Ciolino and Filardo have both painted a very grim but necessary portrait of this growing problem. At first, it might seem both the federal and state governments have reached a “point of no correction.” However, we remain optimistic that innovative technology and new funding streams will provide adequate resources to LEAs. Policymakers cannot remain incaltrant on this issue and pass funding problems to local agencies. Ciolino (2016) has noted, “if no steps are taken to begin remediating this crisis, it will only grow less achievable and more pressing over time. The collaborative program should engage all three levels of government and operate using accurate and current information” (p. 126). State and federal lawmakers can no longer ignore the physical state of public school buildings and classrooms.

# Equity Concerns Tied to School Infrastructure

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**School infrastructure is not immune from the racist structures that produce and reproduce inequities across the E-12 system.**

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As we have noted in every other section of this paper, U.S. public schools face a myriad problems tied to systemic racism. School infrastructure is not immune from the racist structures that produce and reproduce inequities across the E-12 system. Filardo (2016) has documented that “the quality of public school buildings and grounds is a health, educational, and environmental equity issue for families and communities” (p. 6). Many states have “established by law the importance of facilities as a factor in equal opportunity in education” (Filardo, 2016, p. 6).

Minnesota should encourage districts to build schools in a manner that reflects a sense of care and respect for all students. Minnesota lawmakers must realize that the state of public school buildings is an important social justice issue. In particular, lawmakers should give particular attention to how poor school structures disproportionately harm (1) students of color and (2) transgender and gender non-conforming students.

## STUDENTS OF COLOR AND SCHOOL INFRASTRUCTURE

As we have noted, LEAs must use levies and bonds for capital improvement projects. This means ZIP codes will often determine the quality of school buildings. Ciolino (2016) rightly argued, “The truth is our localities—particularly in low-income communities—do not have the financial resources to maintain the schools over which they have been delegated authority by their respective states” (p. 126). Fidalro (2016) has further stated,

Low-wealth districts often get trapped in a vicious cycle; underspending on routine and preventive maintenance in the short term leads to much higher building costs in the long term. It is not just students who are affected by the quality of the school facilities. (p. 7)

All children in Minnesota deserve safe, healthy, and clean spaces in which to grow and learn. Lawmakers must adjust funding formulas to account for the wide discrepancies between the quality of buildings and structures in wealthy and low-wealth districts.

We have already discussed how climate change is disrupting learning in buildings. However, some students experience the effects of rising temperatures more than others do. Walker (2018) has noted that

Black and Hispanic students are more likely to attend high-poverty schools, which are more likely to lack air conditioning. In addition, more affluent parents are better positioned to reduce the academic effects of hot classrooms on their children with home air conditioning, or paying for a tutor after school.

Walker also confirmed, “The disproportionate impact of hot classrooms on students of color...heat effects account for up to 13% of the U.S. racial achievement gap” (Walker, 2018). Unfortunately, the lack of air conditioning is just one example of many that show how students of color attend school buildings with the most structural problems.

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**“Public school facilities play a significant role in determining a student’s sense of self-worth and performance in school. Therefore, inadequate facilities for disadvantaged groups of children serve to compound the challenges that these children will face throughout their lives”**

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Minnesota cannot tackle the racial opportunity gap if students of color and low-income students go to school in sub-par buildings and classrooms. We remained troubled by the fact that

The quality of a child’s public school building often depends on the property value to pupil ratio within the boundaries of arbitrarily drawn school district lines. This funding system relegates low income and minority students to substandard public schools, due to politically drawn lines. Meanwhile, higher wealth and predominantly white districts are capable of providing quality facilities to the students within their boundaries. (Ciolino, 2016, p. 109)

Researchers have confirmed, “public school facilities play a significant role in determining a student’s sense of self-worth and performance in school. Therefore, inadequate facilities for disadvantaged groups of children serve to compound the challenges that these children will face throughout their lives” (Ciolino, 2016, p. 109). Minnesota lawmakers owe all students and educators, regardless of where they live and work, better learning environments.

## TRANSGENDER AND GENDER NONCONFORMING STUDENTS AND SCHOOL INFRASTRUCTURE

Minnesota must also retrofit buildings to account for the rights of transgender and gender non-conforming students. The Minnesota Human Rights Act “prohibits discrimination and harassment in education based on gender expression, actual or perceived gender identity and actual or perceived sexual orientation.” The Minnesota Department of Education has issued guidance that states:

Minnesota law provides that all students have the right to attend school in a safe and supportive environment where they can learn and have equal access to all educational opportunities. Illegal discrimination can occur if a student is expressly denied full utilization of a benefit at school, is indirectly denied full utilization of a benefit at school due to a policy, practice or procedure of the school or if a student is exposed to a hostile environment that interferes with the student’s ability to learn or participate in activities at school. (Minnesota Department of Education, 2017, p. 4)

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**Many Minnesota schools are violating the rights of transgender and gender nonconforming students by not providing appropriate restrooms and locker rooms. We encourage all LEAs to make sure buildings in their districts comply with the guidance in the MDE document *A Toolkit for Ensuring Safe and Supportive Schools for Transgender and Gender Nonconforming Students*.**

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Many Minnesota schools are violating the rights of transgender and gender nonconforming students by not providing appropriate restrooms and locker rooms. We encourage all LEAs to make sure buildings in their districts comply with the guidance in the MDE document *A Toolkit for Ensuring Safe and Supportive Schools for Transgender and Gender Nonconforming Students*.

This requires school leaders to “ensure that all students have access to restrooms, have access to locker rooms to fully participate in classes, sports and activities and have access to hotel accommodations when travelling with school groups for athletic, educational and/or cultural purposes” (Minnesota Department of Education, 2017, p. 12). School officials must “work with transgender and gender nonconforming students to ensure that they are able to access needed facilities in a manner that is safe, consistent with their gender identity and does not stigmatize them” (Minnesota Department of Education, 2017, p. 12).

# Minnesota's Infrastructure Funding Shortfalls

Researchers must account for widely different LEA budgets when accounting for Minnesota's infrastructure funding shortfalls. Ciolino (2016) explained how states pay for school capital investments by writing,

Many states have established funds in some form or another to provide for school facility construction, renovation and maintenance. These facility funds often are substantively inadequate by design, and many of them are underfunded on an annual basis by state legislatures...By and large, the states' general message is that public school facility financing is predominantly a local responsibility. (p. 109)

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**Minnesota ranks among the states not meeting the infrastructure needs of schools. Researchers estimate that all LEAs in the state will need approximately \$5.34 billion between fiscal years 2012 and 2024 to meet infrastructure costs.**

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Minnesota ranks among the states not meeting the infrastructure needs of schools. Researchers estimate that all LEAs in the state will need approximately \$5.34 billion between fiscal years 2012 and 2024 to meet infrastructure costs. In addition, Minnesota has the second lowest daily maintenance and operations (M&O) spending of any state after Georgia, at 7.7% (Filardo, 2016, p. 13). The students and educators in Minnesota deserve better facilities. It is time to rethink the infrastructure formula in Minnesota. State lawmakers must quit passing this bill down for LEAs and communities to pay.

# Potential Solutions for Minnesota Policymakers

Minnesota needs to increase the amount of money it provides LEAs to build and sustain school facilities. It is time to move past formulas that tie school quality to ZIP codes.

## SOLUTION #1: REINSTATE AND FUND THE GENERAL EDUCATION LEVY

Minnesota can solve many problems by changing the formula used to fund school capital investments. The state once used a general education levy to ensure all districts, regardless of their tax base, had the means to provide a quality education to their students. Unfortunately, lawmakers ended this levy from 2003 through 2012. Strom (2018) has documented that the levy returned under the name “student achievement levy” but “the 2015 Legislature repealed this levy beginning in fiscal year 2019” (Strom, 2018, pp. 10-11). Table 3.1 shows the revenue available for statewide use when a general education levy is in place. The lack of a general education levy has resulted in disparities across districts in terms of access to revenue. Property-poor districts reliant on voter-approved levies are less likely to have revenue for across-the-board operational needs, especially capital improvements. Many districts, especially rural Minnesota, would benefit from changing the current funding formula.

TABLE 3.1: GENERAL EDUCATION LEVY FIGURES 1988-2017 (AND LATER)

YEAR CERTIFIED	YEAR LEVY PAID	FISCAL YEAR	ADJUSTED NET TAX CAPACITY RATE	DOLLARS RAISED STATEWIDE
2017 and later	2018	2019	0.00%	0\$
2016	2017	2018	0.16%	\$10,000,000
2015	2016	2017	0.30%	\$20,000,000
2014	2015	2016	0.33%	\$20,000,000
2013 *	2014	2015	0.35%	\$20,000,000
2000	2001	2002	32.38%	\$1,330,000,000
1999	2000	2001	35.78%	\$1,330,000,000
1998	1999	2000	36.58%	\$1,285,500,000
1997	1998	1999	36.9%	\$1,292,000,000
1996	1997	1998	37.4%	\$1,359,000,000
1995	1996	1997	40.8%	\$1,359,000,000
1994	1995	1996	34.2%	\$1,055,000,000
1993	1994	1995	34.9%	\$1,044,000,000
1992	1993	1994	30.7%	\$969,000,000
1991	1992	1993	27.9%	\$916,000,000
1990	1991	1992	26.4%	\$840,000,000
1989	1990	1991	26.3%	\$792,000,000
1988	1989	1990	29.3% **	\$1,100,580,000

\*There was no general education levy for taxes payable in 2002 through taxes payable in 2013.

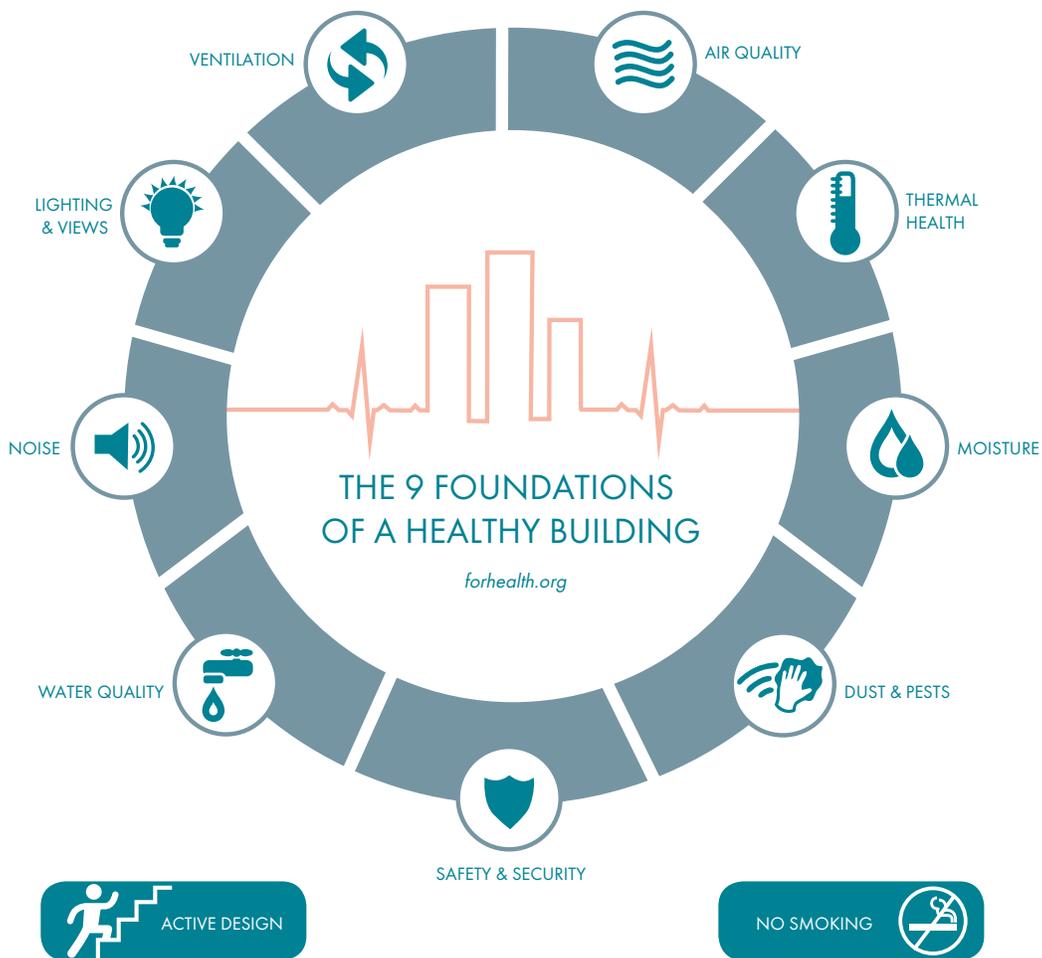
\*\*Adjusted gross tax capacity. Table reproduced from (Strom, 2018, p. 11).

## SOLUTION #2: INSTRUCT ALL SCHOOLS TO ADOPT POLICIES IN LINE WITH “THE NINE FOUNDATIONS FOR A HEALTHY BUILDING”

Researchers at Harvard T.H. Chan School of Public Health have developed a framework to guide the creation of health schools. Image 3.1 depicts the nine interlocking elements. Lawmakers should help LEAs ensure their schools meet the benchmarks in each area set by these researchers.

School buildings clearly influence “health and academic performance.” And we echo the call of the Harvard researchers who have argued that “investing in school buildings is an investment in our collective future” (Healthy Buildings program, p. 32).

IMAGE 3.1: BENCHMARKS FOR HEALTHY SCHOOLS



\*The nine benchmarks in table 3.1 come from *Schools for Health: Foundations for Student Success*, a report from the Harvard T.H. Chan School of Public Health. [www.forhealth.org](http://www.forhealth.org). (Healthy Buildings program, p. 9). Image 3.1 reproduced with permission from the Healthy Buildings program at Harvard T.H. Chan School of Public Health.

### SOLUTION #3: REQUIRE ALL NEW MINNESOTA SCHOOL FACILITIES TO USE GREEN CONSTRUCTION PRACTICES

LEAs will save money by building environmentally conscious, green buildings. Researchers have shown that future savings will offset any higher upfront construction costs. State lawmakers should require all new construction to follow green building standards. Metzger (2017) has argued “requiring new school construction projects to be green demonstrates a commitment to fiscal responsibility, promotes green jobs, and encourages healthy, high-performance facilities for students and teachers” (p. 3). Minnesota should require all new school construction to be “certified by a rating system with third party verification, such as LEED” (Metzger, 2017, p. 3). This will ensure that “taxpayers, parents, and students can be certain the building has been constructed for maximum efficiency to reduce operating costs, and designed with occupant health in mind” (Metzger, 2017, p. 3). Green buildings save money and make for better learning environments. Minnesota must move in the direction of green schools.

### SOLUTION #4: DIRECT LEAs TO CONDUCT REGULAR ENERGY AUDITS OF ALL SCHOOL FACILITIES

LEAs can solve some infrastructure funding gaps with simple data collection. Minnesota should pass legislation “requiring energy audits or emissions reduction plans” on a regular basis (Metzger, 2017, p. 5). Metzger has argued this will “give school districts a statistical foundation upon which they can base retrofitting projects or other green plans for their respective schools buildings” (p. 5). She provided Energy Star Portfolio Manager as a potential tool to help with this process. She described the benefits by writing,

Energy Star Portfolio Manager...is a free online tool that allows building owners to track and assess energy and water consumption, performance and cost information for individual buildings and building portfolios. Energy Star is also the required benchmarking platform for validating building performance in the LEED for Existing Buildings: Operations and Maintenance rating system. (Metzger, 2017, p. 5)

Minnesota SF1510, which failed in the 2017 legislative session, mandated that all public schools report energy consumption to a state data-tracking agency. This bill was a simple step toward a green solution for LEAs. Lawmakers should reconsider this legislation.

## SOLUTION #5: PROVIDE FINANCIAL ASSISTANCE TO DISTRICTS WISHING TO EXCEED GREEN BUILDING STANDARDS

We have documented that green construction will save money for the state and LEAs. Minnesota can incentivize LEAs to embrace green construction with financial assistance. In 2013, Minnesota HF270 failed in the Legislature. It would have established “the school energy conservation revolving loan program to provide financial assistance to school districts to make energy improvements in school buildings that reduce statewide greenhouse gas emissions and improve indoor air quality in schools” (Metzger, 2017, p. 7). Lawmakers should revisit this bill because the “use of renewable energy sourced at the school building itself, such as solar or geothermal power, can promote significant energy efficiency and cost cutting benefits for both the school and the district” (Metzger, 2017, p. 7).

## SOLUTION #6: REQUIRE LEAs TO RECYCLE, COMPOST, ELIMINATE TOXINS FROM SCHOOLS, AND DEVELOP PLANS TO REDUCE CONSUMPTION

It sounds dated, but Minnesota communities can still improve efforts to increase recycling, waste reduction, and composting. Researchers have proven that “recycling and reduced consumption continue to be two simple and proven ways to reduce the production of solid and hazardous waste” (Metzger, 2017, p. 8). We support Metzger’s (2017) recommendation that “state legislators can introduce bills that mandate the creation of recycling programs for school districts or large communities, with funding incentives to offset costs” (p. 8). Minnesota needs to promote recycling and composting as cost-saving tools for districts.

In addition, Minnesota could follow the lead of 10 states and the District of Columbia who have adopted “a green cleaning policy” for schools, which improves “the indoor environmental quality for students, teachers, and staff, reducing instances of asthma and other illnesses that are a major cause of absenteeism” (Metzger, 2017, p. 9). Metzger (2017) has argued, “A green cleaning policy can include safer operations for custodial staff, a healthier indoor environment for building occupants” (p. 9). Beyond cleaning supplies, LEAs should follow “an integrated pest management plan,” which would “protect students, teachers, and staff by reducing the application of harmful pesticides” (Metzger, 2017, p. 11). Minnesota HF270 would have also allowed LEAs to use funds for this type of effort to improve indoor air quality. Schools can make drastic changes for the better with more state funds.

## SOLUTION #7: CALL FOR LEAs TO CONDUCT BETTER MAINTENANCE OF CURRENT BUILDINGS

Many Minnesota schools are in desperate need of repairs and retrofitting. In the *2016 State of Our Schools* report, Filardo (2016) “estimated that districts were carrying at least \$271 billion in deferred maintenance and repairs. When including requirements for alterations and scheduled renewals of existing facilities, the estimated price tag doubled to \$542 billion” (p. 12). Ciolino has posited, “One of the main reasons for the current inadequacy of public school buildings is the failure to properly maintain these buildings over time. Studies have recognized the current system of public school maintenance as a ‘run-to-fail system’” (p. 129). Scholars have cited that best practice calls for setting aside “2-4% of the total value of the school on maintenance each year” (Ciolino, 2016, p. 129). Minnesota lawmakers should mandate LEAs budget for future improvements because even though “setting aside millions of dollars a year for maintenance of school buildings sounds expensive, it is substantially cheaper than allowing new and recently renovated buildings to deteriorate” (Ciolino, 2016, p. 129).

## SOLUTION #8: JOIN A FEDERAL COALITION ASKING THE FEDERAL GOVERNMENT TO COLLECT BETTER INFRASTRUCTURE DATA WITHIN THE U.S. DEPARTMENT OF EDUCATION

The federal government needs to do a better job of collecting data on the physical structures housing public school students and educators. Minnesota should join a federal coalition to press the U.S. Department of Education to collect and report this data. Filardo (2016) has argued:

addressing the nationwide funding gap requires that the American public and policymakers better understand the conditions in their own schools and how these facilities impact student and teacher health and performance, the environment, the local economy, and overall community vitality. A key requirement is to have better data on public school infrastructure. (p. 28)

Ciolino (2016) complained that “there actually are more people working on school facilities within the Environmental Protection Agency and the Department of Energy than within the Department of Education” (p. 127). We share this frustration and support efforts to encourage the Department of Education “to create an Office of School Facilities to ensure accountability that funding is properly utilized and inventories are properly maintained” (Ciolino, 2016, p. 127). This would be a vital step toward gathering the information needed to direct real and meaningful change for students and educators.

## SOLUTION #9: GIVE LEAs THE FUNDING NEEDED TO RESPOND TO CLIMATE CHANGE

Minnesota lawmakers need to have a serious conversation about how climate change is stressing learning environments. Summers are hotter and longer and too many students suffer in buildings without air conditioning. Winters are also growing colder and snowier, and school buildings are deteriorating because of weather stress. Climate change is real, and it is making life difficult for educators and students.

## SOLUTION #10: STOP BUILDING SCHOOLS THAT LOOK LIKE PRISONS

Many schools in the United States, including structures like South High School in Minneapolis, were built by the same architects who also designed prisons. Valencia (2018) cited the comments of Frank Locker, a respected architect, who framed the issue like this:

In the U.S., many of the same people who designed prisons also designed schools. What comes to mind when you see a long hall of closed doors, that you can't be in without permission, and a bell that tells you when to come in, when to leave, when class starts, when it ends? What does that look like to you?

This architect has argued that schools must "have the necessary space and tools to meet in groups of all sizes and participate in active learning" (as cited by Valencia, 2018). Anaxu Zabalbeascoa added to this sentiment by saying "the best learning spaces are those that have been designed with everyone in mind, that establish a relationship between the space and the outside world" (Valencia, 2018). It is important to design schools for students and educators. Minnesota needs to move beyond industrial buildings that resemble prisons.

## SOLUTION #11: RETROFIT ALL MINNESOTA SCHOOLS WITH AIR CONDITIONING

It is unacceptable that many students must suffer through rising temperatures in buildings without air conditioning. It is even more problematic that districts cancel school due to excessive heat. Cedeño Laurent and colleagues (2018) have warned that "Health effects of heat stress due to climate change, manifested as cognitive function deficits, extend to larger sectors of the population and can have significant implications on educational attainment, economic productivity, and workplace safety" (p. 15). Walker (2018) confirmed that researchers have shown that "each 1°F increase in school year temperature reduces the amount learned that year by one percent (or the equivalent of being absent for two days)" (Walker, 2018). In addition, students of color disproportionately attend schools without air conditioning. Lawmakers must provide funding to retrofit all school facilities with air conditioning.

## SOLUTION #12: ENSURE ALL SCHOOL PLAYGROUNDS ARE SAFE AND ACCESSIBLE FOR ALL STUDENTS

The U.S. Consumer Product Safety Commission has “estimated that there were more than 200,000 injuries annually on public playgrounds across the country that required emergency room treatment” in the 2013-2014 school year (U.S. Consumer Product Safety Commission, December 2015, p. 1). Lawmakers should retrofit all existing playgrounds and require all new playgrounds to meet the the recommended guidelines for safe playgrounds from the U.S. Consumer Product Safety Commission.

## SOLUTION #13: REQUIRE LEAs TO MONITOR AND IMPROVE AIR QUALITY IN ALL BUILDINGS

The Center for Green Schools and the U.S. Environmental Protection Agency (2011) have estimated that “more than 46% of U.S. public schools have environmental conditions that contribute to poor indoor environmental quality, including allergens and respiratory irritants that can cause asthma, headaches, nausea, weight gain, general irritation and cognitive impairment” (Center for Green Schools). The Center for Disease Control has also confirmed, childhood asthma “is the leading cause of student absenteeism and accounts for 13.8 million missed school days each year, according to the Centers for Disease Control and Prevention” (Center for Green Schools). The state should provide resources to help LEAs monitor and improve air quality in schools.

## SOLUTION #14: PROVIDE THE RESOURCES LEAs NEED TO BUILD INCLUSIVE SCHOOLS

We have documented that schools fail to provide adequate accommodations for all students. Lawmakers should provide funding to help all schools:

1. Create safe spaces for transgender and gender nonconforming students.
2. Give special education programs enough space to provide all necessary interventions.
3. Provide Level IV settings for students who need space accommodations.
4. Build schools that meet the specific needs of educating preschool children.
5. Offer space to Early Childhood Family Education programs.
6. Help improve compliance with the Americans with Disabilities Act in all schools.

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