

Building Healthy Schools

Health Impact Assessment on Planning
School Construction Projects in Minnesota

JANUARY 2015





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Table of Contents

ACKNOWLEDGEMENTS	III
EXECUTIVE SUMMARY	1
Purpose and Background	1
How this HIA Was Conducted	3
Existing Conditions — Key Findings	4
HIA Recommendations for Proposed Changes to the <i>Guide</i> and Anticipated Changes in Health Behavior and Outcomes	6
INTRODUCTION	10
About this HIA	13
SCOPING	17
Populations Affected	17
Stakeholder Involvement in the HIA	18
Identifying and Prioritizing Determinants of Health	19
Defining the Project’s Scope and Prioritizing Research Questions	19
ASSESSMENT	21
Methods	21
Health and Academic Achievement: A Focused Review of the Literature	24
Current Conditions	27
Current Health-promoting Practices among Minnesota K–12 Schools	33
Current School Facilities’ Planning Processes	41
Anticipated Reach	43

RECOMMENDATIONS: PREDICTED HEALTH IMPACTS AND RECOMMENDED REVISIONS TO THE GUIDE	46
Creating Decision Points and Predicting Health Impacts	46
Developing Recommendations for Revisions to the <i>Guide</i>	47
Framing Recommendations for Changes to the <i>Guide</i>	47
Food Environment: Predicted Health Impacts and Recommendations	50
Location Efficiency: Predicted Health Impacts and Recommendations	58
Physical Activity: Predicted Health Impacts and Recommendations	65
Inclusive Decision-making: Recommendations	71
RECOMMENDATIONS: COMMENCING THE REVISION PROCESS AND RELATED CONSIDERATIONS	75
Secure Resources for Revising the <i>Guide</i> and Schedule the Revision Process	75
Expand Stakeholder Participation in Revising the <i>Guide</i>	75
Support School Finance Reform (<i>Section I, Parts 1.02 and 1.03</i>)	76
Add Content to the MDE Report Card	76
Inventory Minnesota K–12 Public Schools and Create a Database (<i>Section I, Part 1.01</i>)	76
Monitor and Evaluate Implementation of Best Practices Recommended in the <i>Guide</i>	77
MONITORING AND EVALUATION	78
REFERENCES	79
APPENDICES	88
Appendix I: Glossary	88
Appendix II: Resources	92
Appendix III: Case Studies A and B	100
Appendix IV: Rationale for Estimated Number of Schools Directly Impacted Each Year	106
Appendix V: Federal and State Policies and Initiatives that Promote Student Health	107
Appendix VI: Letters of Support	110
Appendix VII: Illustrative Exhibit, Food Environment	119

Executive Summary

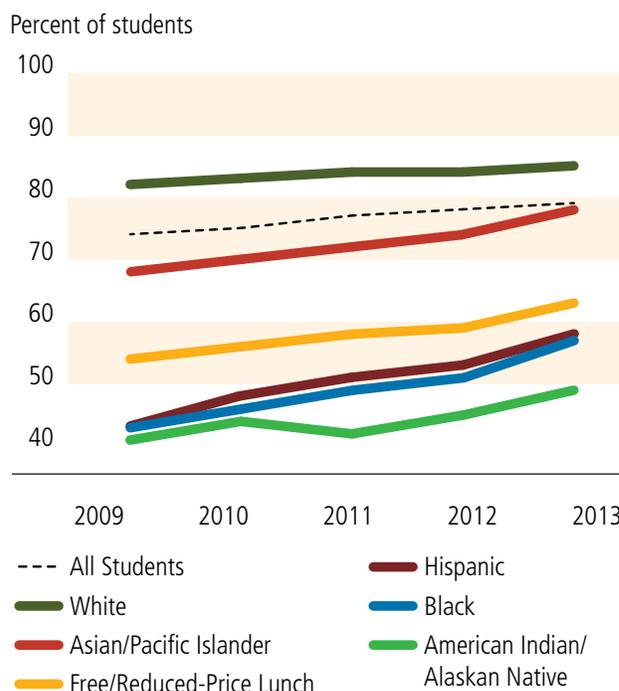


Purpose and Background

Where students learn matters — the quality and safety of a school’s indoor and outdoor spaces, the range of services the school offers, how close the school is to students’ homes and other frequently visited places such as libraries, parks, recreation or community centers, child care centers, health clinics, and grocery stores, and the types and ease of transportation options, are all important factors that contribute to students’ ability to thrive in school settings. Health is critical not only to students’ academic success, but also to their physical and emotional well-being.

Although Minnesota has a well-earned reputation for excellence in education, substantial disparities persist in educational outcomes and school financing (Figure 1). Children and adults who live in poverty or in under-resourced areas often experience disparities in access to quality schools, safe, multi-modal transportation options,

FIGURE 1: Minnesota 4-year high school graduation rates, by race/ethnicity and socioeconomic status



Note: MDE calculates the rate as the number of students who graduate within four years of entering 9th grade.

Source: MDE, statewide graduation rates, 2009-2013

healthy food, quality health care, and safe, inviting places to play. Certain subpopulations may feel the effects of decisions about [school siting](#) and construction more so than others — including communities of color, lower-income households, the disabled, individuals with pre-existing health conditions, rural residents, or any other priority population that may be less able to participate in decisions that impact their lives or lack the resources necessary to avoid unhealthy elements in their environments.

Given the considerable amount of time children spend in school, decisions about school construction and siting have the potential to greatly affect the health of all Minnesota K–12 students, numbering nearly 851,000, and the health of all others who work at or use these school facilities. It is therefore essential to consider the health impacts on student and community populations when making substantial, long-term investments in grades K–12 infrastructure.

This [Health Impact Assessment \(HIA\)](#) (HIA) uses a health lens to analyze how specific sections of the Minnesota Department of Education (MDE) [Guide for Planning School Construction Projects in Minnesota](#) (*Guide*) may affect student and community health. The *Guide* is a user-friendly compilation of laws, regulations, design standards, and best practices. MDE developed the *Guide* in 1988; a major revision was done in 1998–99, followed by a modest revision in 2002–03. Due to lack of resources, the *Guide* has not been revised since that time. Use of the *Guide* by school districts is recommended, but not required.

A fundamental purpose of the *Guide* is to help school districts make well-informed decisions that will enhance student achievement and strengthen school and community partnerships. *To the extent it is kept current*, the *Guide* can be an indispensable resource for school district administrators, teachers and support staff; architects, engineers, and facilities planners; regional planners; public health officials; transportation and zoning experts; and parents, students, and community stakeholders. Its content is intended to be accessible to members of the general public. As the *Guide* has become outdated, it is increasingly falling into disuse among key participants in school construction and siting planning processes, including architects, planners, school administrators, and facilities experts.

Although revision of the *Guide* is anticipated, a revision process has not yet been scheduled by MDE and no apparent resources have been set aside for that purpose. The HIA report and recommendations may help get the revision process started and provide guidance once it gets underway. In addition, the HIA report and recommendations can be put to immediate use by any school district that is

Note: click on the red underlined text found throughout this document to jump to glossary definitions in Appendix I and all other appendices.

HEALTH IMPACT ASSESSMENT (HIA)

is commonly defined as “a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population” (European Centre for Health Policy, 1999).

HIA can be used to evaluate objectively the potential health effects of a project or policy before it is built or implemented. It can provide recommendations to increase positive health outcomes and minimize adverse health outcomes. A major benefit of the HIA process is that it brings public health issues to the attention of persons who make decisions about areas that fall outside of traditional public health arenas, such as transportation or land use.

contemplating or planning a school construction project in Minnesota and in other states. Many states have guides of their own; however, among states, guidance that considers health impacts is just beginning to emerge.

Since 2003, changes to federal, state, and local laws, and an influx of ambitious public health initiatives — many aimed at reversing the nation’s childhood obesity epidemic, reducing related chronic diseases, and eliminating health disparities — have greatly affected school environments ([Appendix V](#)). These changes have signaled a need to update and expand the *Guide* to help stakeholders make well-informed school siting and construction design decisions that can support academic success by optimizing student and community health.

It is important to keep in mind that many factors beyond school siting and construction design influence student health behaviors and outcomes. A school’s location and design will establish a foundation that can help or hinder programming efforts to improve student health and wellness. Success ultimately comes from a combination of sources including designs that promote health, use of evidence-based practices, and strong support from all parts of the school community.

How this HIA Was Conducted

This HIA was conducted from fall 2013 through fall 2014 by a core team from the Public Health Law Center at William Mitchell College of Law and Wilder Research in St. Paul, Minnesota, with in-depth guidance and participation of a steering committee of 15 stakeholder representatives, plus input from several other external advisors and experts in HIA process. The full report summarizes all six steps of the project’s HIA (Figure 2), and focuses on the project’s analysis, findings, and recommendations.

FIGURE 2: The Steps of HIA

1 SCREENING

Determine whether an HIA is needed and likely to be useful.

2 SCOPING

In consultation with stakeholders, develop a plan for the HIA, including identification of potential health risks and benefits.

3 ASSESSMENT

Describe the current health of affected communities and assess the potential health impacts of the decision, policy, or process being studied.

4 RECOMMENDATIONS

Develop practical solutions or changes that can be made within the political, economic, or technical limitations of the project, policy, or process being assessed.

5 REPORTING

Share the findings with decision makers, affected communities, and other stakeholders.

6 MONITORING AND EVALUATION

Monitor changes in the health or the health risk factors of affected communities, and evaluate the effectiveness of the measures that are implemented and the HIA process as a whole.

The HIA process encourages public input at each step.

Source: Adapted from The Pew Charitable Trusts, <http://www.pewtrusts.org/en/about/news-room/news/2014/08/28/the-hia-process>

The project’s core team collected and analyzed data from several sources to help address gaps in knowledge about current conditions in Minnesota K–12 schools, assess the impact of proposed revisions to the *Guide*, and support the development of the HIA recommendations. A focused literature review was conducted to determine potential health impacts associated with proposed changes to the content of the *Guide*. The core team reviewed Minnesota’s *Guide*, guides developed by other states and non-profits, and related reports and recommendations. Sources of secondary data were reviewed to understand students’ current health status and the current health-promoting policies and practices used by schools. Primary data collection methods including online surveys, key informant interviews, and school case studies were used to gather additional information about health-promoting practices currently used by schools, barriers to implementing health-promoting practices and policies, and the degree to which health has been considered in recent school construction and renovation projects. The development of the HIA recommendations has been informed by the literature review, the assessment findings, and feedback from steering committee members and other advisors.

Existing Conditions — Key Findings

Current Health Status of Minnesota K–12 Students

- There is a strong association in Minnesota between positive health behaviors such as physical activity, fruit and vegetable consumption, and measures of student academic performance such as high grades and few disciplinary actions.
- Across a number of indicators of health and academic achievement including obesity and diabetes, students of color and students from lower-income households tend to have poorer outcomes.

Current Health-Promoting Practices among Minnesota K–12 Students

- A number of schools are implementing programs and policies to encourage healthy eating and physical activity among students.
- Schools use multiple strategies to increase physical activity among students, including quality physical education classes, athletics programming, Safe Routes to School (SRTS), and active classroom practices.
- Changes in vending machine and classroom snack policies are used more frequently by schools to create a healthy food environment than broader initiatives such as those that affect the types of food served at meals.
- School construction and design can address some of the main barriers to supporting physical activity and healthy eating behavior among students.
- By constructing facilities and designing interior and exterior spaces that create a healthy environment, schools can begin to address underlying factors that may contribute to health inequities among students.

Current School Facilities Planning Processes in Minnesota

- During a new construction or major renovation planning process, school administrators and other stakeholders focus on designing spaces that will provide rich learning environments for students, sometimes taking community use into account as well. Less emphasis has been placed on considering how the design of school spaces supports student and community health and the reduction of health disparities.
- School design and planning processes do not regularly involve city, county, and regional planners, park board members, or local public health department staff. As a result, local stakeholders with valuable experience and expertise in considering ways to optimize student health may not have meaningful opportunities to influence the school's design or to explore potential community partnership opportunities, particularly in the early planning phases.
- Community residents are not regularly involved in school districts' early discussions about school siting and design plans.

Anticipated Reach

- Nearly 851,000 students attend public schools in Minnesota. Given the amount of time students spend in school each year, schools are uniquely positioned to foster positive student health behaviors.
- The overall age of Minnesota K–12 school buildings suggests a great need for improvements to and/or replacements of school facilities across the state. Sources of information rating or describing how the school environment and building design fosters or impedes healthy behavior are not readily available.
- Each year, relatively few new school construction or major renovation projects take place. These types of projects are most likely to be directly influenced by a major revision of the *Guide*. It will be important for stakeholders to consider student health as they assess and prioritize their future facility needs.
- There is a risk that a revision to the *Guide* may exacerbate health inequities and differences in academic achievement between school districts. Funding for new construction and major renovation projects may be easier to secure in more affluent communities with a larger tax base. Yet, schools with the greatest needs for improvements may be located in districts far less likely to receive voter approval for a new project.

HIA Recommendations for Proposed Changes to the *Guide* and Anticipated Changes in Health Behavior and Outcomes

Because the process of revising the *Guide* has not yet begun, the HIA core team developed hypothetical proposed changes to the *Guide* to create clear decision points to be the focus of the assessment. These proposed changes fell into four broadly stated categories: **food environment**; **location efficiency** (defined to include transportation access, shared use, and intergovernmental collaboration); **physical activity**; and **inclusive decision-making**. After considering the health impacts likely to occur if these revisions were incorporated into the revision of the *Guide*, recommendations were developed that offer suggestions for language to be adopted in the *Guide* revision and in changes to the revision process itself that optimize student health. The proposed changes to the *Guide* that are summarized below are geared toward facility planners, architects, and designers; school district and school site administrators, teachers, and support staff; students, parents, and community members; public health staff, transportation planners, and other local government staff; policymakers; and state agency staff and officials.

All of the recommendations summarized below align with the results of the assessment step, reflect best practices identified in the literature review, and incorporate guidance from HIA steering committee members and other content experts. A more detailed presentation of these recommendations, and additional recommendations, is provided in the full report, including recommendations that do not propose content changes to the *Guide* but, instead, recommend taking steps to ensure the *Guide* is updated periodically and made more accessible to the public. Here, we present some of the most significant proposals for changes to the content of the *Guide*.

RECOMMENDATIONS FOR CHANGES TO THE *GUIDE* TO IMPROVE THE SCHOOL FOOD ENVIRONMENT

The following proposed changes to the *Guide* would allow school food services staff to store, prepare, and serve more fresh, healthy foods, including fruits and vegetables, and increase the steady availability of healthy food items. They would also provide more specific guidance than currently exists in the *Guide* to help planners, school food service staff, and others consider ways to improve student health and maximize the learning potential of the school food environment. *(Note: Please see the full report for the complete text of these, and additional, recommendations.)*

Improving the School Food Environment

- Add specific guidance for preparing school meals and snacks **from scratch**, using fresh ingredients.
- Include specific examples of designs that increase the availability and consumption of healthy foods and maximize student time for eating and socializing, including guidance on the number of students per lunch service line and prominent, well-placed displays of fruits and vegetables.
- Consider including design specifications for or examples of **"scramble design"** stations for secondary school students.
- Include specifications for a salad/fruit and vegetable bar.

Anticipated changes in health behaviors and outcomes: The literature review found strong evidence that implementing these changes would lead to greater consumption of fresh fruits and vegetables and promising evidence that the changes would increase participation in the school meal program, improved classroom attention, and reduced absenteeism among students. More research is needed to predict the degree to which these changes will result in long-term academic success and overall reductions in student overweight and obesity.

RECOMMENDATIONS FOR CHANGES TO THE *GUIDE TO IMPROVE LOCATION EFFICIENCY*

The proposed revisions emphasize the relationship between a school's location and the community it serves and encourage consideration of all forms of transportation to school, not only transportation by automobile and bus. The proposed changes, and the additional HIA recommendations discussed in the full report, focus on influencing decisions concerning the amount of land needed for a school facility and grounds and guidance regarding the proximity of schools to students and community users. The recommendations show particular potential for strengthening school-community relationships, a stated goal of the *Guide*. (Note: Please see the full report for the complete text of these, and additional, recommendations.)

Improving Location Efficiency

- Remove minimum acreage text but encourage planners to consider adequacy of spaces for outdoor play, shared use agreements, future expansion needs, on-site storm water drainage, and well-planned student arrival/departure areas.
- Revise school siting guidance to include maximizing the number of students who live within a school's walk zone, and re-define "center of community/school district" to mean a location near current or anticipated centers of student population growth.
- Recommend conducting a walkability/bikeability assessment when a new school site is being considered, including discussion of plans to address infrastructure challenges.
- Provide guidance to help school districts explore options for co-locating a school facility with another community asset, e.g., a park building, recreation/community center, health center, or public library.

Anticipated changes in health behavior/health outcomes: The literature review found strong evidence that the proposed revisions to the *Guide* would lead to increases in student physical activity if the infrastructure surrounding a school provides students with safe walking and biking routes. In addition, there is promising evidence that when students are able to walk or bike to/from school, they are more attentive in their classes and achieve better academic outcomes. More research is needed to understand whether these changes will ultimately lead to changes in rates of student overweight and obesity.

RECOMMENDATIONS FOR CHANGES TO THE *GUIDE TO IMPROVE PHYSICAL ACTIVITY*

The current *Guide* provides little guidance on how indoor and outdoor school spaces can be best utilized to support and encourage physical activity among students, staff, and community members. The recommendations for proposed changes to the *Guide* emphasize the importance of providing specific guidance on the design of spaces with this goal in mind. (*Note: Please see the full report for the complete text of these, and additional, recommendations.*)

Improving Physical Activity

- **Athletic facilities:** Change the square footage guidance to reflect capacity needs for physical education instruction and physical activity during the school day, and consider, separately, gymnasium space needs for team practices, community use, afterschool activities, and opportunities for shared use with community facilities that can leverage available spaces.
- **Active classroom:** Recommend design features that support active classrooms such as guidance on easily movable classroom furniture and configurable learning spaces that enable physical activity breaks, flooring and acoustical materials that reduce distracting noise, and placement of classrooms in close proximity to outdoor spaces and/or an indoor commons area that can be used for brief periods of physical activity.
- **Use of school grounds:** Recommend designing outdoor activity areas to include natural landscape and **green spaces** and, for elementary and middle schools, play areas with hard surface areas for organized/competitive sports, playground equipment, and green spaces for unstructured play and outdoor education curricula.

Anticipated changes in health behavior/health outcomes: The proposed changes to the *Guide* would encourage schools to design indoor and outdoor spaces to be used for a range of activities that would likely appeal to the varying interests of a diverse student body and to better estimate the spaces needed to meet school and community needs for places to be physically active. There is strong evidence that the proposed changes would result in increased levels of physical activity if the enhanced indoor and outdoor spaces are used for physical activity by the school, and promising evidence that improved classroom attentiveness, academic performance, and mental health outcomes could also result from these changes. More research is needed to determine whether these proposed changes could result in long-term reductions in student overweight and obesity.

RECOMMENDATIONS REGARDING INCLUSIVE DECISION-MAKING

The recommendations on inclusive decision-making address cross-cutting topics that support the *Guide's* central aim — to help school districts design healthy schools that foster academic success and physical and emotional well-being while also strengthening community partnerships, student and family involvement, and community cohesion. *(Note: Please see the full report for the complete text of these, and additional, recommendations.)*

Inclusive Decision-making

- Strengthen the statement of purpose of the *Guide* to explicitly adopt a Health in All Policies approach to school construction and siting planning and decision-making processes.
- Encourage school districts to expand the scope of participants in the planning process.
- Encourage school districts to publicize their plans to support pedestrian, bicycle, and transit connections; maximize cooperative use and inter-governmental and non-profit collaborations; and consult with local or state transportation officials to address multimodal access and safety.
- Identify and encourage opportunities for intergovernmental collaboration and information-sharing.
- Encourage school districts to emphasize health considerations in facilities plans submitted to MDE, if applicable, and in school wellness policies.



ATS&R PLANNERS/ARCHITECTS/ENGINEERS

Introduction



America’s K–12 public school system is a cornerstone of our democracy, promising each new generation of students equal access to safe, healthy, and productive places to learn and grow, academically and socially, in preparation for the challenges and civic responsibilities of adulthood. Careful investment in K–12 educational facility and grounds infrastructure is central to delivering on that promise.

Where students learn matters — the quality and safety of a school’s indoor and outdoor spaces, the range of amenities and services it offers, the proximity of the school to students’ homes and connectivity to other key locations, and the modes and ease of transportation access are important factors, social determinants of health, that contribute to academic excellence. Health is critical not only to students’ academic success, but also to their physical and emotional well-being.

Although Minnesota has a well-earned reputation for excellence in education, the state is grappling with

Note: click on the red underlined text found throughout this document to jump to glossary definitions in Appendix I and all other appendices.

substantial disparities in educational outcomes (Figure 1). Despite notable gains between 2012 and 2013, the 2013 gap in graduation rates between white students (85%) and students of color and lower-income students remained deep, overall: American Indian (49%); Asian (78%); Black (57%); Hispanic (58%); students who qualify for free/reduced-price lunch (63%). Disparities also persist in the sphere of school financing. The Minnesota Department of Education (MDE) is making concerted efforts to address gaps in academic achievement through various programming efforts and has [recommended enactment of financing reforms](#) to ensure that all districts have equitable access to revenue and to prioritize grant programs that support student health outcomes in communities with the greatest needs.

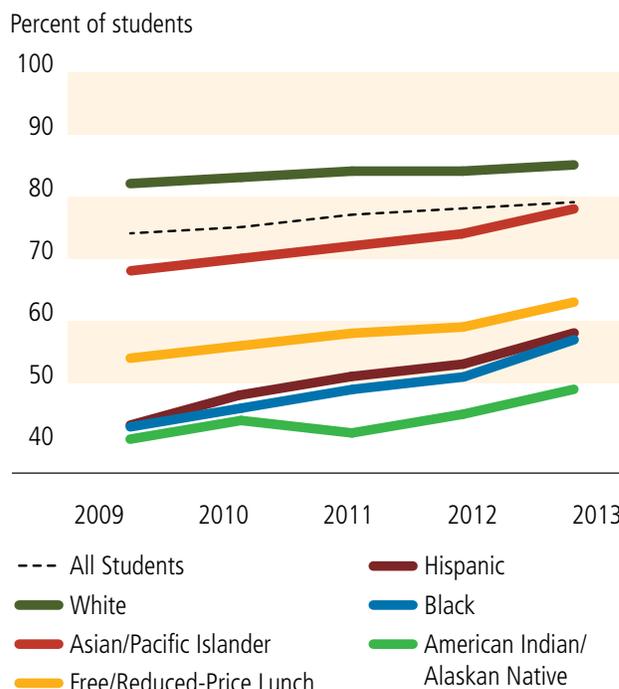
Children and adults who live in poverty or reside in under-resourced communities often experience disparities in accessing quality schools, safe and multi-modal transportation, healthy food, health care, and safe and inviting recreational settings.

Because school construction and siting decisions greatly affect the health of all Minnesota school children of all backgrounds and in all communities, it is essential to consider health impacts on student and community populations when making investments in school facilities infrastructure.

The complex process of planning and deciding whether to retire, renovate, or repurpose an existing facility, where to situate a new school building, and how to design indoor and outdoor spaces to best support academic excellence, is at the heart of a school district’s careful investment. Given the breadth of complexities involved in planning, many states, including Minnesota, publish school facilities guides to help school districts navigate the process and make fully informed decisions.

Minnesota’s [Guide for Planning School Construction Projects in Minnesota](#) (*Guide*) was last revised in 2002–03. The *Guide* is a compendium of laws, regulations, design standards, and best practices that affect school district planning and decision-making for site selection, new construction, and major renovations. A goal of the *Guide* is to present information in a user-friendly way that will help all stakeholders become informed about the planning process. Use of the *Guide* by school district is encouraged by MDE, but not required. The intent is to provide “design ideas and essential elements” for school districts to consider, but not to be prescriptive. A fundamental goal of the *Guide* is to encourage decision-making processes that will enhance student achievement as well as school-community partnerships. The 2003 edition of the *Guide* encourages planning committees “...to

FIGURE 1: Minnesota 4-year high school graduation rates, by race/ethnicity and socioeconomic status



Note: MDE calculates the rate as the number of students who graduate within four years of entering 9th grade.

Source: MDE, statewide graduation rates, 2009-2013

be visionary and creative in making design and space decisions and continually ask: ‘*what will our students-staff-community users need now and in 10–20 years to help them succeed?*’” (2003 *Guide*, p. viii.)

Although use of the *Guide* is not mandated, *to the extent it is kept current* it can be indispensable to school districts, regional and state planners, local public health, transportation, zoning, and other government officials, as well as MDE and other state agencies. Without clear guidance, the complexity of legal requirements, standards, best practices, and designs can be difficult to keep track of and convey effectively to the large number of people who contribute to the planning process, many of whom lack particularized expertise.

In principle, a school district’s use of the *Guide* makes it far more likely that its proposed project will be in compliance with all applicable laws and standards and reflect best practices guidance, thereby fostering a truly vibrant, healthy, safe, and sustainable place of learning and activity. Unfortunately, Minnesota’s guide has become outdated and is increasingly falling into disuse among key stakeholders, namely, school officials and design and construction experts who arguably hold great sway in influencing siting and design decisions.

Since the last revision of the *Guide* in 2003, an upsurge in changes to federal, state, and local laws, and the introduction of far-reaching public health initiatives — many aimed at reversing the nation’s childhood obesity epidemic, reducing the incidence of related chronic diseases, and achieving [health equity](#) — have greatly affected school environments and generated interest in considering how construction and design decisions can impact health outcomes, e.g., the emergence of healthy eating design guidelines (Huang, et al., 2013). There are many prominent examples of policies and initiatives relevant to public school K–12 school settings ([Appendix V](#)).

In light of these advancements and related changes in law and policy, stakeholders need additional guidance about how school construction and siting decisions can support academic success by optimizing student health — assistance that is currently lacking in the *Guide*. There has been notable momentum, too, in encouragement and use of sustainable and green building design standards and practices, as exemplified by the U.S. Department of Education’s Green Strides program and Leadership in Energy & Environmental Design ([LEED](#)) certification. All told, these many and varied changes are transforming K–12 public school environments — and fit squarely within the *Guide*’s main purpose of drawing attention to policies, standards, and practices that have strong potential to strengthen school construction and planning processes as well as outcomes, and promote academic gains and school-community partnerships.

There is no dispute regarding a need to update the *Guide*, although there are likely varying points of view regarding the scope of changes that can reasonably be considered when the *Guide* is next revised. MDE considers revision a priority and, in 2013, expressed its intention to begin the process in 2014, pending allocation of resources. The commissioners of MDE and the Department of Health (MDH) endorsed this project, providing [Letters of Support](#) ([Appendix VI](#)). MDE is not required by law to periodically revise the *Guide*, however, and the process has not been set in motion as of this writing.

About this HIA

The impetus for this project stems from a 2012 meeting of the Minnesota Healthy Kids Coalition, at which time a coalition member suggested conducting a **Health Impact Assessment (HIA)** to analyze how the *Guide* impacts student and community health and how it could be a valuable resource for advancing health equity aims in school settings. The coalition encouraged follow-through, which resulted in the development of this project. A revised *Guide* that takes health impacts and health equity directly into account in school construction planning processes and substantive guidance on best practices has the potential to benefit all Minnesota school districts and to serve as a model for other states.

PROJECT GOALS

The main goal of this HIA is to inform the next revision of the *Guide* by providing stakeholders with recommendations for changes that promote and enable positive health outcomes for student and community populations, consistent with the overall purpose of the *Guide*. In addition, the HIA report and recommendations are designed for immediate and direct use by school districts throughout the state to inform planning and decisions on projects. The HIA also aspires to provide guidance to stakeholders in other states.

Health in All Policies approach. This project uses a health lens, or **Health in All Policies** approach, to analyze how the current *Guide* affects student and community health and the social determinants of health (i.e., root causes or pathways). This HIA is somewhat atypical, in that it has been conducted *before* the commencement of the revision process it seeks to influence, albeit with the understanding that the revision process would likely begin either during or shortly after the HIA. Consequently, the HIA report and recommendations may help jumpstart the revision process, as well as inform the process once it gets underway.

Informing the next revision of the *Guide*. MDE has overseen the development of past editions and revisions of the *Guide* since at least 1988. The most recent major revision was made in 1998–99, at which time the *Guide* was renamed, and modest revisions were made in 2002–03; the combined effort involved about 70 stakeholder group representatives, including school administrators, planners, teachers and staff, engineers, architects, and representatives of several other state agencies. Some of those representatives (or their colleagues) have participated in this HIA, providing links to the past development of the *Guide*, as well links looking forward. The combination of the timing of the HIA, the engagement of community partners, and the issuance of the report and recommendations, will enable MDE and all contributors to the next revision an opportunity to contemplate several, meaningful health-promoting changes that might otherwise receive little attention, yet have the

HEALTH IMPACT ASSESSMENT (HIA)

is commonly defined as “a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population” (European Centre for Health Policy, 1999).

HIA can be used to evaluate objectively the potential health effects of a project or policy before it is built or implemented. It can provide recommendations to increase positive health outcomes and minimize adverse health outcomes. A major benefit of the HIA process is that it brings public health issues to the attention of persons who make decisions about areas that fall outside of traditional public health arenas, such as transportation or land use.

FIGURE 2: The Steps of HIA

1 SCREENING

Determine whether an HIA is needed and likely to be useful.

2 SCOPING

In consultation with stakeholders, develop a plan for the HIA, including identification of potential health risks and benefits.

3 ASSESSMENT

Describe the current health of affected communities and assess the potential health impacts of the decision, policy, or process being studied.

4 RECOMMENDATIONS

Develop practical solutions or changes that can be made within the political, economic, or technical limitations of the project, policy, or process being assessed.

5 REPORTING

Share the findings with decision makers, affected communities, and other stakeholders.

6 MONITORING AND EVALUATION

Monitor changes in the health or the health risk factors of affected communities, and evaluate the effectiveness of the measures that are implemented and the HIA process as a whole.

The HIA process encourages public input at each step.

Source: Adapted from The Pew Charitable Trusts, <http://www.pewtrusts.org/en/about/news-room/news/2014/08/28/the-hia-process>

potential to significantly strengthen the *Guide's* value to stakeholders and decision-makers.

Procedural steps. This HIA project ran from fall 2013 through fall 2014, and was staffed by a core team from the Public Health Law Center and Wilder Research in St. Paul, Minnesota. The core team recruited and partnered with a steering committee of fifteen individuals who represented diverse stakeholder groups, contributing expertise in the fields of school administration, facilities planning, regional and transportation planning, architecture, public health, health equity, health impact assessments, nutrition services, and physical activity. During the HIA, the steering committee helped the core team select and narrow down possible research questions and refine the project's scope, and provided guidance on the analysis of health impacts and the development of the draft findings, recommendations, and report (Figure 2).

Data sources and methods of analysis. The core team reviewed the content of the 2003 edition of the *Guide*, guides from other states and non-profits, and related HIA reports and recommendations. Reviews of the literature and secondary data sources were used to understand the relationship between health and academic achievement and to predict health impacts likely to occur as a result of changes made to the *Guide*. A variety of primary data collection strategies were used to address data gaps: online surveys of school professionals (superintendents; principals; nutrition services staff); key informant interviews with administrative and content experts; and case studies of schools that recently completed new construction or renovation projects.

Project support. This project was supported by a grant from The Health Impact Project, a collaboration between The Pew Charitable

Trusts and the Robert Wood Johnson Foundation, with additional funds provided by the Blue Cross and Blue Shield of Minnesota Foundation. The Health Impact Project and Human Impact Partners provided technical assistance.

A NOTE ON THE INTERPLAY BETWEEN DESIGN AND PROGRAMMING

While this HIA focuses on identifying construction and design features that encourage student health and wellness, a number of factors including, but not limited to, the use of evidence-based programmatic practices and the level of support among school administrators, teachers, and staff, ultimately influence how construction and design decisions impact student health behaviors and related health outcomes. A school’s location and design establish a foundation that can either enhance or constrain programmatic efforts to improve student health and wellness (Figure 3).



FIGURE 3: Examples of alignment between school construction, design, & programming elements

Construction	Design	Programming
School location (site)	Location and condition of sidewalks, walking/biking paths	<u>SRTS</u> ; Walking School Bus
Kitchen size (square feet)	Location and design of food prep areas; size and location of refrigeration/freezers	Farm-to-School
Classroom size (square feet)	Reconfigurable furniture; flooring/insulation that reduces noise	Active Classroom
School grounds (square feet)	Presence and location of green space, bike racks, playground equipment, hard-surface play areas	Active Recess, School/Community Gardens

For example, all schools can take at least some steps to make fresh fruits and vegetables more readily accessible to students. However, schools with kitchens that have adequate storage space and space to prepare meals from scratch with fresh ingredients, coupled with classroom curricula that help students learn how to grow healthy food, a school garden, policies that eliminate or limit the amount of junk food available to students, staff training, and a supportive administration, are arguably more likely to be successful in changing student behavior. Similarly, there are a number of ways that teachers can incorporate movement and physical activity into their classroom instruction. Yet, it might be easier for teachers to employ these practices when they are able to help design their classroom space and teach in adequately sized classrooms with furniture that can be easily moved.

To a large extent, research examining the direct relationships between school construction and design features and changes in student health, academic achievement, and other key outcomes is still quite limited. However, as described later in this report, there is a growing research base describing the relationship between school policies and practices — factors that are enhanced or encumbered by school design features — and key health outcomes. This HIA focuses on describing design elements that could optimize effective programs and policies and thereby increase student, staff, and community opportunities for healthy behavior (Figure 4).

FIGURE 4: Components of a School Culture of Health



Scoping



During the scoping step of the HIA, the core team conducted preliminary research, gathering and synthesizing input from the project’s steering committee and technical advisors to help identify relevant health determinants, research questions, health indicators, possible data sources, and research methods to be used during the assessment phase. The scoping process included an examination of affected populations and an extensive exploration of pathways through which the selection of school sites and the design of school spaces can affect student and community health. Agreement was reached on the goals of the HIA and an assessment workplan.

Populations Affected

The *Guide* is intended to assist Minnesota school administrators, architects, planners, and other stakeholders who are involved in planning new construction or major renovations of schools. Recommendations from the HIA that are incorporated into the next revision of the *Guide* have the potential to influence decisions made by MDE, as the state agency with oversight responsibility for the K–12 [school siting](#) and construction decision-making process, and by any of the 332 school districts or 143 charter schools that operate more than 2,000 school facilities across the state. A relatively small number of major renovation and new construction projects are commenced each year, though, about 40, according to MDE estimates ([Appendix IV](#)).

Minnesota's public school system currently serves about 851,000 students in grades K–12 (MDE Report Card, 2014). These students, their families, teachers, administrators, and support staff are the populations most likely to be affected by this HIA and the next revision of the *Guide*.

Within these very large populations, a number of subpopulations may feel the effects of school planning decisions more so than others. These subpopulations include communities of color, lower-income households, the disabled, individuals with pre-existing health conditions, residents of rural communities, older or aging adults, or any other priority population or identified group that may be less able to participate in decisions that impact their lives, less likely to have the resources necessary to avoid unhealthy elements affecting their environments, or otherwise particularly vulnerable to changes resulting from a proposed policy, plan or project.

Community users of varying ages and backgrounds are also likely to be affected. In addition to their role as places of learning for children, school facilities function as important community centers, offering indoor and outdoor venues for many highly valued activities that contribute to community learning, health, and cohesion. Examples include athletic activities and general recreational use; community education classes; theater and dance classes and productions; concerts; community health or dental clinics; pre-school and child care programs; cooking classes; community fundraisers; home improvement fairs; book fairs; and civic purposes (e.g., polling places; emergency shelters; and summer meals programs for lower-income students and adults). Schools can partner with government agencies or private, non-profit organizations through a co-location agreement or, more simply, can enter into shared use agreements with community organizations to allow community groups to use the school facilities or grounds in the evenings, on weekends, or at other times when school is not in session.

In addition to providing guidance for Minnesota audiences, the HIA report and recommendations and the *Guide* itself, once revised, have potential to serve as resources for individuals, organizations, and agencies in other states that are interested in improving health outcomes in public and private K–12 school settings.

Stakeholder Involvement in the HIA

Active stakeholder participation is a critical component of HIA process. *“Ensuring stakeholder involvement and leadership helps promote a vision of an inclusive, healthy, and equitable community, in which all people, regardless of income, race, gender, or ability, can participate and prosper”* (Stakeholder Participation Working Group of the 2010 HIA of the Americas Workshop, 2012).

From early on, the steering committee played a central role in determining the scope of this HIA. Participants in an HIA training hosted by the Public Health Law Center in January 2014, including individuals who were invited to join the project's steering committee and other interested stakeholders, assisted in creating *pathway diagrams* (i.e., causal diagrams or logic pathways) and identifying health determinants. Participants also identified voices that were missing from the table, such as a school district food services director and a facilities expert, and suggested additional stakeholders for inclusion. Later, as the scoping process got underway, steering committee feedback regarding the pathway diagrams and scoping worksheets helped the core team refine and prioritize research questions to shape the assessment phase.

Identifying and Prioritizing Determinants of Health

In creating the pathway diagrams, the core team and steering committee were able to see linkages between possible changes that could be made to the *Guide* and the probable impact of those changes on students' health. Over the course of two meetings, scoping exercises were conducted by the core team, seeking input from the steering committee to narrow down the range of possible health issues that could be assessed during the HIA, given time and resource constraints. Four broadly stated categories of health determinants were selected: **physical activity**; **food environment**; **inclusive decision-making**; and **location efficiency**, which was defined to include transportation access, shared use of facilities and grounds, and intergovernmental collaboration.

Defining the Project's Scope and Prioritizing Research Questions

After selecting these four categories of health determinants for the assessment, the core team and steering committee made further refinements to the project's scope by selecting key research questions for use in the assessment. The core team developed possible research questions for each of the selected categories and presented them to the steering committee for discussion. For each category of health determinants, the potential research questions addressed certain considerations: **existing conditions**; **possible health impacts (outcomes)**; **indicators of health**; **data sources**; and **methods of data collection**. Ultimately, the core team and steering committee decided to conduct assessments of *measurable* health determinants only; as a result, one of the four broad categories of determinants selected earlier, inclusive decision-making, was not included in the assessment workplan, and one of the three sub-strands of location efficiency — intergovernmental collaboration — was also set aside. Participants decided that these health determinants, while critically important, would best be addressed as cross-cutting topics in conjunction with the examination of the determinants that were included in the workplan.

Because of time and resource limitations, not all possible health impacts identified during the scoping phase could be fully evaluated during the assessment phase. For this reason, the core team and steering committee decided to prioritize possible health determinants based on their potential impact, the likelihood of inclusion in the *Guide*, and the feasibility of school districts implementing the proposed changes. For example, some participants were initially interested in considering whether the proximity of schools to fast food outlets may have an impact on the availability and consumption of healthy foods. However, after one steering committee member noted that schools typically have very limited siting options to choose from, we concluded it was more important to focus on the proximity and connectivity of schools to residential areas.

The core team and steering committee also considered whether any of the topics discussed were already being addressed in resources other than the *Guide* or were likely to be considered in the next revision of the *Guide*, whether or not they were included in the HIA. For example, although steering committee members viewed air quality as an important health determinant, they ranked this topic as a lower priority for this HIA because a number of resources and recommendations on this topic are readily available and in use by school construction planners and decision-makers ([Appendix II](#)).

With discussion of these limitations aired, the core team prepared scoping worksheets and distributed them to steering committee members, asking each of them to review and prioritize the research questions for each category of health determinants using the following criteria:

- Prioritize the research questions (from highest to lowest)
- Identify any questions or topics that may not be properly addressed
- Identify additional or alternative indicators, data sources, or methods (alternatively, prioritize examples already listed)
- Point out any other thoughts or ideas regarding the project and process

The following research questions received the highest priority rankings:

FOOD ENVIRONMENT

- How would revisions to the *Guide* affect and/or increase the number of schools that design or redesign indoor food environments to promote consumption of healthy foods?
- How would revisions to the *Guide* affect and/or increase the number of school districts that consider healthy eating policies and practices in school construction decision-making processes?

LOCATION EFFICIENCY

- How would revisions to the *Guide* impact the types, quantities, and qualities of physical infrastructure at schools, or how schools are incorporated into the existing infrastructure or built environment?
- Would changes to the *Guide* affect the proximity of schools to homes?

PHYSICAL ACTIVITY

- How would revisions to the *Guide* affect and/or increase the number of outdoor spaces designed to support or encourage physical activity?
- How would revisions to the *Guide* affect and/or increase the number of school spaces designed to support or encourage physical activity?

Based on the responses received, the core team developed an assessment work plan to address the prioritized research questions and vetted it with the steering committee. The work plan included a more detailed set of research questions (existing conditions and potential health impacts), descriptions of data collection methods, and planned reviews and analyses to guide the assessment phase. Steering committee members were given the opportunity to advocate for inclusion of any topics that did not receive top rankings.

Assessment



The assessment step of the HIA focuses on the analysis of potential health impacts of proposed changes to the *Guide*. The analysis begins with a description of the methods used to gather information for this HIA, followed by a summary of key findings from the literature review and then a description the current health conditions of the affected communities. The potential health impacts are then analyzed using the measurable categories of health determinants identified in the scoping step (food environment, physical activity, location efficiency). The analysis draws from multiple data sources including the literature review, surveys, key informant interviews, focus groups, and feedback from the HIA steering committee and other experts, to consider who might be affected by the proposed changes, and how. The assessment findings are then used to inform the development of the HIA recommendations.

Methods

A variety of data collection approaches were used to gather data for the scoping and assessment phases of the HIA and to inform the development of recommendations. These methods are described below.

LITERATURE REVIEW

A literature review of peer-reviewed journal articles and other published documents summarizing the current evidence base was conducted to examine the relationships between health and academic outcomes, as well as the evidence for health impacts that would result from changes to the *Guide* in the topic areas prioritized through the HIA. Where available, the review focused on strong meta-analyses and other summary documents published in the past five years (2008 or later). However, individual studies and older articles were also included in the search if recent meta-analyses were not

available. Targeted literature reviews were conducted, as necessary, to identify additional studies not included in these comprehensive reviews, as well as to explore additional topics in greater detail.

REVIEW OF SECONDARY DATA

Multiple data sources were reviewed to understand the current health status of Minnesota students, the use of health-promoting policies and practices by schools in the state, and perceived barriers to students walking and biking to school. These data sources, which include Minnesota Student Survey data and analyses of parent survey results gathered by Minnesota Safe Routes to School grantees, are referenced throughout the assessment section of the report.

FOOD SERVICE DIRECTORS SURVEY

An online survey was developed to assess current capacity for preparing meals from scratch, barriers to doing more preparation of meals from scratch, and participation in current food-related programs and initiatives. The survey was administered by MDE in May 2014, via an existing list serve that included food service directors, managers, administrators, and school cooks from the 339 school districts across the state. The survey was open for three weeks and completed by 200 individuals. Assuming that only one person from each district completed the survey, 59 percent of school districts across the state were represented in the results. While we estimate that over half of the districts in the state were represented in the survey, the survey results may not fully reflect experiences in all districts. Respondents from districts that have been working more deliberately on changes to their food environment may have been more motivated to complete the survey.

PRINCIPAL SURVEY

An online survey was developed to estimate the number of new construction and major renovation projects likely to occur, to assess current health promoting practices that are being used in schools, and to identify barriers to supporting student healthy eating and physical activity. The online survey was administered by MDE in May 2014 to an existing listserv of school principals. The survey was also administered in June 2014 by two statewide professional associations representing secondary and elementary principals. The Minnesota Elementary School Principals Association listserv reached approximately 820 licensed principals and assistant principals across the state, and the Minnesota Association of Secondary School Principals was sent to 615 principals. A total of 99 principals completed the survey, representing four percent of public schools in the state. The low number of responses may be the result of the survey being administered at the end of the school year. It is important to note that the survey results may not fully reflect the experience in all schools. Information from the survey was used to increase understanding of barriers to supporting student health and wellness, but could not be used to estimate how often health-promoting practices are currently being used in schools.

SUPERINTENDENT SURVEY

An online survey was also developed to better understand how school districts approach the planning and design process and the degree to which health is considered. The online survey was administered by MDE in May 2014 to an existing listserv of school district superintendents. The survey was

also administered online in June 2014 to 346 school superintendents who are members of the Minnesota Association of School Administrators. A total of 33 superintendents completed the survey, representing 10 percent of school districts in the state. The low number of responses may be due to the survey being administered at the end of the school year. Again, it is important to note that the survey results may not fully reflect the experience of all school districts.

KEY INFORMANT INTERVIEWS

Semi-structured key informant interviews were conducted with school representatives from eight schools that had incorporated unique design elements into a recent school renovation or construction project. These schools were identified using a list of recent new school construction and major renovation projects provided by MDE. The individuals interviewed included school principals, district superintendents, food nutrition services directors, involved parents, transportation coordinators, SRTS planners, city/regional planners, and other community stakeholders. Information from these interviews was used to illustrate planning and design highlights and challenges, to highlight promising approaches that support student health and well-being, and/or to gather and report local data that estimate health impacts.

Additional key informant interviews were conducted with representatives associated with two schools that were identified by steering committee members as having knowledge and experience with specific planning or design features. Interviews were conducted with the director of a community recreation program that is co-located with a public school as well as the principal of that school, and with the principal of a newly constructed STEAM (science, technology, engineering, arts, and math) school. These interviews were conducted by phone or email using the key informant protocol used for the case studies.

SCHOOL CASE STUDIES

Case studies were conducted with two of the eight schools that initially participated in key informant interviews to gather additional information about school design and planning processes and to further assess how specific design features have impacted student health and wellness. The case study protocol included an observational assessment of the school grounds and building, semi-structured key informant interviews with a variety of school and community stakeholders who were involved in the planning process and/or in positions to discuss the impact of specific design elements, and a review of local school data, including Minnesota Student Survey results and student absentee records that have been used to assess the impact of specific health-promoting changes in the case study school.

PARENT FOCUS GROUPS

After the completion of the case studies and the assessment step, core team staff returned to the two case study schools to conduct focus groups with parents whose children had been affected by the school construction projects before, during, and after the projects were completed. The purpose of the focus groups was to gain a better understanding of parent and community engagement in the planning and design process and to identify potential recommendations to strengthen parental engagement. The focus group for *Case Study School A* was conducted in-person at the school with four parents who had participated on a steering committee for the design of the school. The focus group for *Case Study*

School B was conducted by video-conference, due to inclement weather, and included eight parents who also served as teachers or administrators at the school. Participants were identified and invited by school administrators and were informed that their participation was voluntary prior to and at the start of the discussions. Discussion themes from the focus groups were used to create short narratives.

Health and Academic Achievement: A Focused Review of the Literature

RELATIONSHIP BETWEEN STUDENT HEALTH BEHAVIOR AND LONG-TERM HEALTH OUTCOMES

Schools can play an important role in supporting student health. For example, a healthy school food environment where nutritious meals are served and opportunities to consume junk food are limited can promote healthy eating behaviors at an early age. Similarly, a school with adequate spaces for movement and activity within the building and on the school grounds provides students with opportunities to be active. In addition, peer social norms around eating and physical activity can influence behavior and related health outcomes in the short-term. Finally, a strong health education and physical education curricula can teach students about nutrition and provide students with opportunities to develop physical activity skills and interests that can carry into adulthood.

There is considerable evidence demonstrating that childhood health behaviors that contribute to overweight and obesity can influence adult health outcomes. Multiple studies have found that children and adolescents who are obese are more likely to be obese as adults and to be at higher risk for related health problems, including heart disease, several types of cancer, and diabetes (Baker et al., 2007; Centers for Disease Control and Prevention, 2014; Deshmukh-Taskar, et al., 2006; Tirosh, et al., 2011). Conversely, healthy childhood behaviors can be a positive predictor of adult health — longitudinal and retrospective studies cited in recent reviews have demonstrated a positive association between childhood physical activity and physical activity in adulthood (Hallal, et al., 2006; Telama, et al., 2014, & Telama, 2009). There is also evidence that consumption of fruits and vegetables in childhood is associated with eating habits in adulthood (Maynard et al., 2006).

RELATIONSHIP BETWEEN STUDENT HEALTH AND ACADEMIC ACHIEVEMENT

The primary responsibility of schools is to help students learn to the best of their abilities. Studies have demonstrated that students who exhibit healthy behaviors across multiple measures, such as having a healthy body mass index (BMI), consuming the recommended servings of fruits and vegetables, and getting adequate sleep, are more likely to be on goal academically for their age group, as measured by standardized tests (Ickovics, et al., 2014).

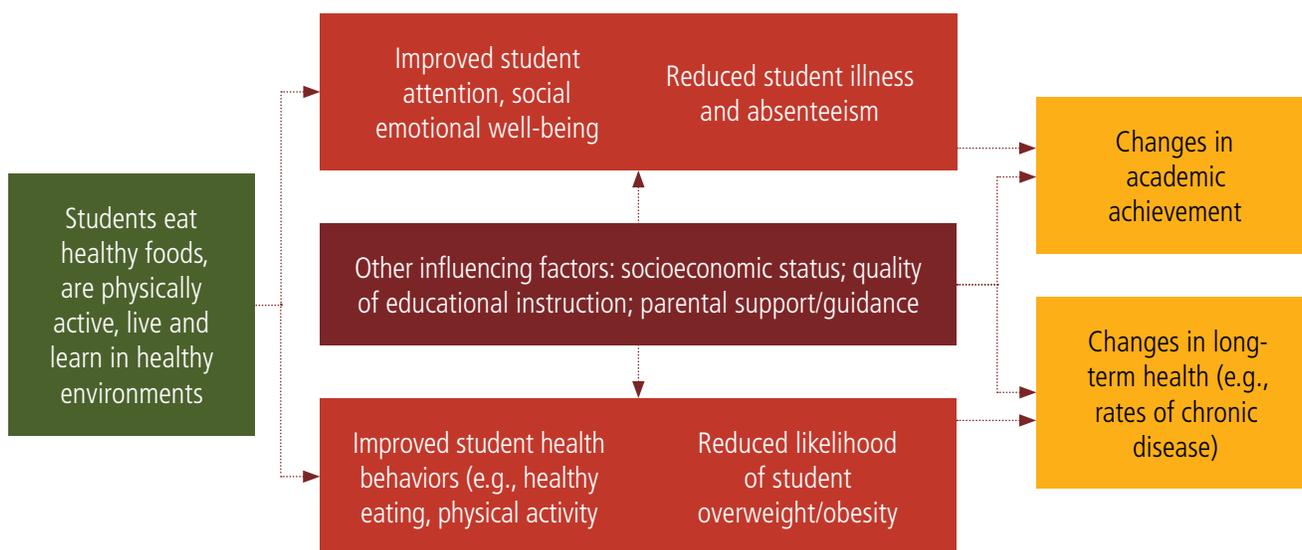
The impact of health on academic achievement can work through multiple complex mechanisms. A recent review of the literature cites multiple studies demonstrating a positive relationship between consumption of healthy foods and multiple measures of academic achievement and school performance, including improved academic grades and standardized test scores, improved cognitive performance (e.g., memory, alertness, attention), and reduced absenteeism (Centers for Disease Control and Prevention (CDC), 2014a). A number of studies and review articles have also reported a positive relationship between physical activity and multiple measures of academic performance including improved grades and performance on standardized tests, improved cognitive performance

(e.g., concentration, memory, on-task behavior), better classroom behavior, and lower school drop-out rates (CDC, 2014a; Lees & Hopkins, 2013; Lubans, 2012; Raspberry, 2011; Singh, et al., 2012). The degree of improvement in these studies is often small, and more research is needed to understand how to implement interventions in ways that optimize youth learning and academic performance. That said, it is important to note that this body of research shows academic performance does not decrease when interventions to increase time for physical activity reduce traditional classroom learning time.

Obesity, often resulting, in part, from poor eating and physical activity behaviors over time, is also associated with poor academic outcomes. One study found adolescent students who are overweight or obese report missing 36 percent more sick days than their normal weight peers (Pan, Sherry, Park, & Blanck, 2013). This research prompted additional study to explore whether healthy food changes in the school lunch program could minimize sick days. The study found that in schools using fresh ingredients, student attendance rates improved, with one school reporting a 14 percent reduction in absences compared to schools that did not implement any changes to their school meal program (Belot & James, 2011). Long-term, improved academic performance and educational achievement (i.e., graduating high school) are also associated with stronger networks of social support as well as lower rates of obesity, chronic disease, and premature mortality in adulthood (Cutler & Lleras-Mundy, 2006; Egerter, et al., 2009).

Many factors influence how well students perform in school and these factors are often interrelated (Figure 5). For example, a student who is having difficulty staying focused and attentive in class may be more likely to skip classes, further contributing to poor academic outcomes (Basch, 2010). In addition, factors that contribute to academic performance and individual health and wellness include socioeconomic status, quality of instruction, and parental involvement. Although it can be difficult to measure the potential impact of a school-based intervention in the context of factors such as these that influence health, the literature summarized in this report shows a number of ways that the school environment can be modified to better support student health and academic achievement.

FIGURE 5: Factors that influence academic achievement, long-term health outcomes



CONSIDERATIONS TO ADVANCE EQUITY

In Minnesota, residents of color are more likely to experience disproportionate health burdens such as lower life expectancy, higher rates of cancer, diabetes, heart disease, and stroke (Minnesota Department of Health, 2014). Health inequities such as these begin to surface early; students of color and students from lower-income households have lower levels of self-reported health and are less likely to meet the recommendations for healthy eating and physical activity standards (Minnesota Student Survey, 2013). School location, construction and design of spaces, programming, and policy decisions can reduce or exacerbate these observed differences in behavior.

Two recent review articles provide evidence of the interrelationship of health behavior and academic achievement and call for more coordinated efforts in order to reduce academic and health inequities (Basch, 2010; Bradley & Greene, 2013). Together, these reviews explore the impact of multiple health risk behaviors and other indicators of poor health on academic performance, including insufficient physical activity and inadequate nutrition, yet extend to other behaviors such as vision problems, teen pregnancy, violence, alcohol, and drug use. These reviews emphasize that efforts to improve the school food environment and increase opportunities for healthy eating will have the greatest opportunity for impact among lower-income students who are experiencing hunger, food instability, and poor nutrition as a result of missing meals or having limited access to high-quality food.

District- and state-level decisions that influence the location and feasibility of new school construction and major renovation projects also have the potential to reduce or widen existing health and academic disparities. Schools in greatest need of renovation may be unable to gather the support and funding necessary to undertake construction and renovation projects (Uline et al., 2010) — even though the students who attend these schools may be more likely to experience disproportionate health burdens and could benefit the most from a thoughtful design process that creates opportunities for, and supports, student health and well-being. A study of 82 schools found community engagement, a factor associated with improved student achievement, was more likely to occur in schools with better building facilities (Uline & Tschannen-Moran, 2008). The overall condition of schools also plays a role in where teachers prefer to work (Fuller et al., 2009). Therefore, schools in poorer school districts with the greatest needs for additional support may have the greatest difficulty involving community residents and attracting and retaining highly-qualified teachers.

In order for school siting and construction projects to meet the needs of a community, the community's residents need to be involved in the planning process. Members of the HIA steering committee noted, however, that planning processes may not always allow enough time to gather feedback from residents or offer sufficient flexibility to allow residents to attend and participate meaningfully in planning meetings.

Current Conditions

LOCAL DATA DESCRIBING STUDENT HEALTH AND ACADEMIC ACHIEVEMENT

There is a strong association between positive health behaviors and academic success in Minnesota. MDH and MDE have developed a student health index to examine the relationship between six key health-promoting behaviors and measures of student academic success that are included in the 2013 Minnesota Student Survey (see Figure 6 and the accompanying note, which lists the six health behaviors included in the health index).¹ The health rating describes the total number of identified health behaviors students report out of a total of six.

Across multiple measures of academic achievement, there is a consistent relationship between academic success and students' health index score. On average, the more positive health behaviors exhibited by a student, the stronger their academic success (Figure 6). Three-quarters of students with a health index score of six received mostly As, compared to less than one-quarter of students (23%) who did not report any

Summary of Key Findings

There is a strong association in Minnesota between positive health behaviors such as physical activity, fruit and vegetable consumption and measures of student academic performance such as high grades and few disciplinary actions.

Across a number of indicators of health and academic achievement including obesity and diabetes, students of color and students from lower-income households tend to have poorer outcomes.



¹ In 2013, all public schools were invited to participate in the Minnesota Student Survey, and a total of 280 agreed to do so (84% of all public school districts). It should be noted that some of the state's largest districts chose not to participate, at least one of which conducted its own survey. Overall, approximately 69 percent of 9th grade students statewide completed the survey.

FIGURE 6: Percentage of 9th grade students who demonstrate measures of academic achievement, by health index score (see note)

Health index score	Received mostly As	Are “educationally engaged” (see note)	Have a “strong relationship” with teachers (see note)	Were sent to the school office less than once a month
0	22.5%	64.5%	49.3%	86.1%
1	29.9%	68.0%	51.9%	88.0%
2	37.8%	73.5%	57.0%	91.1%
3	45.7%	78.9%	60.8%	92.0%
4	54.9%	83.3%	64.7%	93.4%
5	65.1%	87.2%	70.7%	95.6%
6	74.6%	90.6%	73.9%	97.6%

Note: The following health behaviors are part of the health index: a) BMI less than the 85th percentile; b) at least 60 minutes of physical activity per day for at least 5 of the last 7 days; c) consumed at least one serving of fruit per day during the past week; d) consumed at least one serving of vegetable per day in the last week; e) did not consume sugar drinks on the previous day; and f) did not consume fast food in the past week.

The “educationally engaged” variable is a scale score based on the following items: a) How often do you care about doing well in school? b) How often do you pay attention in class? c) How often do you go to class unprepared? d) If something interests me, I try to learn about it; e) I think things I learn in school are useful; and f) being a student is one of the most important parts of who I am.

The “Teacher-Student Relationship Scale” score, indicating a strong student-teacher relationship, is based on the following items: a) Overall, adults at my school treat students fairly; b) Adults at my school listen to the students; c) The school rules are fair; d) At my school, teachers care about students; e) Most teachers at my school as interested in me as a person.

Source: Minnesota Student Survey, 2013; analysis provided by MDH and MDE

health-promoting behaviors. Similarly, just over 90 percent of students with a health index score of six were “educationally engaged,” compared to 65 percent of students who did not report any health-promoting behaviors.

DISPARITIES IN STUDENT HEALTH AND HEALTH BEHAVIOR

Not all Minnesota students experience good health. Student health is an important outcome in and of itself, as well as a factor that contributes to academic success — yet, only 68 percent of 9th grade students describe their health as “very good” or “excellent” (Figure 7). In addition, nearly one-quarter of students (23%) reported having a BMI indicating they are overweight or

FIGURE 7: Key student health indicators

Students who describe their health as “very good” or “excellent”	68%
Students who are overweight	14%
Students who are obese	9%
Students who have diabetes	1%
Have asthma	17%
Students who have gone to the nurse’s office three or more times in the past month	6%

Source: Minnesota Student Survey, 2013; analysis provided by MDH and MDE.

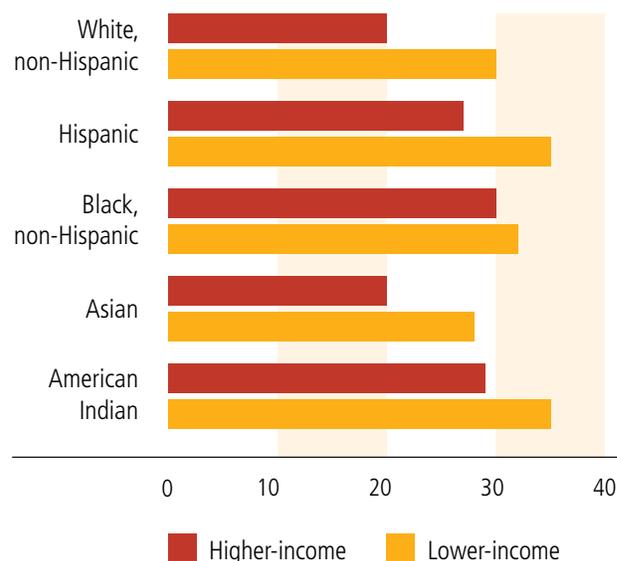
obese, a rate that has been quite stable since 2007. Although a fairly small percentage of students self-report having diabetes (1%), the only chronic condition assessed in the survey, six percent of students report having gone to the nurse’s office three or more times in the past month.

Students of color, LGBTQ (lesbian, gay, bisexual, transgender, questioning) students, and students from lower-income households tend to have disproportionately high rates of overweight and obesity. Over 30 percent of Black (31%), Hispanic (31%), and American Indian (32%) 9th grade students are overweight or obese, compared to less than one-quarter of Asian (23%) and White (22%) students. Students who identify their sexual orientation as bisexual, gay or lesbian, or not sure/questioning are also more likely to be overweight/obese than their heterosexual peers (30-36%, compared to 22% of heterosexual students).

Minnesota Student Survey data confirms an association between obesity and socioeconomic status. Over one-third of Minnesota students (39%) qualify for free or reduced-price lunch under the **National School Lunch Program (NSLP)**, a benefit available to students from lower-income households who meet financial eligibility requirements. These students more likely to be overweight or obese than those who do not qualify for support (30% compared to 20%, respectively). Health disparities also persist across racial/ethnic groups (Figure 8). Students who are food insecure, meaning that they sometimes have to skip meals because their family does not have enough money to buy food, are also more likely to be overweight or obese (31%, compared to 22% of students who do not experience **food insecurity**).

Overall, students of color, students from lower-income households, and LGBTQ students are more likely to experience poor health and related poorer academic outcomes. Among 9th grade students who responded to the Minnesota Student Survey, 28 percent have “high” health index scores of 4 or more, indicating good health and positive health behaviors. High scores are less common among students who receive free or reduced-price lunch (19%) and students who experience food instability (18%) or homelessness (21%). In addition, White and Asian students are significantly more likely to have high health scores than students who are American Indian (21%), Black, African, or African-American (18%). LGBTQ students are also less likely to have “high” health ratings than heterosexual students (17-24%, compared to 29% of heterosexual students) (Figure 9).

FIGURE 8: Percentage of students who are overweight/obese by race/ethnicity & income status



Note: “Lower-income students” refers to students who qualify for free or reduced-price lunch.

Source: Minnesota Student Survey (2013): Grade 9; analysis provided by MDH and MDE.

FIGURE 9: Percentage of 9th grade students with “high” health index scores, indicating good overall health and the use of positive health behaviors

Student group	
All students	28%
RACE	
American Indian	21%
Asian	27%
Black, African, African American	18%
White	29%
ETHNIC-CULTURAL GROUPS	
Hispanic	19%
Hmong	18%
Somali	16%
SEXUAL ORIENTATION	
Heterosexual	29%
Bisexual	17%
Gay or lesbian	21%
Questioning (not sure)	24%
ECONOMIC HARDSHIP	
Receives free or reduced-price lunch	19%
Household food instability (had to skip meals because family did not have enough money for food)	18%
Homeless in the past 12 months	21%
GEOGRAPHY	
Twin Cities Metro area (7-county)	29%
Greater MN: More than 5,000 students	28%
Greater MN: More than 2,000–4,999 students	28%
Greater MN: More than 1,000–1,999	26%
Less than 1,000 students	26%

Note: “High” health index scores are ratings of 4 or higher across the six key items: a) BMI less than the 85th percentile; b) at least 60 minutes of physical activity per day for at least 5 of the last 7 days; c) consumed at least one serving of fruit per day during the past week; d) consumed at least one serving of vegetable per day in the last week; e) did not consume sugar drinks on the previous day; and f) did not consume fast food in the past week.

Source: Minnesota Student Survey, 2013; analysis provided by MDH and MDE



Health behavior also varies based on gender, race/ethnicity, socioeconomic status, and geography. The United States Department of Health and Human Services (DHHS) Physical Activity Guidelines recommend that youth should be physically active for at least 60 minutes every day of the week (DHHS, 2008). However, the Minnesota 2013 Student Survey data demonstrates that relatively few 9th grade students in this state meet that guideline (26% of boys and 13% of girls). At a lower threshold of five or more days of at least 60 minutes of physical activity, disparities by race/ethnicity, sexual orientation, and socioeconomic status are evident. For example, 41 percent of students who receive free or reduced-price lunch meet this this physical activity indicator, notably less than students overall (51%). Student consumption of fruits and vegetables also varies by race/ethnicity, sexual orientation, socioeconomic status, and geography (Figure 10).

FIGURE 10: 9th grade student physical activity and eating behavior

Student group	Are physically active at least 60 minutes, 5 or more days/week	Consume at least one serving of vegetables each day	Consume at least one serving of fruits each day
All students	51%	40%	44%
RACE			
American Indian	48%	37%	40%
Asian	39%	40%	45%
Black, African, African American	45%	35%	43%
White	53%	41%	44%
ETHNIC-CULTURAL GROUPS			
Hispanic	41%	34%	41%
Hmong	36%	32%	37%
Somali	39%	33%	42%
SEXUAL ORIENTATION			
Heterosexual	52%	41%	44%
Bisexual	31%	36%	36%
Gay or lesbian	36%	35%	35%
Questioning (not sure)	37%	38%	39%
ECONOMIC HARDSHIP			
Receives free or reduced-price lunch	42%	34%	38%
GEOGRAPHY			
Twin Cities Metro area (7-county)	48%	42%	47%
Greater MN: More than 5,000 students	50%	41%	44%
Greater MN: More than 2,000–4,999 students	51%	41%	42%
Greater MN: More than 1,000–1,999	55%	37%	39%
Less than 1,000 students	58%	36%	36%

Source: Minnesota Student Survey, 2013; analysis provided by MDH and MDE

Current Health-promoting Practices among Minnesota K–12 Schools

PHYSICAL ACTIVITY

Across Minnesota, many schools are currently working to improve student health and wellness. In many instances, schools are participating in grant programs and initiatives funded by federal agencies, state government, and/or non-profit organizations that support schools' efforts to promote student health and wellness. Examples include SRTS, Farm to School, and Statewide Health Improvement Program (SHIP) strategies (Figure 11). Although counts of participating schools are available by funding source, there is no comprehensive summary of all of the policies and practices being implemented across the state. Some best practice programs and initiatives that focus on improving student health are not included in Figure 11, but are noted in [Appendix V](#), including those associated with the growing focus on building environmentally-friendly and sustainable [“green” schools](#).

A review of recent grant proposals shows that schools are very interested in programs that promote health, but that there is insufficient funding for these initiatives. In its [2013 report](#) to the state legislature, MnDOT reported having received 623 applications between 2006–2013 from communities with schools interested in participating in SRTS, totaling \$104,471,835 in SRTS projects, but was able to fund only 30 percent of these due to funding limitations. Similarly, the Minnesota Department of Agriculture (MDA) was able to award grants to only 28 of 56 applications for Farm to School grant funding for FY 2013–14 (MDA, 2014).

Across Minnesota, schools are implementing a variety of strategies that encourage physical activity during the school day. Data provided by MDH shows that schools partnering in local SHIP initiatives are implementing a variety of strategies that encourage physical activity, including quality physical education, active recess, active classrooms, and SRTS. These efforts are taking place in urban, suburban, and rural elementary and secondary schools across the state that vary in size and building age, demonstrating that schools can take steps to improve student health, even when lacking opportunities for optimal upgrades (Figure 12).

Summary of Key Findings

A number of schools are implementing programs and policies to encourage healthy eating and physical activity among students.

Schools use multiple strategies to increase physical activity among students, including quality physical education classes, athletics programming, SRTS, and active classroom practices.

Changes in vending machine and classroom snack policies are used more frequently by schools to create a healthy food environment than broader initiatives such as those that affect the types of food served at meals.

School construction and design can address some of the main barriers to supporting physical activity and healthy eating behavior among students.

By constructing facilities and designing interior and exterior spaces that create a healthy environment, schools can begin to address underlying factors that may contribute to health inequities among students.

FIGURE 11: School, school district participation in selected programs

	Number of schools (%)		Number of districts (%)	Number of students reached (%)	
Safe Routes to School (MnDOT) ^a	101	(4%)	N/A	N/A	
Safe Routes to School ^b	160	(6%)	N/A	68,075	(8%)
Active Classrooms ^b	232	(9%)	N/A	118,768	(14%)
Farm to School ^b	220	(8%)	N/A	105,140	(12%)
Farm to School ^c	1,351	(51%)	208	609,370	(71%)
School garden programs ^b	127	(5%)	N/A	57,575	(7%)
School garden programs ^c	89	(3%)	N/A	N/A	

Note: The counts listed are not unduplicated counts; a school may have received SRTS funding from both MnDOT and through SHIP. Estimates of the number of participating schools and students reached by farm to school programs vary widely as a result of how the information is asked and gathered. The USDA Farm to School Census asked respondents to report if the district or any school in the district participated in farm to school activities; if they reported “yes,” all students in the district were included in the estimate of students reached. The SHIP estimate is more conservative, including only schools that are actively involved in farm to school efforts through their initiative.

a Source: MnDOT, 2007–2013

b Source: MDH, [Statewide Health Improvement Program \(SHIP\)](#), 2012–13

c Source: [USDA Farm to School Census](#), 2011–12 school year

FIGURE 12: Description of schools currently participating in Statewide Health Improvement Program (SHIP) Active School Day sub-strategies

	Total number of schools working on strategy	Planning phase	Implementation phase
Quality physical education	130	9	121
Active recess	123	8	115
Active classrooms	129	15	114
Activities before/after school	75	3	72
Safe Routes to School	135	14	121
Other	52	1	51

Source: MDH, provided by Statewide Health Improvement Program (SHIP) evaluation staff.

FIGURE 13: Percentage of schools that have implemented policies and/or practices to encourage physical activity among students and staff (N=86)

	N	%
Quality physical education programming	58	67%
Before and/or after school programming	57	66%
Use of technology to learn in a variety of places within and outside the classroom	46	53%
Student/staff physical activity “challenges” or events	44	51%
Safe walking or biking activities/curricula/ infrastructure changes (e.g., Walk!Bike!Fun!)	41	48%
Active classroom programming	36	42%
Use of furniture that can be easily moved in classrooms/common spaces	21	24%
Active recess programming	19	22%
Changes to recess and/or physical education class schedules	16	19%

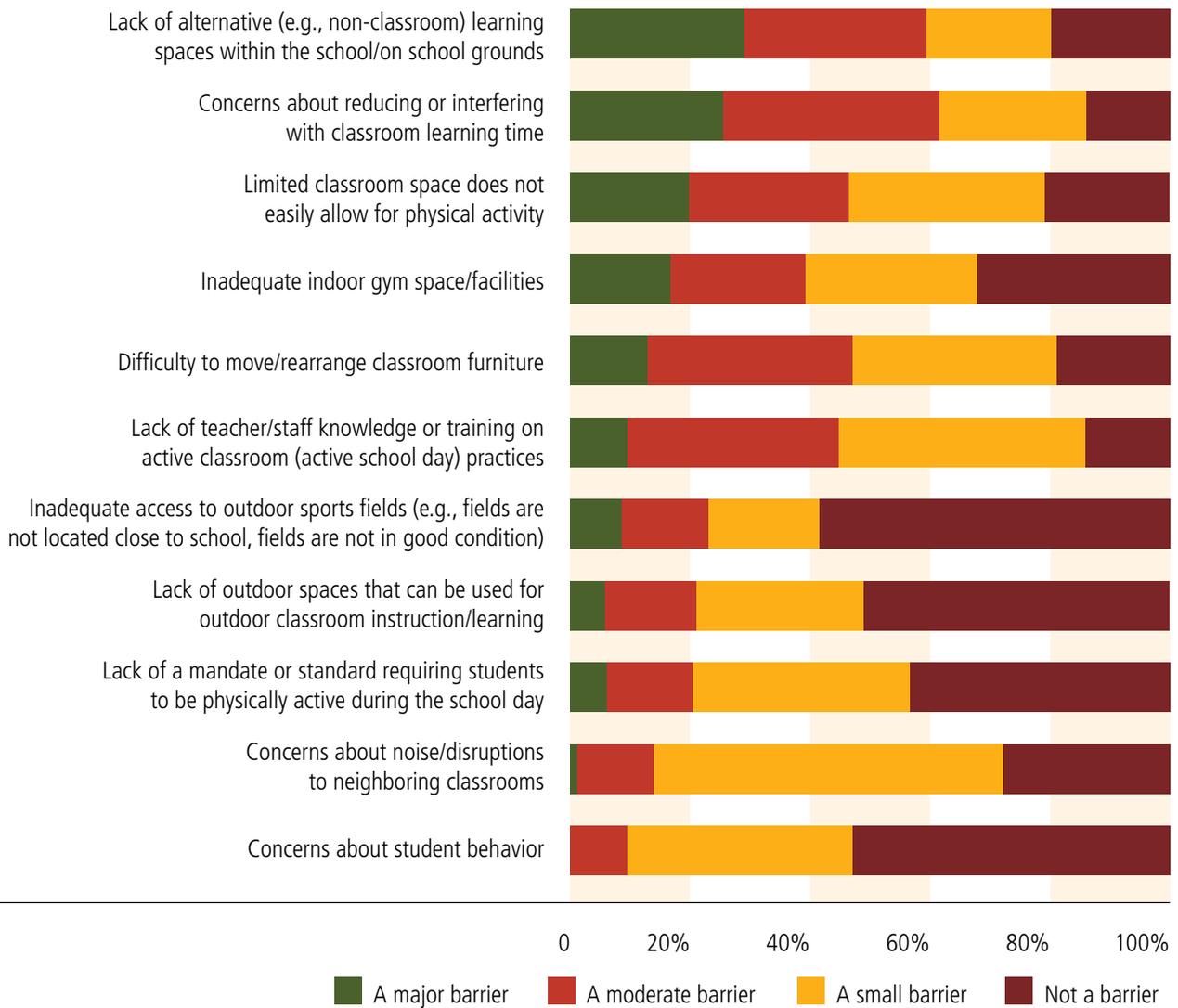
Source: School Principal Survey, 2014 (administered as part of this HIA project).

School principals also reported using a variety of strategies to encourage physical activity among students and staff. The results from the HIA survey administered to school principals provide insights into the type of strategies currently underway across the state. Principals who responded to the survey were more likely to encourage physical activity in their schools by incorporating quality programming during physical education classes (67%) or by offering programs before or after school (66%) than by undertaking efforts that encourage walking or biking to school such as SRTS (48%), active classroom programming (42%), or other various policies and practices (Figure 13).

Over half of principals identified concerns about reducing or interfering with classroom learning time as a “major” or “moderate” barrier to encouraging student physical activity. Among principals who responded to the survey administered as part of the HIA (Figure 14), concern about reducing or interfering with classroom learning time was the most commonly identified barrier to incorporating more options for physical activity into the school day (62% rated this item as a “major” or “moderate” barrier). A number of design and construction features were identified as important barriers, including: lack of alternative (e.g., non-classroom) learning spaces within the school building or on school grounds (59%); limited classroom space (47%); difficulty to move/rearrange classroom furniture (47%); and lack of teacher/staff knowledge or training on active classroom policies (45%).

For many schools, poor sidewalk connectivity and the speed of traffic on roads are barriers that may impact how many students walk or bike to school. The MnDOT SRTS program shared data from 94 baseline assessments completed by communities that received SRTS grants (MnDOT, 2014). In a number of these communities, the school’s walk/bike zone had infrastructure elements that were

FIGURE 14: Principals perceptions of barriers that make it difficult for staff and students to be more physically active during the school day (N=99)



Source: School Principal Survey, 2014 (administered as part of this HIA project).

viewed as barriers to walking and bicycling to school. Among the most common infrastructure challenges were streets or sidewalks with gaps or stops in walking or bicycling access (80% of communities), non-residential streets that without sidewalks on both sides (61%), and streets with posted speed limits of 40 miles per hour or more (45%).

At least half of parents identified distance, traffic concerns and safety at intersections as issues that impacted their decision about whether to allow their child to walk or bike to school. Parents whose children attend schools in SRTS grant communities identified a number of factors that influenced their decisions about whether to allow their children to walk or bike to school. Some of the most common factors that have influenced their decision include distance (75%), amount of traffic (57%), speed of traffic along the route (55%), and safety of intersections (50%) (Figure 15). However, over half of parents felt they would be likely to consider allowing their children to walk or bike to school

FIGURE 15: Issues that affected parents' decisions to allow their children to walk or bike to/from school in SRTS grant communities (N=14,130)

	Issues impacting parents' decision to allow students to walk/bike to school	Among parents who identified this as an issue; percentage who would be likely to allow their child to walk/bike to school if the issue was addressed
Distance	75%	41%
Amount of traffic along route	57%	46%
Speed of traffic along route	55%	46%
Safety of intersections/crossings	50%	53%
Sidewalks/pathways	36%	57%
Time	31%	39%
Violence or crime	28%	40%
Child's participation in afterschool programs	20%	38%
Adults to walk/bike with	18%	58%
Crossing guards	15%	58%
Convenience of driving	13%	34%

Source: MnDOT, SRTS Parent Survey data, 2007-2014. Analysis provided by the Center for Prevention at Blue Cross and Blue Shield of Minnesota.

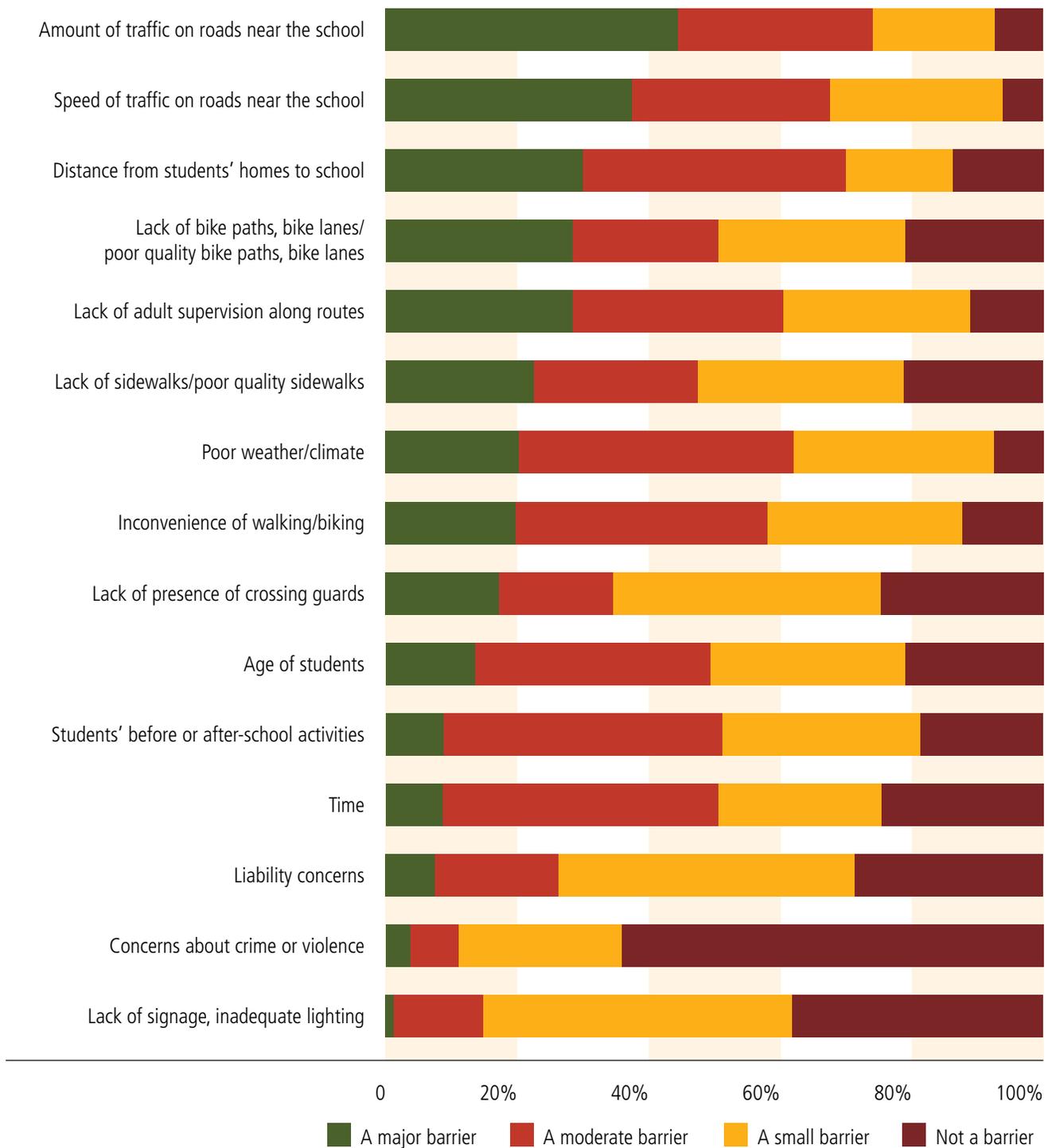
if the sidewalks/pathways (57%) or the safety at intersections/crossings (53%) were improved. Slightly fewer would consider allowing their children to walk/bike to school if the amount of traffic (46%) or the speed of traffic (46%) along the route to school was improved. These results suggest that infrastructure changes can make it more likely that students will walk or bike to school. The results also underline the need for collaborative efforts between schools, city planners, parents, and community stakeholders to address [active transportation](#) barriers.

Approximately three-quarters of principals (74%) identified the amount of traffic on roads near the school as a “major” or “moderate” barrier (Figure 16). Other frequently cited barriers included the speed of traffic on roads near the school (68%), the lack or poor quality of bike paths/bike lanes (51%), and the lack or poor quality of sidewalks (48%).

FOOD ENVIRONMENT

Changes in vending machine policies and classroom snack policies are used fairly commonly to limit student access to unhealthy foods during the school day. Results from the survey administered as part of this HIA to food service directors and other district and school nutrition staff indicated that a number of

FIGURE 16: Principals' perceptions of barriers that discourage students from walking and biking to school (N=99)



Source: School Principal Survey, 2014 (administered as part of this HIA project).

schools across the state have already made changes to improve the food environment, particularly through changes to vending machine contents and policies (69% and 61%) and to guidelines or policies concerning classroom rewards and celebrations (59%) (Figure 17). Farm to school initiatives are also commonly in place at sites served by those who responded to the survey. Similar results were obtained from the survey administered to school principals. Strategies that are being actively promoted through a variety of federal and statewide initiatives and local funders include changes to classroom policies and efforts to increase the availability of fresh produce at schools through farm to school programs and schools gardens.

A statewide survey of Minnesota school principals conducted in 2012 by the Centers for Disease Control and Prevention (CDC) also explored how many schools have implemented changes to provide a healthier food environment for students. A majority of principals reported that their schools had implemented policies to improve the food environment, including offering fresh produce near the cafeteria cashier (76%), a self-serve salad bar (68%), and locally grown foods in the cafeteria or classrooms (61%). Fewer schools had planted a school or vegetable garden (26%).

Barriers to schools' capacity to prepare meals from scratch were also explored through the HIA project's survey of nutrition services staff. The two most significant barriers to on-site preparation of meals/snacks from scratch reported were lack of staff time and concerns about cost, two areas that fall beyond the scope of the *Guide*. However, storage and space issues, which do fall within the existing parameters of the *Guide*, were also identified as barriers by a number of respondents. Nearly one in five nutrition services staff (19%) who responded to this question identified lack of space for food preparation as well as lack of refrigeration/storage space as major barriers to on-site preparation of food from scratch (Figure 18). These results are consistent with a national survey of Minnesota school food authorities, which identified kitchen space and equipment needs as primary concerns for implementing new school lunch program standards (The Pew Charitable Trusts & Robert Wood Johnson Foundation, 2014).

FIGURE 17: Changes in schools' food environment since 2010 (N=152)

	N	%
Change in the types of food and beverages sold in vending machines	105	69%
Changes in vending machine policies (e.g., hours of operation, location)	92	61%
Changes in recommendations/guidelines for classroom snacks and/or celebrations	90	59%
Participation in a farm-to-school program	83	55%
Use of events/classroom activities that offer students opportunities to taste different foods	68	45%
Change in food vendors/suppliers to improve food options	48	32%
Participation in a school garden program	45	28%

Source: Food Service Director Survey, 2014 (administered as part of this HIA project)

FIGURE 18: Perceived barriers to preparing on-site, from scratch meals in Minnesota schools

	A major barrier N (%)	A moderate barrier N (%)	A small barrier N (%)	Not a barrier N (%)
Lack of staff time (N=163)	34 (21%)	56 (34%)	42 (26%)	31 (19%)
Concerns about cost of preparing meals from scratch (N=164)	32 (20%)	52 (32%)	42 (26%)	38 (19%)
Lack of space for on-site food preparation (N=165)	32 (19%)	34 (21%)	36 (22%)	63 (28%)
Lack of refrigeration/storage space to store fresh foods (N=166)	32 (19%)	41 (25%)	37 (22%)	56 (34%)
Inadequate staffing (N=162)	26 (16%)	42 (26%)	50 (31%)	44 (27%)
Low interest among students in eating made-from-scratch meals (N=165)	17 (10%)	43 (26%)	42 (25%)	63 (38%)
Low support among staff for on-site, from scratch meal preparation (N=163)	17 (10%)	26 (16%)	40 (25%)	80 (49%)
Lack of training/experience among food nutrition staff to prepare meals from scratch (N=162)	14 (9%)	39 (24%)	43 (27%)	66 (41%)
Concerns about food safety and/or liability (N=159)	13 (8%)	24 (15%)	31 (20%)	91 (57%)
Low support among parents for on-site, from-scratch meal preparation (N=165)	6 (4%)	12 (7%)	43 (26%)	104 (63%)

Source: Food Service Director Survey, 2014 (administered as part of this project)

Note: Ten respondents wrote additional comments about barriers and/or their experience providing meals prepared on-site, from scratch. Other identified barriers included: nutrient disclosures; students not having had exposure to meals prepared from scratch at home; conforming to the [new federal child nutrition guidelines](#); the cost of providing Kosher foods; and production equipment costs.

Current School Facilities' Planning Processes

The composition of stakeholder groups that ultimately influence school siting, construction, and design decisions is important for advancing health equity. Without meaningful participation of a diverse group of staff, students, parents, community residents, and other stakeholders who represent the values and interests of the full community and student body, opportunities to reduce barriers to health and to foster academic achievement may be overlooked.

School design processes often focus on ways to create a rich learning environment, including adequate space for anticipated technology needs; the design's broader influence on student and community health may not be prioritized as heavily. Nearly all superintendents who responded to the project's survey felt it was "very important" for a final school design to create a rich learning environment for students (97%) and include adequate space for the use of new technology (91%). In contrast, fewer thought it was "very important" for the final design plan to optimize opportunities for students to be physically active during the school day (64%), be easily accessible for students/staff/residents who walk or bike to school (40%), or optimize opportunities for students and community members to access healthy foods (30%).

Local and regional planners and public health professionals who have experience and expertise in promoting health through design and programs are not consistently involved in school design and planning processes. Twenty-eight of the 33 superintendents who responded to the project's survey had recently completed a new construction or major renovation project and responded to questions about the design and planning process. Not surprisingly, school administrators and school board members were heavily involved in most design and planning processes. However, it was less likely for the planning process to include parents, teachers, students and other key stakeholders (e.g., food service staff, city/county/regional planners). Notably, only one in five projects included a representative from the community's local public health department in the planning and design process.

Summary of Key Findings

During a new construction or major renovation planning process, school administrators and other stakeholders focus on designing spaces that will provide rich learning environments for students, sometimes taking community use into account as well. Less emphasis has been placed on considering how the design of school spaces supports student and community health and the reduction of health disparities.

School design and planning processes do not regularly involve city, county, and regional planners, park board members, or local public health department staff. As a result, local stakeholders with valuable experience and expertise in considering ways to optimize student health may not have meaningful opportunities to influence the school's design or to explore potential community partnership opportunities, particularly in the early planning phases.

Community residents are not regularly involved in school districts' early discussions about school siting and design plans.



In Minnesota, SRTS teams provide strong examples of multi-disciplinary planning and implementation groups. Data provided by the MnDOT SRTS program showed that within communities that received a SRTS grant, each planning team had an average of seven members. Some of the most common stakeholders represented in each group included city/county planners (94%), principals (84%), parents (82%), law enforcement officers (78%), public health professionals (69%), and teachers (62%). Group size may be less important than ensuring a good mix of stakeholders are involved in the discussion; further analysis of the data showed that the number of SRTS team members did not predict the success of the group in passing key policies or developing comprehensive plans.

Anticipated Reach

DESCRIPTION OF STUDENTS LIKELY TO BE IMPACTED BY REVISIONS TO THE *GUIDE*

Minnesota’s public school system serves about 851,000 students. Statewide, nearly three-quarters of students are white (72%); fewer are Black non-Hispanic (11%), Hispanic (8%), Asian/Pacific Islander (7%), or American Indian (2%). Over one-third of Minnesota students (39%) qualify for free or reduced-price lunch offered through the NSLP (Figure 19).

The school environment can influence student health and well-being in a number of ways. The quality of meals served at the school and the nutrition instruction offered to students through curricula and other means can help encourage healthy eating behavior (Centers for Disease Control and Prevention, 2011; Perry, et al., 2004; Slusser et al., 2007). The school’s design and location, parent perceptions of traffic safety, as well as the school’s

FIGURE 19: Demographic characteristics of Minnesota K–12 public school students

All Minnesota students (N=850,763)	
RACE/ETHNICITY	
American Indian	2%
Asian/Pacific Islander	7%
Hispanic	8%
Black, non-Hispanic	11%
White, non-Hispanic	72%
PERCENTAGE OF STUDENTS WHO:	
Are English language learners	8%
Qualify for free/reduced-price lunch	39%
Receive special education services	15%

Source: MDE: [Minnesota Report Card](#) (2013-14 school year)

Summary of Key Findings

Nearly 851,000 students attend public schools in Minnesota. Given the amount of time students spend in school each year, schools are uniquely positioned to foster positive student health behaviors.

The overall age of Minnesota K–12 school buildings suggests a great need for improvements to and/or replacements of school facilities across the state. Sources of information rating or describing how the school environment and building design fosters or impedes healthy behavior are not readily available.

Each year, relatively few new school construction or major renovation projects take place. These types of projects are most likely to be directly influenced by a major revision of the *Guide*. It will be important for stakeholders to consider student health as they assess and prioritize their future facility needs.

There is a risk that a revision to the *Guide* may exacerbate health inequities and differences in academic achievement between school districts. Funding for new construction and major renovation projects may be easier to secure in more affluent communities with a larger tax base. Yet, schools with the greatest needs for improvements may be located in districts far less likely to receive voter approval for a new project.



commitment to encouraging student walking and biking to school, can influence the choices parents and students make about how to travel to and from school (Ewing, Schroer, & Greene, 2004; Schlossberg, et al., 2005; Weigand, 2008). Health-promoting programs and policies implemented by a school can establish and reinforce positive social norms that encourage healthy behavior (Centers for Disease Control and Prevention, 2011). While these design and programming decisions impact all students to some degree, they may be more likely to influence behavior among certain student groups. For example, serving nutritious meals can increase access to healthy foods for all students, but the quality of school meals may have a greater impact on the health of students who qualify for free or reduced-price lunch and who regularly eat one or more meals at school. As we describe potential health impacts in this report, we also identify student populations most likely to be impacted by each proposed revision to the *Guide*.

DESCRIPTION OF SCHOOLS LIKELY TO BE IMPACTED BY REVISIONS TO THE *GUIDE*

Many Minnesota K–12 school facilities are in need of building repairs, improvements, or replacements. The American Society of Civil Engineers (ASCE) estimates that schools in Minnesota have \$3.7

billion worth of infrastructure needs (ASCE, 2014). ASCE also notes that the absence of national data for more than a decade makes it difficult to estimate the scope of these needs, both at a state level and nationally (ASCE, 2014). Although MDE has access to information on the age and size of existing school buildings, there is no mechanism in place to rate the infrastructure quality of these buildings. Larger Minnesota school districts develop a 5- or 10-year facilities plan that identifies and prioritizes the need for building updates; however, these plans are not compiled at a statewide level. As a result, it is difficult to understand the infrastructure needs of schools across the state in a comprehensive way.

The types of projects that would be impacted most directly by the proposed changes to the *Guide* are new construction projects and major renovations that include changes to a school kitchen/cafeteria and/or facilities and outdoor areas for physical education and physical activity. For the purposes of this HIA, we estimated the number of new construction or major renovation projects based on a review of the types of projects that had occurred within the past five years, using information provided by MDE. Using that information, we estimated that approximately 15 schools will undergo a complete construction or comprehensive renovation project each year while an additional 25 schools will undergo projects that involve changes to the food service and/or physical activity areas. A description of the assumptions used to make this estimate is included in [Appendix IV](#).

Despite a growing need for improvements to facilities, insufficient funding limits the number of new school construction and major renovation projects that take place each year. The legal requirements and best practices referenced in the *Guide* are followed closely by school districts undertaking new construction or major renovation projects, as they are required to submit their plans to MDE for [review and comment](#).

Schools are constantly faced with difficult decisions about the best use of limited dollars. Steering committee members, including MDE staff, noted that although many schools throughout the state likely see a need to improve their facilities, many lack the financial resources to take on a new construction or major renovation project. Schools that do not have an operating budget large enough to purchase bonds for these types of large projects must seek approval from local voters on a referendum that likely requires an increase in local taxes. Some grant dollars are available for critical building updates, and competitive grant programs to communities, such as SRTS grants, are also in place to fund some targeted efforts such as infrastructure improvements that link to existing school sites or other initiatives that address transportation and infrastructure needs in areas surrounding the school. School districts depend largely on the willingness of local residents to support these efforts, often by voting in favor of local tax increases.

In the absence of changes to school construction financing formulas and mechanisms to achieve equitable distribution of resources, revisions to the *Guide* may have a more direct impact on improving the quality of school facilities in more affluent communities, potentially widening gaps in the quality of school facilities and exacerbating disparities. Districts with greater financial resources and broader tax bases are likely to be much better positioned to secure the funding needed for major projects than smaller and less affluent school districts.

Recommendations: Predicted Health Impacts and Recommended Revisions to the *Guide*



ATS&R PLANNERS/ARCHITECTS/ENGINEERS

Because a formal process to revise the *Guide* has not yet begun, no specific proposed changes to the content of the *Guide* are currently under consideration by MDE for the HIA to analyze. This circumstance is atypical, in that most HIAs are initiated when a proposed policy or decision is under active consideration. Typically, an HIA informs decision-makers about how a proposed decision may influence the health of the affected populations and recommends changes that are predicted to have positive health outcomes. Instead, this HIA identifies text in the current *Guide*, which, if revised at the time of the next revision, could help Minnesota public schools implement policies and best practices known to optimize student health. Using an HIA framework for this analysis has provided an opportunity to consider the health impacts of potential revisions to the *Guide* in a new and structured way and to address particular content areas that might otherwise go unnoticed as being in need of, or benefitting from, revision.

Creating Decision Points and Predicting Health Impacts

To align our efforts with the HIA framework, we developed *alternate scenarios* (i.e., hypothetical proposed changes to the *Guide*) to create clear decision points for the HIA to analyze. The alternate scenarios address three broadly stated categories of measurable health determinants: **food environment**; **location efficiency**; and **physical activity**. Each alternate scenario was selected by the steering committee as a potential revision to explore through the HIA process. Key sources that were used to develop each proposed alternate scenario follow the suggested text change, in italics, where applicable.

The assessment was applied to the proposed changes in the alternate scenarios. To predict likely health impacts that would result if the proposed changes are added to the *Guide*, we reviewed the literature and the results of the assessment, provided rationales for making proposed changes, considered who

is most likely to be affected, discussed potential health outcomes, and created ratings to describe the strength of evidence for the potential health outcomes based on our review of current literature. Our analysis of the predicted health impacts is included in the discussion of the recommendations, below.

Developing Recommendations for Revisions to the *Guide*

After analyzing the health impacts predicted to occur if each of the changes proposed in the alternate scenarios is adopted in the next revision of the *Guide*, the HIA core team and steering committee members engaged in a multi-part discussion to determine whether to recommend those changes and whether to make any additional recommendations for changes to the *Guide*. The steering committee considered a number of additional, potential recommendations that aligned with the assessment results, reflected best practices identified in the literature review, and incorporated input from content experts, and selected several of these to include as HIA recommendations. Together, the recommendations express the collective will of the HIA core team and steering committee to:

- Provide guidance to stakeholders regarding mechanisms and resources to support the next revision of the *Guide* as well as ongoing revisions;
- Inform the decision-making process for revising the *Guide*;
- Increase state agency, local and regional government, and community engagement in the decision-making process for revising the *Guide*;
- Modernize the *Guide* by expanding its vision to embrace a Health in All Policies approach and by including design considerations that recognize health and health equity aims as critical to achieving academic success, social and emotional well-being, and community connectivity and civic goals; and
- Provide direct guidance to inform school siting, new construction, and major renovation decision-making processes in school districts throughout Minnesota and in other jurisdictions.

Framing Recommendations for Changes to the *Guide*

First and foremost, the recommendations are intended to inform the next revision of the *Guide* by encouraging contributors to incorporate the recommendations. In addition, the recommendations are designed to be used directly in local school districts to inform stakeholders about the HIA and enable them to apply the recommendations in their respective spheres and roles. This framing respects the *Guide's* overall purpose of providing stakeholders with timely summaries and links to applicable laws, regulations, and standards as well as to non-mandated, user-friendly guidance on design standards and best practices culled from respected sources.

The discussion about the recommendations for changes to the *Guide* is grouped by the four broadly stated categories selected by the core team and steering committee for analysis: **food environment**; **location efficiency**; **physical activity**; and **inclusive decision-making**. For the measurable categories (those other than inclusive decision-making), we provide a rationale for making proposed changes that are based on the alternate scenarios, describe who would most likely be impacted by those

proposed revisions, discuss some of the key health-related outcomes most likely to occur, and provide ratings to describe the strength of evidence for each potential change in health outcomes based on a review of current literature. Each discussion highlights additional factors that may influence health outcomes and lessons learned from schools that agreed to serve as case studies or granted interviews. After presenting the recommendations proposed in the alternate scenarios, we present the additional recommendations selected by the HIA core team and steering committee.

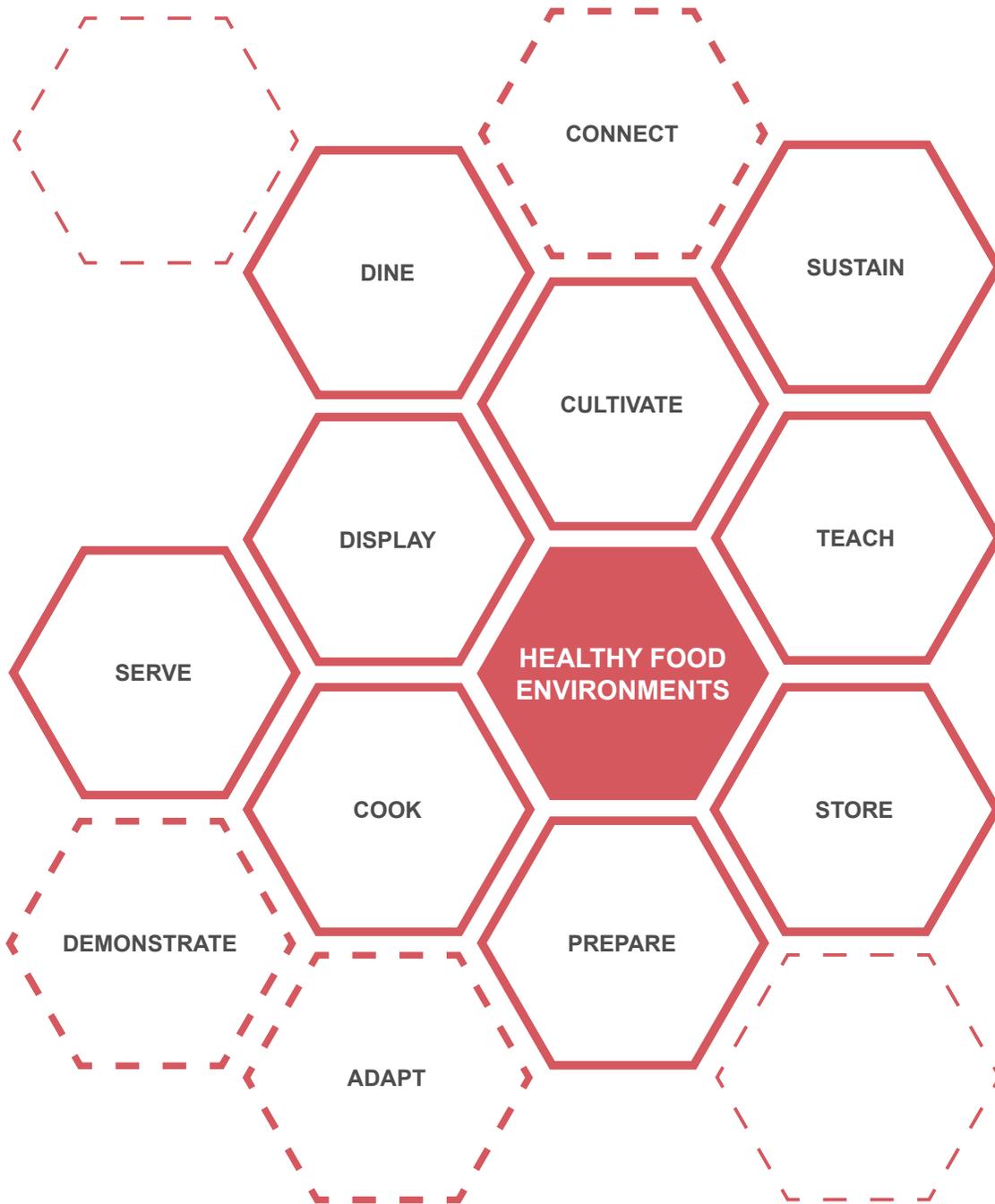
Each recommendation makes note of the section it corresponds to in the *Guide*. Recommendations relating to the food environment, location efficiency, and physical activity align primarily with two sections of the *Guide*: *Section II, Planning School Construction Projects*, and *Section III, Designing School Facility Spaces*. Recommendations concerning community use of school facilities and grounds also align with *Section IV, Related Issues, Considerations*.

1. *Guide, Section II, Planning School Construction Projects*: The purpose of Section II is to provide an overview of the planning process for school construction projects, including details on selected aspects. The HIA recommendations encourage specific changes regarding the descriptions of participants in the planning process and the steps of the planning process affecting site selection, and major renovation and new construction projects. The recommendations are geared toward state- and local-level stakeholders involved in planning and decision-making processes as well as state legislators, other policymakers, advocates, researchers, and advisors.
2. *Guide, Section III, Designing School Facility Spaces*: The purpose of Section III is to highlight important considerations in planning and designing school buildings and grounds. The current introduction to that section stresses the importance of considering evidence-based design features, specifically commenting, in bolded text, that research is “...*increasingly documenting the positive effect of quality school facilities...on student achievement and health, so any efforts that support quality facilities will pay important dividends for learners, school staff, and the parents that work with them.*” The HIA recommendations encourage inclusion of additional evidence-based design considerations in the next revision of the *Guide*, as well as in school districts’ local planning processes. The recommendations are geared toward stakeholders in the planning process: school district and site administrators, teachers, and staff; facility planners, architects, and engineers; transportation planners; other government stakeholders; and students, parents, and other interested community stakeholders.
3. *Guide, Section IV, Related Issues, Considerations*: This section is a catch-all for a number of issues that do not fit neatly into Sections II and III including but not limited to: partnerships with community groups, public agencies, and private users; urban and rural distinctions; security concerns; and sustainable design strategies. The recommendations encourage school districts to maximize opportunities for school-community partnerships through planning and design. They are geared toward school district and school site administrators, teachers, and staff; facility planners, architects, and engineers; transportation planners; government stakeholders, including local public health; students, parents, and other interested community stakeholders.

Because the recommendations that apply to inclusive decision-making processes are overarching and do not fit neatly into the *Guide*’s current structure these recommendations are presented separately, following the others.

FIGURE 20: Components of a Health Food Environment

(See [Appendix VII](#), created by VMDO Architects in partnership with Reitano Design Group and the Public Health Law Center)



Food Environment: Predicted Health Impacts and Recommendations

RATIONALE

Improving the school food environment in order to ensure that school meals and snacks are healthy, maximize nutritious content, and eliminate or greatly reduce unhealthy content, is a primary goal of the nutrition-related provisions of the federal Healthy, Hunger-Free Kids Act of 2010 and related state laws and initiatives. Not every school will convert to a full “prep” kitchen where all meals can be made from scratch; however, all schools, whatever their circumstances, can explore smaller, incremental, and less costly steps within their existing square footage, given good guidance.

The revisions to the *Guide* proposed in the alternate scenarios would enable school food services staff to store, prepare, and serve more fresh, healthy foods, including fruits and vegetables, and increase the steady availability of healthy food items (Figure 21). The proposed changes would also provide more specific guidance than currently exists in the *Guide* to enable planners to consider available options to improve student health and maximize the learning potential of food environment settings.

FIGURE 21: School food environment alternate scenarios

Current language in the <i>Guide</i>	Proposed revisions
<p>Suggested square footage guidelines are offered for school food service areas (3070-7700+ square feet for kitchen food preparation and serving areas); a number of design considerations that may influence the design features, space requirements, and suggested publications are listed, as well (<i>Guide, Section III, Designing School Facility Spaces, Part 3.08, Food Service, pp. 134-135; 139-140</i>)</p>	<p>Add specific guidelines to provide guidance for cooking from scratch:</p> <ul style="list-style-type: none"> ■ When designing a kitchen for preparing meals from scratch using fresh ingredients, allow 50 percent of kitchen space for food preparation and 50 percent for storage. Within the storage spaces, 50 percent of the total space should be for dry storage and 50 percent should be for refrigerated or frozen storage. Most (up to 90 percent) of the cold storage should be for refrigeration and the rest (10 percent or more) can be for freezers. <p>(Adapted from Center for Ecoliteracy, 2010)</p>
<p>The <i>Guide</i> notes that the square footage and design of school serving and cafeteria areas will vary greatly based on the school’s size and food service system, including the type and quantity of meals served. A general recommendation is offered to give “special consideration” to the layout of serving lines. (<i>Guide, Section III, Designing School Facility Spaces, Part 3.08, Food Service, pp. 134-135; 139-140</i>)</p>	<p>Include specific design features that increase the availability and consumption of healthy foods and maximize student time for and enjoyment of eating and socializing:</p> <ul style="list-style-type: none"> ■ Provide a minimum of one food service line per 100 students served during a lunch period; ■ “Scramble design” stations should be considered for middle and high schools. ■ Display fruits and vegetables prominently and position them before entrees in schools with a single serving line. <p>(Adapted from Center for Ecoliteracy, 2010; Huang, et al., 2013; Just & Wansink, n.d.)</p>



Without allocating more space for refrigerator and freezer storage, for example, schools will lack the space needed to store fresh produce and ingredients or increase the frequency of food deliveries, which can increase delivery costs and staff time expenses. The proposed changes to serving areas and display of foods might also encourage more schools to consider ways to create flexibility in their food serving areas and to be mindful about their display of foods. Again, some practices can be encouraged without undertaking a major renovation project. Schools can make a number of improvements to the layout of school lunch lines and food displays to make fresh fruits and vegetables more appealing. We are not able to quantify the number of schools that currently have such design features in place. Given the growing interest in school-based programs that encourage preparation of meals from scratch, farm to school programs, and school gardens, interest in kitchen and cafeteria renovation projects appears likely to become a higher priority among school districts.

ANTICIPATED CHANGES IN THE SCHOOL FOOD ENVIRONMENT

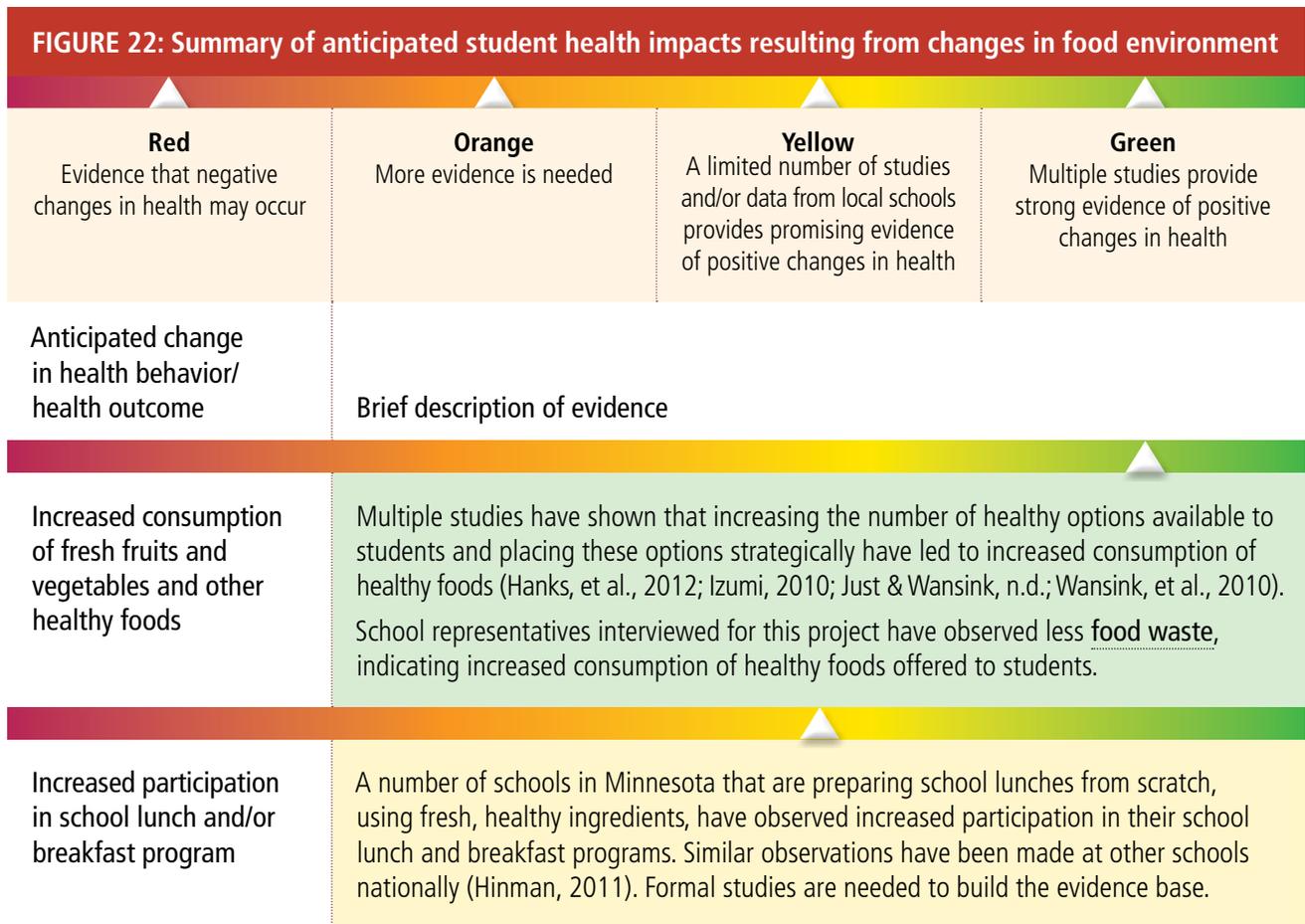
The steering committee identified two inter-related questions related to the food environment that they felt would be helpful to address in the HIA:

- How would revisions to the *Guide* affect and/or increase the number of school districts that consider healthy eating policies and practices in school construction decision-making processes?

- How would revisions to the *Guide* affect and/or increase the number of schools that design or redesign indoor food environments to promote increased access to and consumption of healthy foods?

By including the proposed changes in the next revision of the *Guide*, schools undergoing new construction and major renovation projects would have best practices guidance and resources necessary to design and build a kitchen with capacity to prepare and serve meals made from scratch, adequate space to refrigerate or freeze produce and other grocery items that can be used to prepare healthy meals, and greater flexibility to serve food in ways that will encourage students to select fresh produce and other healthy food items.

The review of existing literature found strong evidence that implementation of these changes would lead to greater consumption of fresh fruits and vegetables, and promising evidence that the changes would result in increased participation in the school meal program, improved classroom attention, and reduced absenteeism among students (Figure 22). More research is needed to predict the degree to which these changes will result long-term academic success and overall reductions in student overweight and obesity.



(continues)

FIGURE 22: Summary of anticipated student health impacts resulting from changes in food environment (continued)

<p>Red Evidence that negative changes in health may occur</p>	<p>Orange More evidence is needed</p>	<p>Yellow A limited number of studies and/or data from local schools provides promising evidence of positive changes in health</p>	<p>Green Multiple studies provide strong evidence of positive changes in health</p>
<p>Anticipated change in health behavior/ health outcome</p>	<p>Brief description of evidence</p>		
<p>Reduction in school absences</p>	<p>A few studies have explored the relationship between schools using fresh ingredients in school meals and school attendance rates, with one school reporting a 14 percent reduction in absences after making changes to their school meal (Pan, Sherry, Park, & Blanck, 2013).</p>		
<p>Increased classroom attentiveness</p>	<p>In published studies and at local schools, teachers and school administrators have observed that students are more alert and attentive in class after implementing changes to provide healthier food options (Golley, et al., 2010; Hinman, 2011).</p>		
<p>Improved academic performance</p>	<p>There is limited evidence of improved classroom performance among students who attend schools that provide healthier food options. Studies that have demonstrated a relationship between healthier food options and improved academic performance have focused on students who are experiencing hunger, food insecurity, and/or poor nutrition or schools that made dramatic changes that substantially improved the quality of food available to students (Bradley & Greene, 2013; Belot & James, 2011). Additional research is needed to explore the impact of more incremental changes in the school food environment, as well as the relationship between improved nutrition and academic performance for different student populations and in multiple school settings.</p>		
<p>Reduced prevalence of childhood overweight and obesity</p>	<p>A systematic literature review commissioned by the United States Department of Agriculture (USDA) concluded that increased consumption of fruits and vegetables may reduce the risk of overweight and obesity in children, but notes additional research is needed as the evidence is based on relatively few studies (Dietary Guidelines Advisory Committee, 2010).</p> <p>In Minnesota, rates of childhood obesity among lower-income preschool-age children have declined since 2008 (Centers for Disease Control and Prevention, 2014). During that timeframe, a number of statewide campaigns, such as the Statewide Health Improvement Program, have been implemented that promote breast-feeding and healthier food options in childcare settings and schools, suggesting that these policies are leading to reductions in obesity. However, statewide trend data are not available for school-age children.</p>		

ANTICIPATED CHANGES IN STUDENT HEALTH

Potential reach: *The proposed revisions related to the school food environment have the potential to impact the health of all students and staff of schools that are planning a new construction or major renovation project.* Schools that design a kitchen space with adequate food preparation and storage areas will be better equipped to do more on-site cooking from scratch using fresh produce and other healthy food options (The Pew Charitable Trusts & Robert Wood Johnson Foundation, 2014). Similarly, changes to the design of the food serving areas will increase student access to healthy food options by making fruits, vegetables, and other healthy snacks a more convenient and appealing choice. These changes can make healthy food options more readily accessible to all students and staff who eat meals prepared by the school, leading to changes in consumption of healthy foods (Hanks, et al., 2012; Izumi, 2010; Just & Wansink, n.d.; Wansink, et al., 2010). We are not able to quantify the number of schools that currently have these types of design features in place. Based on recent new school construction and major renovation data provided by MDE, however, we estimate that approximately 40 new renovation and construction projects with updates to the school kitchen may occur annually.

Magnitude of impact: *Some students may experience more significant changes in their health than others as a result of these proposed revisions.* For students in good health who already consume the recommended servings of fresh fruit and vegetables, the proposed changes to the *Guide* are likely to simply reinforce healthy eating behaviors. The proposed revisions would potentially have a more significant positive health impact among students who do not regularly consume fruits and vegetables and/or have health conditions that are impacted by diet such as diabetes and overweight or obesity. Students from lower-income households, who may rely more heavily on school meal programs for nutritious meals, including those who have experienced food insecurity, would likely be among the students most significantly impacted by the proposed changes.

At a statewide level, the proposed changes to the *Guide* would increase the capacity of a greater number of Minnesota K–12 schools to participate in increasingly popular and evidence-based programs and initiatives such as farm to school programs and school gardens. These programs have social benefits beyond improved eating behavior. Gardening activities provide opportunities for students to develop positive relationships with their peers, as well as with school staff, parents, and community residents (Maller, 2005). These social benefits (e.g., increased social capital) can also extend to community residents involved in planning and maintaining the garden (Bell & Dymont, 2008). Students who participate in these programs can also gain essential knowledge about where food comes from, how products are grown, and their role in a healthy diet (Ritchie & Chen, 2011). A state-level shift in the overall capacity of schools to make healthy foods accessible to students would likely evolve over many years as existing schools undergo major renovations and as new schools are designed and built.

At a local level, individual schools that improve the food environment are likely to observe changes in rates of participation in their school lunch and breakfast programs, as well as increased consumption of fresh fruits and vegetables and other healthy food options. The degree to which changes in access to healthy food will change behavior will vary, as student behavior may be influenced by a number of factors including eating habits established at home, the presence of visually-appealing displays and signage at school, and social norms within their peer group (Perry et al., 2004; Story, Neumark-

Sztainer, & French, 2002) as well as classroom instruction. There is potential for significant changes to occur — statewide, less than half of 9th grade students who responded to the Minneapolis Student Survey (2013) consume even a daily serving of fruit (43%) or vegetables (40%).

OTHER CONSIDERATIONS

For many schools, the kitchen’s design, but not necessarily its square footage, must be modified to create adequate space to prepare meals. In addition, many schools need new appliances in order to shift from being *reheat kitchens* to *scratch-cooking kitchens*. The amount of storage space needed for each school may vary considerably, based on the number of students who attend the school and how often food deliveries are made. However, the general ratio between storage space and food preparation areas likely applies to all schools.

Schools can make a number of additional changes to optimize the positive health impacts that can occur as a result of healthy changes in eating behavior. With adequate food preparation and storage areas, schools are better equipped to participate in local farm to school programs and to prepare produce grown in school gardens, ultimately enabling schools to offer more nutritious meal options (Gibson, et al., 2014). Schools can also encourage students to eat healthy foods through other programmatic and policy changes such as stocking healthy foods and beverages in vending machines, changing locations of vending machines or eliminating them, adopting healthy classroom event policies, and incorporating nutrition information about healthy eating and information about food production into classroom curricula.

Although the current edition of the *Guide* provides schools with few, if any, programmatic recommendations, it is important to note that some of the changes recommended in this HIA can be accomplished without undertaking a major renovation project. The Minnesota Food Charter outlines a number of strategies that teachers, school administrators, food service staff, parents, and students can take to increase opportunities for healthy eating at school (Minnesota Food Charter, n.d.). Given the growing interest in increasing access to healthy and affordable food across the state and the growing number of school-based programs that encourage preparation of food from scratch, farm to school programs, and school gardens, interest in kitchen and cafeteria renovation projects appears likely to become a higher priority among Minnesota school districts. The Minneapolis Public School District, for example, is investing significant funding to remodel its central kitchen and kitchens in individual schools to increase the capacity of schools to do more cooking with fresh ingredients.

Behavior change takes time and reinforcement through shifts in school-wide culture. There is a growing body of literature that describes ways that the placement and display of healthy foods can have a positive impact on healthy eating behavior (Babio, 2014; Center for Ecoliteracy, 2010; Hanks, et al., 2012; Huang, et al, 2013; Just & Wansink, n.d.; Thorndike, et al., 2014; Wansink, 2010). While many promising practices and strategies are available for schools to use, there is no single design layout or food display template that can ensure students will consume healthier foods more regularly. Schools need to be willing to try new approaches and to modify their strategies as they learn from students about their food preferences and establish new social norms and a school-wide culture that fosters the consumption of healthy foods.

To help visualize potential changes to school kitchens and cafeterias such as those that might result from proposed changes to the *Guide*, we have included an illustrative exhibit, commissioned for this HIA, that depicts kitchen and cafeteria components design principles that are consistent with the project's findings and recommendations ([Appendix VII](#), created by VMDO Architects in partnership with Reitano Design Group and the Public Health Law Center).

LOCAL EXAMPLES

Case studies conducted as part of this HIA and key informant interviews with representatives from other schools in the state provide examples of ways schools are improving the food environment and the results of these changes.

- The kitchen at Case Study School B's former facility was too small to support preparation of meals from scratch and lacked the refrigeration and freezer storage space necessary to offer students a variety of fresh produce and entrée options at each meal. The new school's kitchen space has storage capacity that aligns closely with the recommended alternate scenario. School nutrition staff members have observed that by offering a wide range of fruit and vegetable options to students as well as multiple entrées, they are able to meet the United States Department of Agriculture (USDA) requirements and reduce the amount of food waste. In 2013, two years after the new school opened, self-reported student consumption of fruits and vegetables was still relatively low; less than one-third of 8th grade students reported eating at least one daily serving of fruits (31%) or vegetables (29%) during the past week. However, school staff members have observed a notable increase in school lunch program participation (88% now, compared to 78%-82% at the former site in 2011–12, depending on grade levels), and that very few students now bring lunches from home. As the vast majority of students are now eating school-prepared meals that include servings of fruits and vegetables (and teachers, too, have increased their participation in the school lunch program), changes in social norms around healthy eating are more likely to occur. There is potential for significant improvements in consumption of fruits and vegetables, a change that would support student health and well-being more broadly.
- The Minneapolis Public Schools, one of the state's largest school districts, has seen a notable increase in school lunch participation since introducing a number of kitchen renovations, changes to cafeteria design, district policies, and school programs, from 56 percent in the 2010-11 school year to 66 percent in the 2013-14 school year. Most of that increase is among the 35 percent of students who pay full price for school meals, generating additional revenue for the district. Their shift to healthier ingredients and meals is particularly important to the nearly 24,000 students from lower-income households who qualify for free or reduced-price meals and may be less likely to have access to high-quality nutritious meals at home.
- Changes in the school food environment can be made without investing in a new school facility or a major renovation project. In one rural community, a school garden program has grown dramatically because of the collaborative support and involvement of school staff and community residents. The school garden program began with a few small garden beds and has gradually grown to include a greenhouse, over two dozen garden beds, and a fruit orchard, with plans for expansion. Students assist with all aspects of the school garden as part of their classroom instruction and to fulfill the school's student volunteering requirements. Community residents volunteer to help care for the garden over the summer months when school is not in session. Produce from the garden is incorporated into salad bar options and/or sold or given to community residents; proceeds from sales are used to support and expand the program.

RECOMMENDATIONS FOR CHANGES TO THE *GUIDE TO IMPROVE THE FOOD ENVIRONMENT*

After reviewing the assessment results, the steering committee recommended that the proposed language introduced through the alternate scenarios be included in the revision of the *Guide*, with one revision (noted below in italics):

Add the following guidelines to provide guidance for cooking from scratch in *Section III, Designing School Facility Spaces, Part 3.08*:

- When designing a kitchen for preparing meals from scratch using fresh ingredients, allow 50 percent of kitchen space for food preparation and 50 percent for storage. Within the storage spaces, 50 percent of the total space should be for dry storage and 50 percent should be for refrigerated or frozen storage. *The ratio of storage space allocated for refrigerated and frozen foods should be determined with input from the school's food nutrition director and staff.*
- Include specific examples of design features that increase the availability and consumption of healthy foods and maximize student time for and enjoyment of eating and socializing in *Section III, Designing School Facility Spaces, Part 3.08*, including:
 - » Provide a minimum of one food service line per 100 students served during a lunch period;
 - » “Scramble design” stations should be considered for middle and high schools;
 - » Display fruits and vegetables prominently and position them before entrees in schools with a single serving line.

In addition, the steering committee identified several more recommendations that would help ensure the revised *Guide* reflects current best practices and promising strategies to create a healthy school food environment for students. These recommendations align with the assessment results and were informed by the review of the literature and discussions with content experts and steering committee members.

Planning School Construction Projects (Section II):

- Modify the description of participants in the planning process to specify that “support staff” includes food service directors and that “local or regional government officials” includes local public health staff and transportation and land use planners (*Part 2.01*).
- Add food service directors and local public health staff to the list of suggested participants in a school facilities planning committee (*Part 2.02 (a)*).
- Provide transparency in the planning process whenever possible, and step-by-step opportunities for public comment (*Part 2.01*).

Designing School Facility Spaces (Section III):

- Make note of the growing need to increase the capacity of food service staff to support legislated policy changes and related program initiatives affecting meal service (*Part 3.08, Guidelines for School Support Space, introduction*).
- Include specifications for providing access to drinking water in the cafeteria (*Part 3.08(a), (e)*).

- Include specifications for a salad/fruit and vegetable bar (*Part 3.08 (a), (e)*).
- In the discussion of multi-purpose uses of cafeterias, activities, equipment, storage, other needs), note potential food service scheduling conflicts and storage needs as well as food handling, security, and safety considerations (*Parts 3.03 and 3.08(e)*).
- Encourage school districts to develop a comprehensive site plan that includes potential outdoor dining and education spaces such as a fruit and vegetable garden (*Part 3.08(e)*).
- Include guidance on: kitchen/cafeteria designs that support storage, preparation, and service of healthy food, including preparation of meals from scratch; comfortable seating, technology access, mobile food demonstrations, flexible configurations, and furniture options that encourage small groupings, dining clusters, and perimeter seating to stimulate enjoyment of the cafeteria as a dining and learning environment; and use of graphics, visual stimuli, open physical designs, natural daylight, and food displays to generate student/staff excitement about healthy eating (*Part 3.08(e)*).
- Note that locating complementary spaces near the kitchen/cafeteria can promote collaboration and efficiencies (e.g., a family and consumer science classroom, or physical activity areas used before or after school meals) (*Parts 3.03 and 3.08(e)*).

Location Efficiency: Predicted Health Impacts and Recommendations

RATIONALE

We have proposed two alternate scenarios aimed at influencing decisions concerning location efficiency: one focused on the amount of land needed for a school facility and the other to better consider the school's location in proximity to students and community residents (Figure 23). Together, the proposed revisions, and the additional recommendations that follow, emphasize the relationship between a school's location and the community it serves and encourage consideration of all forms of transportation to school, not only transportation by automobile and bus. It should be noted that while school siting decisions can significantly influence transportation needs and related motor vehicle emissions and traffic safety concerns, these issues are not addressed directly in this HIA.

ANTICIPATED CHANGES AFFECTING LOCATION EFFICIENCY

The steering committee identified two key questions related to location efficiency that they felt would be helpful to address in the HIA:

- How would revisions to the *Guide* impact the types, quantities and qualities of physical infrastructure at schools or how schools are incorporated into the existing infrastructure or built environment?
- Would changes to the *Guide* affect the proximity of schools to homes and community destinations, including other safe places for physical activity?

The proposed changes are intended to continue to give schools the flexibility to consider a broad range of sites for future new construction projects. Members of the steering committee noted, though, that

FIGURE 23: Location efficiency alternate scenarios

Current language in the <i>Guide</i>	Proposed revision(s)
Suggested acreage requirements are listed, ranging from 10-15 acres for elementary school sites, to 35-40 acres for K–12 schools or small high schools (<2,000 students) (<i>Guide, Part 2.07, p. 49</i>).	Remove minimum acreage requirement but encourage consideration of adequate spaces for outdoor play, shared use agreements (that reduce the need for larger acreage), future building expansion needs, on-site stormwater drainage, and well-planned student arrival/departure areas. (<i>Adapted from Lawrence, 2003; McDonald, et al. 2014; discussion and recommendations from HIA steering committee</i>)
Guidance on selecting the location of a school focuses on centrality and accessibility to vehicles and public transit (<i>Guide, Part 2.07</i>). “The school site should be located near the following: <ul style="list-style-type: none"> ■ Center of community/school district ■ Student population concentrations/growth area ■ Community resources and potential school/ community partnership sites ■ Major connecting roads and bus lines that afford easy access to the site ■ Site expandable areas Bus routes limiting travel time for students” (<i>Guide, Part 2.07, p. 50</i>).	Revise guidance offered to schools on siting decision to also include maximizing the number of students who live within the school walk zone and to redefine “center of community/school district” to mean a location near current/anticipated centers of student population growth. (<i>Developed through discussion and recommendations from steering committee</i>)
No recommendations are made in the <i>Guide</i> regarding specific tools and/or approaches that should be used when identifying and evaluating potential school sites (<i>Guide, Part 2.07</i>).	Require conducting a walkability and bikeability assessment as part of the consideration of a new school site, including a description of how infrastructure challenges will be addressed in the new school construction project. (<i>Adapted from ChangeLabSolutions, 2012; discussion and recommendations from HIA steering committee</i>)

at a practical level, communities often have a very limited range of available site options. For schools in urban areas, it is often necessary to build on existing school sites, as there may be few available parcels of undeveloped land. These schools may need to consider opportunities for shared use or co-location agreements in order to offer a full range of academic, athletics, and fine arts opportunities. In rural areas, it may be more feasible to attain a site with larger acreage, as land on the periphery of a community may be much less expensive in the short-term. However, there may be higher transportation costs or more costs to the community for infrastructure enhancements, for example, to improve connectivity between the school and the community.

By revising the language in the *Guide* to modify the focus formerly placed on a recommended minimum number of acres for a school site to, instead, recommend and emphasize the importance of a site’s proximity to residential areas or to areas of anticipated residential growth, a school district’s selection

of new construction sites may make it easier for students and adults to walk and bike to school and provide greater opportunities for shared use and/or co-location of community programs and services.

It is important to note that the most densely populated areas are not necessarily located in the center of a community. Schools built on the edge of a community, but near residential development zones that invest in walking and biking infrastructure, can still increase accessibility to walking and biking to school. Revising the language to recommend that schools be located near population centers rather than in the geographic center of a school district may encourage school districts to select a site within a community, rather than selecting a seemingly neutral site located in a place that may be in the geographic center yet lack any surrounding neighborhood or community infrastructure.

The review of the literature found strong evidence that the proposed revisions to the *Guide* would lead to increases in student physical activity if the infrastructure surrounding the school provides students with safe walking and biking routes (Figure 24). In addition, there is promising evidence that when students are able to walk or bike to and from school, they are more attentive in the classroom and achieve better academic outcomes. More research is needed to understand whether these changes will ultimately lead to changes in rates of student overweight and obesity.

ANTICIPATED CHANGES IN STUDENT HEALTH

Potential reach: *The proposed revisions regarding school siting decisions are most likely to impact a relatively small number of students who live within the walk/bike zone of a current or proposed school location; expanding programmatic components could expand reach significantly.* New school construction projects occur relatively infrequently. Based on recent construction and renovation data provided by MDE, an estimated 15 new schools may be constructed statewide each year. It is not possible to estimate how changes to the *Guide* would affect the number of homes in proximity of schools at a statewide level. School walk/bike zones extend one-half mile from elementary schools and one mile or more from secondary schools. Even in more densely populated urban areas, a relatively small proportion of students may live within the zone where busing is not provided. Reasonable distances for students to walk or bike to school could potentially extend further than the school's walk or bike zone. Assuming that most students would be willing to spend up to 30 minutes walking or biking to school, a walk zone could extend to 1.35 miles while biking distances could extend to 2.5 miles from a school (National Center for Safe Routes to School, n.d.).

Walking and biking before and after school may be more appealing to secondary school students if there are safe paths and routes connecting the school to nearby businesses, athletic fields, recreation centers, park buildings, trails, and other places where students are likely to spend time before and after school. A school's location may also impact how feasible it may be to implement a remote drop-off program, where students who take the bus are dropped off at a location within the school's walk zone and then walk together to school, accompanied by school administrators, teachers and adult volunteers. Conducting a walkability/bikeability assessment of a potential new school site may eventually help maximize the number of students who can be more physically active by fostering collaborative planning efforts between the school district and the community.

Magnitude of impact: *Some students may be more strongly impacted by school siting decisions than others; however, there are opportunities to broaden these benefits.* Among 9th grade students, 54 percent of boys

FIGURE 24: Summary of anticipated health impacts resulting from changes affecting location efficiency

<p>Red Evidence that negative changes in health may occur</p>	<p>Orange More evidence is needed</p>	<p>Yellow A limited number of studies and/or data from local schools provides promising evidence of positive changes in health</p>	<p>Green Multiple studies provide strong evidence of positive changes in health</p>
<p>Anticipated change in health behavior/ health outcome</p>	<p>Brief description of evidence</p>		
<p>Increased physical activity</p>	<p>There is strong evidence that SRTS programming is an effective approach for increasing the number of students who walk/bike to school (Chillon, et al., 2011, National Center for Safe Routes to School, 2012; Orenstein, 2007). A recent three-state study found SRTS improvements resulted in an 18 percent relative increase in biking and walking, as well as evidence of continued increases in active transportation over time (McDonald, et al., 2014). These results are consistent with studies exploring the impacts of SRTS programming on walking and biking in more targeted geographic areas (Buckley, et al., 2013; McDonald, et al., 2013; U.S., EPA, 2008; U.S., EPA, 2003).</p> <p>Neighborhood characteristics may be important to consider. A study found that the number of students who walked or biked to school was seven percent higher when the school was located in neighborhoods with higher levels of residential density, a factor that would be considered if the <i>Guide</i> encourages school districts to identify sites in areas near population centers (U.S., EPA, 2008).</p>		
<p>Improved classroom attention, academic performance</p>	<p>Studies have demonstrated that students perform better on standardized tests, have better grades, and have better cognitive skills that support learning, such as concentration, attention, and behavior when they are physically active (Robert Wood Johnson Foundation, 2011; Whitt-Glover, et al., 2013). School representatives who participated in the HIA key informant interviews also observed students being more focused after being physically active for even brief periods of time.</p> <p>More research is needed, however, as some studies have not found a connection between physical activity and changes in classroom behavior (CDC, 2010).</p>		
<p>Reduced prevalence of childhood overweight and obesity</p>	<p>Although the proposed revisions are likely to result in increased levels of physical activity, relevant studies have not shown consistent reductions in body mass index (BMI) and rates of overweight/obesity (Active Living Research, 2013).</p>		

and 33 percent of girls are physically active at least 60 minutes, five or more days a week. Students who live within a school's walk/bike zone and who walk or bike to school may be more likely to have higher levels of physical activity, yet relatively few students live within any school's walk or bike zone. If remote drop-off locations are used, the total number of students who have increased levels of physical activity could increase dramatically. It is important to note that students are unlikely to attain 60 minutes or more of physical activity through active transportation to and from school alone; active transportation can increase physical activity, but it needs to be one of multiple ways that students are active each day.

OTHER CONSIDERATIONS

Rural school districts can increase access to walking and bicycling by implementing remote drop-offs.

Rural school districts can increase access to walking and bicycling by supporting remote drop-off for all students who are transported to school by bus or by motor vehicle. Students can safely walk or bike when consideration is given to where a school is sited and when appropriate spaces are included in the design of the facility and grounds.

Urban and rural schools face different challenges when selecting school sites. To a large degree, rural and suburban schools have more siting options available than schools in urban areas. While there are certainly a limited number of feasible options in any geographic setting, in urban areas many older schools are located in residential areas where large undeveloped spaces are simply unavailable. In these situations, school districts may want to consider creative ways to partner with community recreation centers or other community assets to ensure that the school can provide adequate spaces for athletics and other programs. A building with a smaller footprint may be desirable, with options developed to increase the school's size by building up, rather than out, if and when expansion becomes necessary at some point in the future.

SRTS programs are most effective when implemented comprehensively. The built environment around a school has a significant impact on whether or not students can safely walk or bike to school. Schools with successful SRTS programs also offer secure bicycle parking, use a high-quality bicycle and pedestrian safety curriculum such as *Minnesota Walk! Bike! Fun!*, and identify safe walking and biking routes. They may provide other programming and support to encourage walking and biking such as a walking school bus for elementary students, where a walking route with established stops allows students to join a group of others on a walk to school led by adult volunteers and/or school staff.

School employees can lead by example. Schools are often large employers within a community and can offer their staff worksite wellness initiatives to support health. Incentives to walk or bike to work can be provided through these wellness efforts. Information about worksite wellness strategies being used in Minnesota can be found on the Minnesota Department of Health website.¹

Minnesota's cold climate may deter walking and bicycling during winter months. During the winter months in Minnesota, parents often prefer to drive their children to school despite living within the walk or bike zone. Cold temperatures and icy or unplowed sidewalks are commonly cited barriers.

¹ www.health.state.mn.us/divs/oshii/worksite; also, see *School Employee Wellness: A Guide for Protecting the Assets of Our Nation's Schools*, Directors of Health Promotion and Education (n.d.), http://www.dhpe.org/members/group_content_view.asp?group=87568&cid=124831.

Coordinating with cities and communities to prioritize the clearing of sidewalks surrounding schools can help alleviate some of these concerns, but engagement with parents is essential to promote walking and biking to school year-round.

Use of efficient design solutions can minimize a school's footprint. When estimating the space required for meeting a school's needs, consideration can be given to ways to optimally use space. For example, a rooftop school garden can make use of an otherwise unused area while still providing an outdoor educational space. Efficient use of space allows a school to reduce its footprint or to create non-traditional spaces that promote physical activity, such as learning spaces outside of the classroom that give students opportunity for brief movement breaks.

Consideration of adjacent community assets and development of shared use agreements can increase access. Siting schools next to parks, community recreation centers, medical centers and other community assets can potentially grant students access to these facilities through shared use agreements, eliminating the need for the school to build these facilities themselves.

LOCAL EXAMPLES

Case studies conducted as part of this HIA and key informant interviews with representatives from other schools in the state provide several examples of ways schools are working to encourage student physical activity to and from school and engaging in effective public-private partnerships:

- *Case Study School A* is located in an urban residential area, yet district representatives estimate that less than 25 percent of students live within the school's one-mile walk zone. The school encourages students to walk and bike to school, but some barriers to walking and biking still need to be addressed. Although a nearby street has a designated bike lane, the bike path does not extend completely to the school grounds.

The school has developed a crossing guard program to help ensure student safety at problematic intersections and would like to work with the city to consider implementing additional safety features. The school has worked closely with the school district to plan and implement a *school bus stop and walk route*, where students who ride the bus to school are dropped off at a location approximately one-half mile from the school one day per week and then walk together the remainder of the distance to the school, with participation of and supervision by school staff and parents. Using this approach on designated days, the vast majority of students are physically active before the start of the school day. The principal of the school has observed that the noise level in the school commons is lower, and that students seem more relaxed, on the weekday when *school bus stop and walk* takes place.

- In a school district survey of 39 school staff members whose school has participated in a *bus stop and walk* program for more than a year, nearly all of the staff (97%) reported that children arrive at school more alert and ready to learn on days when the *bus stop and walk* is conducted. These school staff observations align with recent studies examining the relationship between physical activity and academic success cited in the literature review. Although changes in student physical activity levels have not been evaluated for schools that participate in a *bus stop and walk* program, studies of walking school bus programs, where designated routes are created with stops along the way, have shown that participating students have higher levels of moderate to vigorous physical activity and have gained less body fat than students who do not walk or bike to school (Mendoza, et al., 2011).

- Public-private partnerships helped a rural school district save money and increase physical activity among its students. With one wing of a school in desperate need of renovation, the district, city, and county decided to rent the space to a local YMCA. As a result of this co-location, the school district is projected to save about \$300,000 in renovation costs and \$40,000 per year in maintenance and heating costs. Students have gained access to a newly renovated recreation center with an additional 15,000 square feet of new space, including a new pool. As a result, students are more active, particularly during the winter months when they have a limited number of places to spend their free time. In addition, more high school students appear to be taking elective physical education classes compared to before the recreation center opened. In the spring semester of 2014, 46 percent of 11th and 12th grade students took physical education, compared to just 12 percent of 11th and 12th graders in the spring of 2012 before the new YMCA opened its doors.
- A suburban school district is home to a full-service community school district that is focusing on the holistic needs of its residents. In 2009, the school district converted two classrooms into a full-service clinic that provides free access to medical, dental, mental and vision health services. The school district forged public-private partnerships with nine health service organizations to provide support, including a foundation which funded the initial \$250,000 renovation. Within four years, student absences dropped by over 27percent. This innovative approach demonstrates the impact that public-private community partnerships can have when health-promoting services are brought to school facilities.

RECOMMENDATIONS FOR CHANGES TO THE *GUIDE TO IMPROVE LOCATION EFFICIENCY*

After reviewing the assessment results, the steering committee recommended that the proposed language introduced through the alternate scenarios be included in the revision of the *Guide* with a one correction, noted in italics, noting the proposed change would be recommended, not required.

Add the following guidelines to the *Guide, Section II, Part 2.07*:

- Remove minimum acreage requirement but encourage consideration of adequate spaces for outdoor play, shared use agreements (that reduce the need for larger acreage), future building expansion needs, on-site storm water drainage, and well-planned student arrival/departure areas. (*Adapted from Lawrence, 2003; McDonald, et al. 2014; discussion, recommendations from HIA steering committee*)
- Revise guidance offered to schools on siting decisions to also include maximizing the number of students who live within the school walk zone and to redefine “center of community/school district” to mean a location near current/anticipated centers of student population growth. (*Developed through discussion and recommendations from steering committee*)
- Recommend conducting a walkability/bikeability assessment as part of the consideration of a new school site, including a description of how infrastructure challenges will be addressed in the new school construction project. (*Developed through discussion and recommendations from steering committee*)

The steering committee also identified a number of other recommendations to help ensure that the revised *Guide* reflects current best practices and promising strategies to improve location efficiency for the benefit of students, families, school staff, and community members. These recommendations align with the assessment results and were informed by the review of the literature and discussions with content experts and steering committee members.

Planning School Construction Projects (Section II) and Related Issues, Considerations (Section IV):

- Promote community cohesion and investment through active community participation in the planning process (*Parts 2.01 and 4.01*).
- Amend the current list of locations that school sites should be located near to add safe pedestrian and bicycle routes (*Part 2.07(b)*).
- Encourage school districts to coordinate or collaborate with local governments and regional planners on long-term planning efforts such as comprehensive plans, transportation plans such as Complete Streets and SRTS, and school 5- or 10-year facilities plans (*Sections II and IV, Part 4.01*).
- Supplement the current language on school-community partnerships to encourage school districts to explore options for co-locating a school facility with another community asset, e.g., a park building, municipal/non-profit recreation or community center, medical health center, or public library (*Parts 2.07(b) and 4.01*).
 - » Provide guidance and/or links to publications on potential public/private partners with blended funding or other capacity to enter into agreements.

Designing School Facility Spaces (Sections III) and Related Issues, Considerations (Section IV)

- Emphasize that schools should anticipate and plan for increased community interest in the use of new and renovated school facilities (*Parts 3.03 and 4.01*).
- Provide design specifications for parking lots, entrances, and bus and car drop-offs to ensure the safe and unobstructed flow of non-motorized active transportation and pedestrian traffic, including clearly marked entrances and appropriate way-finding (*Section IV*).
- Include specifications for secure storage of a bicycles, a bicycle fleet, and space for bicycle repair/maintenance (*Section IV*).

Physical Activity: Predicted Health Impacts and Recommendations

RATIONALE

We have proposed three alternate scenarios, focusing on two parts of a public school campus that can be used to encourage physical activity — the school grounds and indoor spaces that can be used for physical activity (Figure 25). The current language in the *Guide* addresses both indoor spaces and school grounds, but does not address how these areas can be best utilized to support and encourage physical activity among students and community members.

ANTICIPATED CHANGES TO SCHOOL GROUNDS AND INDOOR AREAS

The steering committee identified two key questions related to school grounds and indoor spaces that support physical activity that they felt would be helpful to address in the HIA:

FIGURE 25: Physical activity alternate scenarios

Current language in the <i>Guide</i>	Proposed revisions
<p>Recommended space needs for elementary, junior high, and high school physical education areas are described, but are not provided as a ratio to students. (<i>Guide</i>, Parts 3.05(l), 3.06(m), and 3.07(n)).</p>	<p>Athletic facilities: Change square footage guidance to reflect capacity needs (e.g., 1 teaching station of 7,000 square ft. per 500 students) for physical education instruction and physical activity during the school day.</p> <p>Also, consider separately the gymnasium space needs for athletic team practices, community recreation use, other afterschool activities, and/or opportunities for shared use agreements with community facilities that can leverage available spaces.</p> <p><i>Adapted from Maryland Public Schools’ Physical Education Facilities Guidelines for New Construction and Major Renovations, 2011; feedback and discussion with Steering Committee members.</i></p>
<p>Classroom square footage recommendations are provided for different grade levels. The <i>Guide</i> encourages consideration of classroom location, as well as the space needed for learning activities, use of technology, and storage. Flexibility to support active classroom practices is not mentioned. (<i>Guide</i>, Parts 3.04, 3.05(e), 3.06(c), and 3.07(c)).</p>	<p>Active classroom: Recommend incorporating features that support active classroom practices into the design of indoor school spaces (e.g., selection of classroom furniture that can be easily moved to allow for physical activity breaks and active, configurable learning spaces; selection of flooring and acoustical materials that minimize wear and reduce noise from other classrooms or spaces that may distract student learning; and placing classrooms in close proximity to outdoor green spaces and other spaces, such as a commons area, that can be used for brief periods of physical activity).</p>
<p>Although acreage minimum requirements are listed for all types of school facilities, the current language does not reference the features that should be included in outdoor play and physical activity areas.</p>	<p>Use of school grounds: Recommend the design of outdoor activity areas that include natural landscape and green spaces. For elementary and middle schools with structured recess, recommend play areas that include: hard surface areas for organized/ competitive sports; playground equipment; and green spaces for unstructured play and outdoor education curricula.</p>

- How would revisions to the *Guide* affect and/or increase access and the number of outdoor spaces designed to support or encourage physical activity?
- How would revisions to the *Guide* affect and/or increase the number of school spaces designed to support or encourage physical activity?

The proposed changes to the *Guide* would encourage schools to design indoor and outdoor spaces that can be used for a range of activities that are likely to appeal to the varied interests of a diverse student body and to better estimate the spaces needed to meet school and community demands for places to be physically active. These design elements and construction features can provide schools with

flexible spaces that are large enough to allow for movement and activity. However, the degree to which these spaces lead to changes in key health outcomes such as increased physical activity, improved classroom attentiveness, improved mental health, will vary depending on the degree to which policies, programs, and practices that encourage physical activity are supported by school administrators and implemented by teachers and school staff.

Based on information gathered through the literature review and assessment process, there is strong evidence that these types of changes would result in increased levels of physical activity if the enhanced indoor and outdoor spaces are used for physical activity by the school (Figure 26). Promising evidence suggests that improved classroom attentiveness, academic performance, and mental health outcomes could also result from these changes. More research is needed to determine whether these proposed changes could result in long-term reductions in student overweight and obesity.

ANTICIPATED CHANGES IN STUDENT HEALTH

Potential reach: *The proposed revision to the current guidance for classroom size has the potential to impact all students in a school as well as community residents.* Active classroom practices can be supported through classroom sizes that allow for student movement and school design features that allow teachers and students to quickly transition to and from movement breaks. In schools where all teachers are using active classroom practices, active classroom changes can benefit all students in a school. Younger students in elementary and middle schools may be more likely to be impacted by proposed revisions that would influence the construction and design of school grounds. While all students in younger grades are allocated time for recess and are therefore more likely to use playgrounds and other spaces for unstructured play, all secondary school students can potentially benefit from improvements to gymnasiums and ancillary spaces, although students involved in athletics or taking physical education classes may experience more direct benefits. Schools may need to consider ways to ensure that spaces for physical activity are made available for all students, not only students from more affluent households who, for example, may be more likely to afford athletic fees and have transportation access that makes it possible for them to participate in extracurricular athletic teams or clubs.

Magnitude of impact: *The degree to which students benefit from changes to the design of school spaces that create more opportunities for physical activity will vary, depending on the degree to which these new spaces are utilized.* In order for students to benefit from school classroom and school grounds decisions that encourage physical activity, teachers must have the training, support, and confidence to use these practices in their classrooms. While the suggested changes would create more opportunities for physical activity, the degree to which student health is impacted when school design guidelines accommodate classroom physical activity breaks and the use of less formal indoor and outdoor learning spaces may vary based on teacher characteristics.

Improved gymnasiums and ancillary spaces may allow schools to provide a wider range of physical activity options. According to the 2013 Minnesota Student Survey, only one-third (33%) of 9th grade girls are physically active at least 60 minutes, five or more days a week. In addition, high school students, particularly high school girls with lower rates of physical activity, are less likely to meet the recommended physical activity standards than younger students. High school students who are not

FIGURE 26: Summary of anticipated health impacts

		Red	Orange	Yellow	Green
		Evidence that negative changes in health may occur	More evidence is needed	A limited number of studies and/or data from local schools provides promising evidence of positive changes in health	Multiple studies provide strong evidence of positive changes in health
Anticipated change in health behavior/ health outcome	Brief description of evidence				
Increased physical activity	Among all grade levels, a variety of indoor and outdoor surfaces and options for play, active learning, and exercise are needed to create opportunities for physical activity among students with widely varying interests. A study of school playgrounds in Denver found that students' physical activity was higher at schools with remodeled playgrounds that included asphalt areas, soft play areas, and convening spaces with trees or built structures that provide shade than at schools with older playgrounds with only asphalt or gravel (Brink, et al., 2010). A number of studies demonstrate that movement breaks are effective in increasing physical activity among students (e.g., the number of steps taken by students), while reductions in body mass index (BMI) were observed in some, but not all, studies (Whitt-Glover, et al., 2013).				
Improved attention in the classroom and academic performance	Studies have demonstrated that students perform better on standardized tests, have better grades, and have better cognitive skills that support learning, such as concentration, attention, and behavior when students are physically active (Mahar, 2011; Robert Wood Johnson Foundation, 2011; Whitt-Glover, et al., 2013). More research is needed, however, as some studies have not found a connection between physical activity and changes in classroom behavior (Centers for Disease Control and Prevention, 2010).				
Improved mental health and wellness	Access to green space and time spent in nature are also associated with improved mental health, reduced stress, improved attention, and increased self-confidence (Bell & Dymont, 2008). These associations have been made for both adults and children, suggesting that the health benefits of green school grounds can extend to school staff and community residents. The availability of green space may be particularly helpful to enhance learning among students with attention deficit disorder (ADD). In a study of children with ADD, parents reported their children were more attentive and had fewer ADD symptoms after participating in activities in green settings (e.g., outdoor spaces with grass, plants, trees, etc.) compared to other types of settings (Faber-Taylor, Kuo & Sullivan, 2001).				
Reduced prevalence of childhood overweight and obesity	Although the proposed revisions are likely to result in increased levels of physical activity, relevant studies have not shown consistent reductions in body mass index (BMI) and rates of overweight/obesity (Active Living Research, 2013).				

involved in organized sports, and who may not be required to take physical education classes each year, may not benefit from improvements to traditional school athletic facilities such as ball fields. For students already involved in athletics programs, improved access to gym or pool space can minimize the number of evening and/or early morning team practices, potentially limiting the number of evening and early morning practices that might otherwise disrupt student sleep.

In this HIA, we focused primarily on ways that the proposed revisions the *Guide* would ultimately lead to changes in physical activity levels and long-term health benefits associated with improved fitness among students. However, when community use of school facilities is prioritized in the planning process, school designs can better allow for effective shared use agreements. Community residents can also benefit when shared use agreements are in place that allow them to take advantage of a school's indoor and outdoor spaces. When implemented, shared use agreements can lead to partnerships that increase opportunities for learning and physical activity among students and community residents, maximize financial investments made by developers and tax payers, increase social connectedness and neighborhood cohesion, and reduce emissions and energy use (Filardo, et al., 2010; Filardo and Vincent, 2014; Rowe, Stewart, & Patterson, 2007).

OTHER CONSIDERATIONS

Community residents, particularly those who live close to the school or who lack the financial resources to join other gyms or fitness centers, may also benefit from improvements to school grounds and athletic facilities if shared use agreements are in place. By considering all potential needs for athletic spaces and facilities by the school and the community, the final school design plan may be more likely to provide adequate space for use by community groups and individual residents. However, the project's interviews with school representatives highlighted the importance of schools taking student safety and school security measures into account when designing school spaces that will be used by community residents. This may include installation of cameras, having the capacity to restrict access to areas of the school used only for student learning, or directing all visitors to a single entrance near the administrative offices.

LOCAL EXAMPLES

One of the case study schools highlighted in this HIA offers examples of design changes it has implemented to encourage student physical activity throughout the school day.

- *Case Study School A* selected classroom furniture that could easily be moved into different configurations to accommodate different types of learning and classroom activity breaks. The school design includes wide hallways, a small outdoor courtyard, a school commons, and other designated spaces that can be used as physical activity breakout areas. Teachers and staff have received training on active classroom strategies, which are reinforced during weekly staff meetings where a movement break is incorporated into the agenda.

RECOMMENDATIONS FOR CHANGES TO THE *GUIDE TO INCREASE PHYSICAL ACTIVITY*

After reviewing the assessment results, the steering committee recommended that the proposed language introduced through the alternate scenarios be included in the revision of the *Guide, Section III*:

- **Athletic facilities:** Change square footage guidance to reflect capacity needs (e.g., 1 teaching station of 7,000 square feet per 500 students) for physical education instruction and physical activity during the school day.
 - » Also, consider separately the gymnasium space needs for athletic team practices, community recreation use, other afterschool activities, and/or opportunities for shared use agreements with community facilities that can leverage available spaces. (*Adapted from Maryland Public Schools' Physical Education Facilities Guidelines for New Construction and Major Renovations (2011); feedback and discussion with steering committee members.*)
- **Active classroom:** Recommend incorporating features that support active classroom practices into the design of indoor school spaces (e.g., selection of classroom furniture that can be easily moved to allow for physical activity breaks and active, configurable learning spaces; selection of flooring and acoustical materials that minimize wear and reduce noise from other classrooms or spaces that may distract student learning; and placing classrooms in close proximity to outdoor green spaces and other spaces, such as a commons area, that can be used for brief periods of physical activity).
- **Use of school grounds:** Recommend the design of outdoor activity areas that include natural landscape and green spaces. For elementary and middle schools with structured recess, recommend play areas that include: hard surface areas for organized/competitive sports; playground equipment; and green spaces for unstructured play and outdoor education curricula.

The steering committee identified several additional recommendations that would help ensure the revised *Guide* reflects current best practices and promising strategies to increase physical activity among students, staff, and others. These recommendations align with the assessment results and were informed by the review of the literature and discussions with content experts and steering committee members.

Planning School Construction Projects (Section II):

- Recommend that school districts assess school and community needs for spaces to be physically active as part of their ongoing strategic planning and assessment processes, and, when planning a specific construction project, identify this as a possible construction project issue to be addressed as part of a school facilities planning committee's assessment of school needs (*Parts 2.02 and 2.04*).
- Encourage school districts to prioritize construction projects where physical activity and physical education are impeded due to lack of space, inadequate facilities, scheduling conflicts, and transportation barriers that may contribute to imbalance in access, and where many students qualify for free or reduced-price lunch under the National School Lunch Program (NSLP) (*Parts 2.02 and 2.04*).

Designing School Facility Spaces (Sections III) and Relate Issues, Considerations (Section IV):

- Provide school districts with guidance for designing multi-purpose spaces that can be converted or adapted to enable a variety of types of physical education, physical activity (e.g., fitness, strength training, yoga, walking, running, volleyball, badminton, dance, or active recess), or other activities, and can be used by more than one class or group at a time (*Parts 3.05(l), 3.06(m), and 3.07(n)*).
- Provide specifications for secure storage of bicycle fleets and a bicycle repair/maintenance space (*Parts 3.05(l), 3.06(m), and 3.07(n)*).
- Provide specifications for field houses (*Parts 3.06(m) and 3.07(n)*).

Inclusive Decision-making: Recommendations

RATIONALE

The recommendations below propose changes to the *Guide* that address inclusive decision-making more specifically. The proposed changes support the *Guide's* central aim — to help school districts design healthy schools that foster academic success and physical and emotional well-being while also strengthening community partnerships, student and family involvement, and community cohesion.

Throughout the assessment step, steering committee members and other stakeholders noted that the decision-making process itself, specifically, who is involved and when they become involved, is important to address. In our discussions, inclusive decision-making was viewed as a mediating factor that, when done well, could help ensure that the perspectives of a broader range of community representatives is included and that health is considered early in the design phase when there are still meaningful opportunities to influence a school plan. Overall, while there was no clear way to quantify the likely impacts associated with changes in decision-making bodies or processes as part of the assessment step, a number of recommendations were developed to help ensure that health and health equity are taken into account.

RECOMMENDATIONS FOR CHANGES TO THE *GUIDE* TO PROMOTE INCLUSIVE DECISION-MAKING

The recommendations flow from the project's scoping and assessment steps, including review of the *Guide*, review of best practices and promising policy approaches, and discussions with the HIA steering committee and other experts. They suggest changes to the *Guide* which, if incorporated into the next revision, could help MDE and school construction stakeholders support the capacity of school districts to consider health impacts as an integral component of planning.

Introduction and Purpose of the *Guide*

The project's core team and steering committee reviewed the vision/purpose statement in the current edition of the *Guide* and discussed ways it might be modified, resulting in the following recommendation.

- Strengthen the statement of purpose of the *Guide* to explicitly adopt a Health in All Policies approach to school construction and siting planning and decision-making processes.

MDE Review and Comment (Section I, Part 1.04)

School districts are required to submit plans to MDE for [review and comment](#) only when planning new school construction and major renovation projects. Beginning FY 2015, review and comment by the commissioner is required only for projects with costs exceeding \$500,000 per site, if the school district has an outstanding capital loan, or \$2 million per site for all other districts unless projects are exempted. (Remodeling projects and projects involving maintenance of existing spaces funded by certain revenue sources are now exempted from review and comment.)

- Encourage school districts to publicize their plans to support pedestrian, bicycle and transit connections, maximize cooperative use and inter-governmental and non-profit collaborations, and consult with local or state transportation officials to address multimodal access and safety by posting this information on their websites, and to voluntarily include the following documentation in their review and comment letters to the commissioner of MDE:
 - » A description of the pedestrian, bicycle, and transit connections between the school and nearby residential areas that make it easier for children, teachers, and parents to get to the school by walking, bicycling, and taking public transit;
 - » A specification of how the project maximizes the opportunity for cooperative use of existing parks, recreational locations, and other public facilities, and whether and how the project will increase collaboration with other governmental or nonprofit entities; and
 - » A description of the consultation with local or state transportation officials on multimodal school site access and safety issues, and the ways that the project will address those issues.

Planning school construction projects (Section II)

- Encourage school districts to expand the scope of recommended participants in the planning process to include: parents, students, and community members; and individuals with expertise in public health, food and nutrition services, transportation planning, SRTS, regional planning, zoning and land use, physical activity/physical education, media services, school-based health/mental health/dental care, emergency preparedness, out-of-school time, and community education.
 - » Develop a list of agencies, organizations, etc., to contact when starting a project.
 - » Provide notice of meetings, forums, and all other opportunities to comment, targeted to sub-populations served.
 - » Address barriers to participation (e.g., transportation and/or time of day barriers).
 - » Provide translators for parents and other community members, as needed.
 - » Involve students in related learning opportunities (e.g., [Discover Design](#), a student design experience produced by the Chicago Architecture Foundation).
 - » Provide childcare for parents and community members, as needed.

- Identify and encourage opportunities for intergovernmental collaboration and information-sharing that:
 - » Support capacity-building of local public health departments, regional planners, state agencies, and others to assist with or support assessments of school facilities and grounds (e.g., provide training to community volunteers and others).
 - » Leverage resources (e.g., encourage use of incentives, public-private partnerships, public-public partnerships) to assist school districts with planning and implementation of design considerations.
- Encourage school districts to emphasize sustainable designs, transportation access, projected health impacts, and consultations and intergovernmental collaborations in 5- or 10-year facility plans submitted to MDE (where applicable) and in school wellness policies, by considering:
 - » Sustainable designs, integrating design policies, practices, and initiatives that support health and wellness but do not necessarily require new construction or major renovation.
 - » Transportation access, including pedestrian, bicycle, and public transit connections between the school and nearby residential areas, and connectivity to trails, parks, recreation centers, healthy food outlets, libraries, and health centers.
 - » Projected health benefits affecting students, staff, parents, and community members.
 - » Descriptions of current or planned consultations and intergovernmental collaborations that support health and wellness.
- Encourage school districts to establish site leadership teams at each school site, consisting of school staff, parents, students, and community members, to identify and monitor facility needs, recommend action plans, and provide annual reports to the school district and board.

LOCAL EXAMPLES

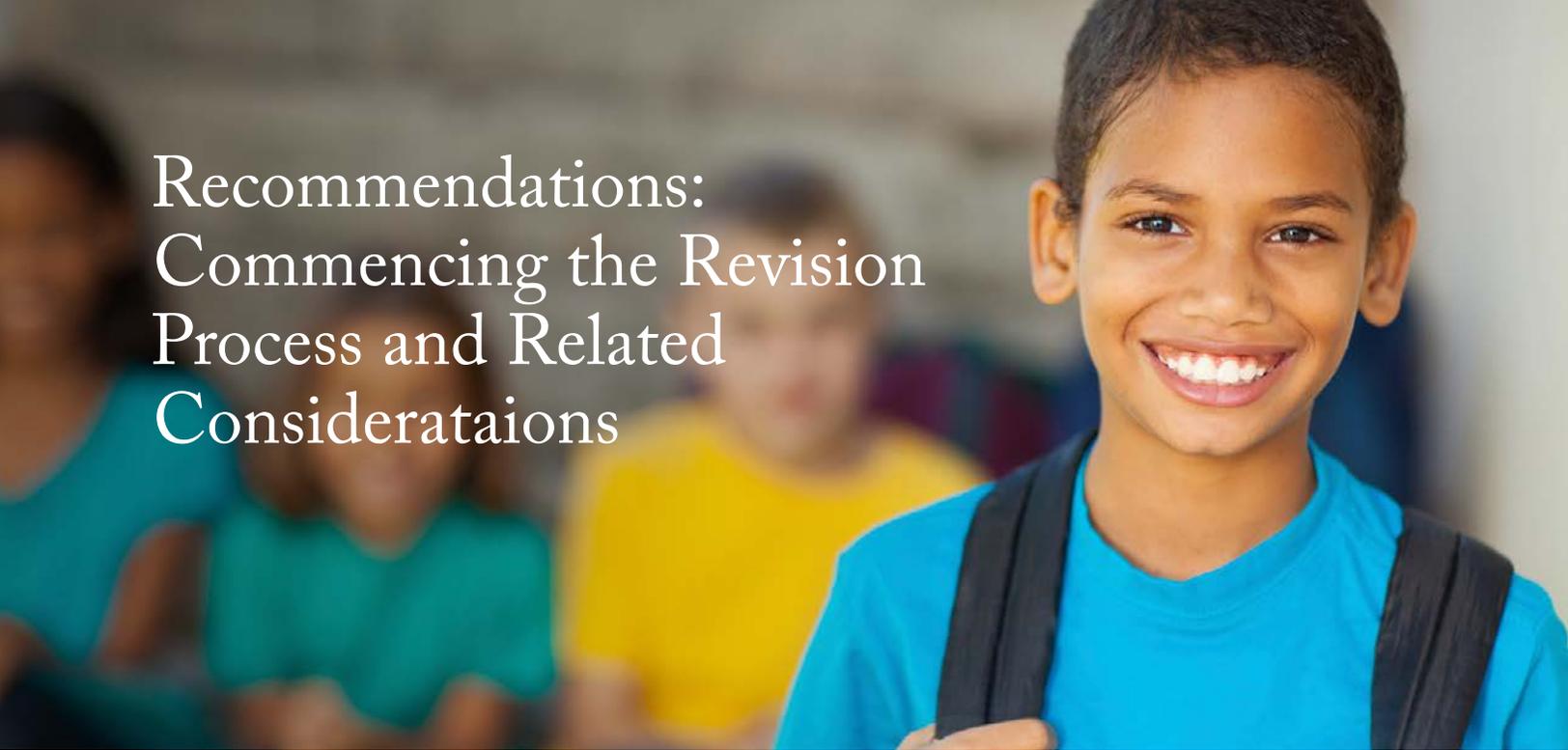
A focus group discussion held with parents to better understand the role they played in planning the renovation of *Case Study School A* highlighted a few key lessons learned from their experience:

- Parents had to fight for a new commons area, with one parent noting, “In the matrix for calculating square footage, there isn’t a place for hang-out space.” Other parents noted that schools with a commons area, or formal entrance, create a better, more positive environment that is more appealing to families who are considering moving into the area, potentially strengthening community vitality. In addition to serving as a new multi-purpose space, the commons area signifies the high quality education that occurs in the classrooms.
- The renovated school has added 9–10 small break-out rooms which are heavily used by students, staff, and social workers. These rooms are more comfortable, convenient, and private than previously used locations, which included huddling beneath staircases.

- A positive relationship between the community and the architect was critical to the school's success. Parents felt the architect spoke on behalf of the parents. This relationship was developed through the inclusion of a parental steering committee that stayed engaged throughout the design and construction processes. Parents noted that this isn't always the case with other schools, where some architects engage parents only in initial "vision" focus group meetings. Despite this positive relationship with the architect, miscommunication with the contractor resulted in the renovation running over-budget, threatening the completion, as designed.
- Much of the design of the school can be attributed to thinking more holistically about the role the school plays in its community. This includes designing the gymnasium to serve the community, working with the local parks department and the neighborhood association, and considering how the image of the school reflects that of the community.

After multiple failed referendums, *Case Study School B* finally got the school they wanted. In a focus group conducted with several parents who are also teachers or administrators at the school, we learned about the journey and the impact it has had on the school and the community.

- After each failed referendum, parents and community members renewed their resolve and commitment to build a new school that would benefit the entire community. Their involvement throughout the process ensured that the design was responsive to school and community stakeholders, even if many of the design details had to wait until funding was secured. Focus group participants cited one-on-one discussions between parents, tours of the decrepit old building, and the involvement of grandparents, students, and recent alumni as key factors in gaining support. With the help of additional federal funding, the referendum finally passed on the sixth vote. All of the focus group participants felt strongly that this process, while emotionally trying and difficult, brought the community together, led the design of a better school, and provided a valuable learning experience and civic lesson for the students, who clearly take pride in the new school.
- The new cafeteria serves healthier food from local sources and offers more choices, leading to an 88 percent participation rate in the school lunch program, despite an open campus policy. This is noted as a direct result of increased storage and improved kitchen equipment and facilities compared to the old school.
- When asked about the impacts of the new design features, nearly every focus group participant noted improvements — better lab spaces have contributed to improved biology grades and behavior; special education spaces are better tailored to student needs; access to technology has improved; students are using the physical activity spaces more frequently; students and staff are experiencing fewer sinus infections and migraines due to improved air quality; and classrooms now offer more comfortable learning environments.



Recommendations: Commencing the Revision Process and Related Considerations

In addition to recommendations that propose changes to the content of the *Guide*, the HIA core team and steering committee make the following recommendations, which support stakeholder interest in revising the *Guide*, keeping it updated, building the evidence base, and communicating sound and visionary guidance. Some of these recommendations refer to current sections of the *Guide*, including *Section I, State of Minnesota and School District Responsibilities*. Except as otherwise noted, the following recommendations apply to MDE.

Secure Resources for Revising the *Guide* and Schedule the Revision Process

- Enable MDE, in collaboration with other state agencies (MDH, MPCA, MnDOT, MDA, and others), to revise the *Guide* in 2015–16 and every ten years thereafter.
 - » Request funds from the Minnesota legislature to revise the *Guide* in 2015–16 and every ten years thereafter.
 - » Establish criteria to assess and revise the *Guide*'s content and evaluate its use.
 - » Establish a standing advisory panel/committee on school construction and siting.
 - » Establish an ongoing mechanism to make interim updates (e.g., annual or biennial).

Expand Stakeholder Participation in Revising the *Guide*

- In addition to past stakeholder representatives, strive to include students, parents, and community members and experts in: health equity and public health; food and nutrition services; transportation planning, including SRTS; regional planning, zoning and land use; physical activity and physical education; school-based health, mental health, and dental care; emergency preparedness; out-of-school (OST) time; and community education.

- » Address barriers to participation (e.g., transportation and/or time of day barriers).
- » Provide translators, as needed.
- » Provide opportunities for public review and comment.
- » Refine MDE’s communications strategy to optimize familiarity with the *Guide* and encourage its use. Create a robust presence for the *Guide* on the MDE website to provide school districts and other stakeholders with easy access to the *Guide*, including active links to resources (e.g., national guidelines, standards, and best practices publications).

Support School Finance Reform (*Section I, Parts 1.02 and 1.03*)

MDE recently reported to the Minnesota Legislature about fair access to funding mechanisms for school construction projects and related grant programs. This recommendation encourages MDE to:

- Publicize the [2014 School Facilities Financing Working Group Report and Recommendations to the Minnesota Legislature](#) to educate the public about its contents. The report urges: 1) consolidation funding and equalization of all school facilities tax levies, including the capital projects referendum levy, to ensure that all districts have equitable access to revenue regardless of their local tax base; and, 2) prioritization of grant programs that support student health outcomes in communities with greatest needs.

Add Content to the MDE Report Card

- Consider including additional information on the MDE school report card to reinforce opportunities for students to engage in daily physical activity and to identify gaps and disparities in access to services. For example:
 - » Health and wellness metrics (e.g., chronic absenteeism, results of fitness tests)
 - » Amount of daily physical activity in before- and after-school programs
 - » Availability of active transportation
 - » Availability of public transportation
 - » Availability of community access to school grounds and facilities
 - » A written physical activity plan for the school facility and grounds

Inventory Minnesota K–12 Public Schools and Create a Database (*Section I, Part 1.01*)

- Conduct a one-time inventory of Minnesota K–12 schools (i.e., assess conditions of all facilities) and create a school facility database. Prioritize data collection by conducting inventories of schools with the greatest needs first. For example:

- » Inventory all schools built prior to a certain year (e.g., 1974)
- » Inventory all schools where at least one-third of students are eligible for free or reduced-price lunch (i.e., high poverty schools)
- » Inventory all schools serving at least one-third students of color
- » Inventory all high schools with low graduation rates
- Include in each inventory an assessment of site deficiencies related to SRTS, physical activity, physical education, and the food environment. “A design deficiency exists when a building, regardless of its condition, is unable to meet the best practice standards of the state or school district” (National Forum on Education Statistics, 2012).

Monitor and Evaluate Implementation of Best Practices Recommended in the *Guide*

- To gauge outcomes, MDE should encourage school districts, working in partnership with local and state evaluation experts, to monitor and evaluate the implementation of best practices recommended in the *Guide*, as suggested in the following examples:
 - » Conduct a post-occupancy evaluation to document whether construction or renovation decisions are meeting a school’s needs.
 - » Track changes in health metrics that may be due in part to new construction or renovation.
 - » Track and evaluate changes in school food environments (e.g., kitchen/cafeteria, garden).
 - » Track student and community use of shared or co-located facilities.
 - » Evaluate community members’ and school administrators’ satisfaction with shared use of spaces and/or co-located facilities.
 - » Evaluate cost savings, in-kind support, increases in revenue, and/or other financial impacts of shared-use agreements or co-located facilities.
 - » Evaluate changes in community cohesion.
 - » Evaluate whether walkability/bikeability assessments have improved infrastructure changes to better meet student and community needs.
 - » Track student walking/biking to school, annually.
- Encourage research to assess the extent to which physical condition of facilities and/or grounds impede schools from providing quality physical education daily and ensuring that school children are physically active during each school day.

Monitoring and Evaluation



Monitoring and evaluation is the last of the six steps used to complete an HIA. The goal of this step, as it relates to this HIA, is to assess how well the project has been implemented (process evaluation), the degree to which it has impacted decision-making and informed discussion around school siting and construction issues (impact evaluation), and the degree to which health outcomes have changed as a result of schools incorporating HIA recommendations into their design and construction plans (outcome evaluation).

Only the process evaluation components were conducted before conclusion of the HIA. The impact and outcome evaluation components fall outside the scope and timing of this project but will be shared with MDE and MDH. Responsibility for monitoring and evaluating the impact and outcomes associated with the HIA could fall within the scope of work undertaken by the staff of one or both of these state agencies, given their respective roles related to the topics addressed.

The Public Health Law Center plans to monitor the impact of the HIA report and recommendations on the outcome of the next revision of the *Guide* as well as any legislation that may be proposed and/or enacted to support future revisions. In addition, we will track requests for copies of the report or other additional information, requests for presentations, citations to the report and/or news reports that mention the HIA, the number of presentations given and, if possible, the number of report downloads and knowledge of any other states that incorporate some of the HIA recommendations.

References

- American Society of Civil Engineers (2014). *2013 Report Card for America's Infrastructure*. Retrieved from <http://www.infrastructurereportcard.org>
- Anthamatten, P., Brink, L., Kingston, B., Kutchman, E., Lampe, S. & Nigg, C. (2014). An assessment of schoolyard features and behavior patterns in children's utilization and physical activity. *Journal of Physical Activity & Health, 11*(3), 564-573.
- Babio, N., Vicent, P., López, L., Benito, A., Basulto, J., & Salas-Salvadó, J. (2014). Adolescents' ability to select healthy food using two different front-of-pack food labels: a cross-over study. *Public Health Nutrition, 17*(06), 1403-1409.
- Baker, J.L., Olsen, L.W. & Sorensen, T.I. (2007). Childhood body mass index and the risk of coronary heart disease in adulthood. *New England Journal of Medicine, 357*, 2329-2337.
- Basch, C.E. (2010). Healthier students are better learners: A missing link in school reforms to close the achievement gap. *Equity Matters: Research Review 6*. Retrieved from http://www.equitycampaign.org/i/a/document/12557_EquityMattersVol6_Web03082010.pdf.
- Bell, A.C. & Dymont, J.E. (2008). Grounds for health: The intersection of green school grounds and health-promoting schools. *Environmental Education Research, 14* (1), 77-90.
- Belot, M. & James, J. (2011). Healthy school meals and educational outcomes. *Journal of Health Economics, 30*(3), 489-504.
- Bradley, B.J. & Greene, A.C. (2013). Do health and education agencies in the United States share responsibility for academic achievement and health? A review of 25 years of evidence about the relationship of adolescents' academic achievement and health behaviors. *Journal of Adolescent Health, 52*, 523-532.
- Brink, L. A., Nigg, C. R., Lampe, S. M. R., Kingston, B. A., Mootz, A. L., & Vliet, W. van. (2010). Influence of Schoolyard Renovations on Children's Physical Activity: The Learning Landscapes Program. *American Journal of Public Health, 100*(9), 1672-1678.
- Buckley, A., Lowry, M.B., Brown, H., & Barton, B. (2013). Evaluating Safe Routes to School events that designate days for walking and bicycling. *Transport Policy, 30*, 294-300.
- Button, B., Trites, S. & Janssen, I. (2013). Relations between the school physical environment and school social capital with student physical activity levels. *BMC Public Health, 13*, 1191.
- Carlson, J.A., Mignano, A.M., Norman, G.J., McKenzie, T.L., Kerr, J., Arredondo, E.M., Madanat, H., Cain, K.L., Elder, J.P., Saelens, B.E. & Sallis, J.F. (2013). Socioeconomic disparities in elementary school practices and children's physical activity during school. *American Journal of Health Promotion, 28*(3 Suppl), S47-53.

- Carlson, J.A., Sallis, J.F. & The California Endowment. (2013). Best school practices for supporting physical activity: Research report. Retrieved from http://sallis.ucsd.edu/Documents/Pubs_documents/TCE%20&%20UCSD%20school%20PA%20practices%20report%20FD.pdf.
- Center for Ecoliteracy. (2010). Rethinking school lunch guide: Second edition. Retrieved from <http://www.ecoliteracy.org/downloads/rethinking-school-lunch-guide>.
- Centers for Disease Control and Prevention (2014). Childhood obesity facts. Retrieved from <http://www.cdc.gov/healthyyouth/obesity/facts.htm>.
- Centers for Disease Control and Prevention (2014a). Health and academic achievement. Retrieved from http://www.cdc.gov/healthyyouth/health_and_academics/pdf/health-academic-achievement.pdf.
- Centers for Disease Control and Prevention. (2013). State indicator report on fruits and vegetables. Retrieved from <http://www.cdc.gov/nutrition/downloads/state-indicator-report-fruits-vegetables-2013.pdf>.
- Centers for Disease Control and Prevention. 2013. Nutrition, Physical Activity, and Obesity — Prevention Status Reports (PSR). Retrieved from <http://www.cdc.gov/stltpublichealth/psr/npao/index.html>
- Centers for Disease Control and Prevention (2014). Prevention status reports 2013: Nutrition, physical activity and nutrition — Minnesota. Atlanta, GA: US Department of Health and Human Services. Retrieved from <http://www.cdc.gov/psr/npao/2013/MN-npao.pdf>
- Centers for Disease Control and Prevention. (2012). *School Health Profiles: Characteristics of health programs among secondary schools*. Retrieved from http://www.cdc.gov/healthyyouth/profiles/2012/profiles_report.pdf.
- Centers for Disease Control and Prevention. (2011). School health guidelines to promote healthy eating and physical activity. *MMWR 2011: 60* (5). Retrieved from <http://www.cdc.gov/mmwr/pdf/rr/rr6005.pdf>.
- Centers for Disease Control and Prevention. (2010). The association between school based physical activity, including physical education, and academic performance. Atlanta, GA: U.S. Department of Health and Human Services. Retrieved from http://www.cdc.gov/healthyyouth/health_and_academics/pdf/pape_executive_summary.pdf.
- ChangeLab Solutions. (2012). Smart school siting: How healthier school locations can make students healthier and communities stronger. Retrieved from http://changelabsolutions.org/sites/default/files/Smart_School_Siting_FactSheet_FINAL_%28CLS-20120530%29_20120312_0.pdf.
- City of New York. (2010). Active design guidelines: Promoting physical activity and health in design. Retrieved from <http://centerforactivedesign.org/dl/guidelines.pdf>.
- Chillón, P., Evenson, K.R., Vaughn, A., & Ward, D.S. (2011). A systematic review of interventions for promoting active transportation to school. *International Journal of Behavioral Nutrition and Physical Activity*, 8 (10). Retrieved from www.ijbnpa.org.

- Cooper, A.R., Andersen, L.B., Wedderkopp, N. Page, A.S. & Froberg, K. (2005). Physical activity levels of children who walk, cycle, or are driven to school. *American Journal of Preventive Medicine*, 29(3), 179-183.
- Cutler, C. & Lleras-Muney, A. (2006). *Education and health: Evaluating theories and evidence*. National Poverty Center, Gerald R. Ford School of Public Policy, University of Michigan. Retrieved from http://npc.umich.edu/publications/policy_briefs/brief9.
- Deshmukh-Taskar, P., Nicklas, T.A., Morales, M., Yang S.G., Zakeri, I., & Berenson, G.S. (2006). Tracking of overweight status from childhood to young adulthood: the Bogalusa Heart Study. *European Journal of Clinical Nutrition*, 60, 48-57.
- Dietary Guidelines Advisory Committee. (2010). Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2010, to the Secretary of Agriculture and the Secretary of Health and Human Services. U.S. Department of Agriculture, Agricultural Research Service, Washington D.C. Retrieved from http://www.cnp.usda.gov/sites/default/files/dietary_guidelines_for_americans/2010DGACReport-camera-ready-Jan11-11.pdf.
- Dimaggio, C. & Li, G. (2013). Effectiveness of a Safe Routes to School program in preventing school-aged pedestrian injury. *Pediatrics*, 131(2), 290-296.
- DiPaola, M.F. & Tschannen-Moran, M. (2005). Bridging or buffering: The impact of schools' adaptive strategies on student achievement. *The Journal of Educational Administration*, 43(1), 60-71.
- Egerter, S., Braverman, P., Pamuk, E., Cubbin, C., Dekker, M., Pedregon, V. & Sadegh-Nobari, T. (2008). *America's health starts with healthy children: How do states compare?* Robert Wood Johnson Foundation Commission to Build a Healthier America: Washington, DC. Retrieved from <http://www.commissiononhealth.org/PDF/819a3435-8bbb-4549-94db-7758248075cf/ChildrensHealthChartbook.pdf>.
- European Centre for Health Policy (1999). *Health Impact Assessment: main concepts and suggested approach, Gothenburg consensus paper*. Retrieved from <http://www.apfo.org.uk/resource/item.aspx?RID=44163>.
- Ewing, R., Schroeder, W., & Greene, W. (2004). School location and student travel analysis of factors affecting mode choice. *Transportation Research Record: Journal of the Transportation Research Board*, 1895 (1), 55-63.
- Faulkner, G.E.J., Buliung, R.N., Flora, P.K. & Fusco, C. (2009). Active school transport, physical activity levels and body weight of children and youth: A systematic review. *Preventive Medicine*, 48(1), 3-8.
- Faber Taylor, A., Kuo, F.E., & Sullivan, W.C. (2001). Coping with ADD: The surprising connection to green play settings. *Environment and Behavior*, 33(1), 54-77.
- Filardo, M., Vincent, J.M., Marni, A., & Franklin, J. (2010). Joint use of public schools: A framework for a new social contract. *Center for Cities and Schools*. University of California, Berkeley: Center for Cities and Schools. Retrieved from <https://escholarship.org/uc/item/44m449tp>.

- Freedman, D.S., Kettel, L., Serdula, M.K., Dietz, W.H., Srinivasan, S.R., & Berenson, G.S. (2005). The relation of childhood BMI to adult adiposity: The Bogalusa Heart Study. *Pediatrics*, *115*, 22-27.
- Fuller, B., Dauter, L., Hosek, A., Kirschenbaum, G., McKoy, D., Rigby, J., & Vincent, J. M. (2009). Building Schools, Rethinking Quality? Early Lessons from Los Angeles. *Journal of Educational Administration*, *47*(3), 336-349.
- Gibson, C.A., Harvey, S. P., Spaeth, K., Sullivan, D.K., Lambourne, K., & Kunkel, G.H. (2014). Farm to school, school to home: An evaluation of a farm to school program at an urban core Head Start preschool program. *Journal of Hunger and Environmental Nutrition*, *9* (3), 334-349.
- Gillen-O'Neel, C., Huynh, V.W. and Fuligni, A.J. (2013). To study or to sleep? The academic costs of extra studying at the expense of sleep. *Child Development*, *84*(1), 133-142.
- Golley, R., Baines, E., Basset, P, Wood L., Pearce, J., & Nelson, M. (2010). School lunch and learning behavior in primary schools: An intervention study. *European Journal of Clinical Nutrition*, *64* (11): 1280-1288.
- Guo, S.S. & Chumlea, W.C. (1999). Tracking of body mass index in children in relation to overweight in adulthood. *American Journal of Clinical Nutrition*, *70*, S145-148.
- Hanks, A.S., Just, D.R., Smith, L.E., & Wansink, B. (2012). Health convenience: Nudging students toward healthier choices in the lunchroom. *Journal of Public Health*, *34*(3), 371-376.
- Hanks, A. S., Just, D. R., & Wansink, B. (2013). Smarter lunchrooms can address new school lunchroom guidelines and childhood obesity. *Journal of Pediatrics*, *162*(4), 867-869.
- Hallal, P.C., Victoria, C.G., Azevedo, M.R., & Wells, J.C. (2006). Adolescent physical activity and health: A systematic review. *Sports Medicine*, *36* (12), 1019-1030.
- Heelan, K.A., Abbey, B.M., Donnelly, J.E., Mayo, E.S., & Welk, G.J. (2009). Evaluation of a walking school bus for promoting physical activity in youth. *Journal of Physical Activity & Health*, *6*(5), 560-567.
- Hinman, K. (2011). The School Lunch Wars. *The Wilson Quarterly*. Retrieved from <http://archive.wilsonquarterly.com/essays/school-lunch-wars>.
- Huang, T. T-K., Sorensen, D., Davis, S., Frerichs, L., Brittin, J., Celentano, J., Callahan, K., & Trowbridge, M.J. (2013). Healthy eating design guidelines for school architecture. *Preventing Chronic Disease*, (10). Retrieved from http://www.cdc.gov/pcd/issues/2013/12_0084.htm.
- Ickovics, J.R., Carroll-Scott, A., Peters, S.M., Schwartz, M., Gilstad-Hayden, K, & McCaslin, C. (2014). Health and academic achievement: Cumulative effects of health assets on standardized test scores among urban youth in the United States. *Journal of School Health*, *84*(1), 40-48.
- Izumi, B. T., Alaimo, K., & Hamm, M. W. (2010). Farm-to-School Programs: Perspectives of school food service professionals. *Journal of Nutrition Education and Behavior*, *42*(2), 83-91.

- Just, D.R. & Wansink, B. (2009). Smarter lunchrooms: Using behavioral economics to improve meal selection. *Choices* 24(3). Retrieved from <http://www.choicesmagazine.org/magazine/article.php?article=87>.
- Lawrence, B.K. (2003). Land for granted: The effects of acreage policies on rural schools and communities. *The Rural School and Community Trust*. Retrieved from http://www.ruraledu.org/user_uploads/file/Land_for_Granted.pdf.
- Lee, M.C., Orenstein, M.R. & Richardson, M.J. (2008). Systematic review of active commuting to school and children's physical activity and weight. *Journal of Physical Activity and Health*, 5(6), 930-949.
- Lees, C. & Hopkins, J. (2013). Effect of aerobic exercise on cognition, academic achievement, and psychosocial function in children: A systematic review of randomized control trials. *Preventing Chronic Disease*, 10. Retrieved from http://www.cdc.gov/pcd/issues/2013/13_0010.htm.
- Lubans, D.R., Plotnikoff, R.C. & Lubans, N.J. (2012). A systematic review of the impact of physical activity programmes on social and emotional well-being in at-risk youth. *Child and Adolescent Mental Health*, 17(1), 2-13.
- Maller, C., Townsend, M., Pryor, A., Brown, P., & St. Leger, L. (2006). Healthy nature healthy people: 'contact with nature' as an upstream health promotion for populations. *Health Promotion International*, 21 (1), 45-54.
- Mahar, M. T. (2011). Impact of short bouts of physical activity on attention-to-task in elementary school children. *Preventive Medicine*, 52 (Suppl 1), S60-64.
- Maxwell, L.A. (March 3, 2014). Minneapolis leader turns school cafeterias into 'real kitchens.' *Education Weekly*. Retrieved from <http://www.edweek.org/ew/articles/2014/03/05/231tlf-weber.h33.html>.
- Maynard, M., Gunnell, D., Ness, A.R., Abraham, L., Bates, C.J., & Blane, D. (2006). What influences diet in early old age? Prospective and cross-sectional analyses of the Boyd Orr cohort. *European Journal of Public Health*, 16, 316-324.
- McCann, B.A. and Ewing, R. (2003). Sprawl: A national analysis of physical activity, obesity, and chronic disease. *Smart Growth America: Surface Transportation Policy Project*. Retrieved from <http://www.smartgrowthamerica.org/documents/HealthSprawl8.03-1.pdf>.
- McDonald, N.C. (2010). School siting. *Journal of the American Planning Association*, 76(2), 184-198.
- McDonald, N.C., Brown, A.L., Marchetti, L.M. & Pedroso, M.S. (2011). U.S. school travel, 2009: An assessment of trends. *American Journal of Preventive Medicine*, 41(2), 146-151.
- McDonald, N.C., Yang, Y., Abbott, S.M. & Bullock, A.N. (2013). Impact of a Safe Routes to School program on walking and biking: Eugene, Oregon study. *Transport Policy*, 29, 243-248.
- McDonald, N.C., Salvesen, D.A., Kuhlman, H. R., & Combs, T.S. (2014). The impact of changes in state minimum acreage policies on school siting practices. *Journal of Planning Education and Research*, 34(2), 169-179.

- McDonald, N.C., Steiner, R.L., Lee, C., Smith, T.R., Zhu, X. & Yang, Y. (2014). The impact of Safe Routes to School program on walking and bicycling. *Journal of the American Planning Association*, 80 (2), 153-167.
- Mendoza, J.A., Watson, K., Baranowski, T., Nicklas, T.A., Uscanga, D.K., & Hanfling, M.J. (2011). The walking school bus and children's physical activity: A pilot cluster randomized control trial. *Pediatrics*, 128 (3), e537-e544.
- Minnesota Department of Agriculture (MDA). (n.d.). Information confirmed by MDA staff member, Ashley Bress, Farm to School Program Administrator, via telephone communication, December 30, 2014.
- Minnesota Department of Education (n.d.). *Minnesota Report Card, 2012-13 school year*. Retrieved from <http://rc.education.state.mn.us>.
- Minnesota Department of Health. (2014). *Advancing health equity in Minnesota: A report to the legislature*. Retrieved from http://www.health.state.mn.us/divs/chs/healthequity/ahe_leg_report_020414.pdf.
- Minnesota Department of Transportation (MnDOT). (2014). Safe Routes to Schools parent survey, 2007-2014 [Data file]. (St. Paul, MN: MnDOT).
- Minnesota Food Charter. (n.d.). *Minnesota Food Charter Schools Leader Guide*. Retrieved from http://mnfoodcharter.com/wp-content/uploads/2014/10/MFC_SchoolsLeaderGuide_D10_FINAL.pdf.
- National Center for Safe Routes to School. (2011). Shifting modes: A comparative analysis of Safe Routes to School program elements and travel mode outcomes. Retrieved from <http://www.saferoutesinfo.org/program-tools/shifting-modes-report>.
- National Center for Safe Routes to School (n.d.) *What distances are reasonable to expect elementary school students to bike to school?* Retrieved from <http://www.saferoutesinfo.org/program-tools/what-distances-are-reasonable-expect-elementary-school-students-bike-school>.
- National Forum on Education Statistics. (2012). Forum Guide to Facilities Information Management: A Resource for State and Local Education Agencies. (NFES 2012-808), 24, Washington, DC: National Center for Education Statistics, U.S. Department of Education. Retrieved from <http://nces.ed.gov/pubs2012/2012808.pdf>.
- Orenstein, M.R., Gutierrez, N., Rice, T.M., Cooper, J.F., & Ragland, D.R. (2007). *Safe Routes to School: Safety and mobility analysis. Report to the California legislature*. Retrieved from <http://escholarship.org/uc/item/5455454c#page-2>.
- Owens, J.A. (2014). Insufficient sleep in adolescents and young adults: An update on causes and consequences. *Pediatrics*, 134(3), e921-932.
- Owens, J.A., Belon, K. & Moss, P. (2010). Impact of delaying school start time on adolescent sleep, mood, and behavior. *Archives of Pediatric & Adolescent Medicine*, 164(7), 608-614.

- Pan, L., Sherry, B., Park, S., & Blanck, H.M. (2013). The association of obesity and school absenteeism attributed to illness or injury among adolescents in the United States, 2009. *Journal of Adolescent Health, 52*(1), 64-69.
- Perry, C.L., Bishop, D.B., Taylor, G.L., Davis, M., Story, M., Gray, C., Bishop, S.C., Mays, R.A., Lytle, L.A., & Harnack, L. (2004). A randomized school trial of environmental strategies to encourage fruit and vegetable consumption among children. *Health Education & Behavior, 31* (1), 65-76.
- Potwarka, L.R., Kaczynski, A.T. & Flack, A.L. (2008). Places to play: Association of park space and facilities with healthy weight status among children. *Journal of Community Health, 33*(5), 344-350.
- Raspberry, C.N., Lee, S.M., Robin, L., Laris, B.A., Russell, L.A., Coyle, K.K., & Nihiser, A.J. (2011). The association between school-based physical activity, including physical education, and academic performance: A systematic review of the literature. *Preventive Medicine, 52*(Suppl 1), S10-20.
- Retting, R.A., Ferguson, S.A., & McCartt, A.T. (2003). A review of evidence-based traffic engineering measure designed to reduce pedestrian-motor vehicle crashes. *American Journal of Public Health, 93*(9): 1456-1463.
- Ritchie, S.M. & Chen, W-T. (2011). Farm to school: A selected and annotated bibliography. Special Reference Briefs Series no. 2011-02. Beltsville, MD: U.S. Department of Agriculture, Agricultural Research Service, National Agricultural Library & Johns Hopkins Center for a Livable Future. Retrieved from <http://www.nal.usda.gov/afsic/pubs/srb1102.pdf>.
- Robert Wood Johnson Foundation. (2011). Making the connection: Linking academic achievement to policies to promote physical activity. Retrieved from <http://www.leadershipforhealthycommunities.org/resources-mainmenu-40/making-the-connection-policy-briefs/702-making-the-connection-linking-academic-achievement-to-policies-to-promote-physical-activity>.
- Rothman, L., To, T., Buliung, R., Macarthur, C. & Howard, A. (2014). Influence of social and built environment features on children walking to school: An observational study. *Preventive Medicine, 60*, 10-15.
- Rowe, F., Steward, D., & Patterson, C. (2007). Promoting school connectedness through whole school approaches. *Health Education, 107*(6), 524-542.
- Saelens, B.E., Sallis, J.F., Frank, L.D., Couch, S.C., Zhou, C., Colburn, T., Cain, K.L., Chapman, J. & Glanz, K. (2012). Obesogenic neighborhood environments, child and parent obesity. *American Journal of Preventive Medicine, 42*(5), e57-e64.
- Schlossberg, M., Phillips, P. P., Johnson, B. & Parker, B. (2005). How did they get there? A spatial analysis of a 'sprawl school' in Oregon. *Planning, Practice & Research, 20*(2), 147-162.
- Singh, A., Uijtdewilligen, L., Twisk, J., van Mechlen, W., & Chinapaw, M.J.M. (2012). Physical activity and performance at school: A systematic review of the literature including a methodological quality assessment. *Archives of Pediatric & Adolescent Medicine, 166*(1), 49-55.

- Slusser, W.M., Cumberland, W.G., Browdy, B.L., Lange, L., & Neumann, C. (2007). A school salad bar increases frequency of fruit and vegetable consumption among children living in low-income households. *Public Health Nutrition*, 10(12), 1490-1496.
- Stakeholder Participation Working Group of the 2010 HIA of the Americas Workshop. (2012). Guidelines & Best Practices for Stakeholder Participation in Health Impact Assessments. Retrieved from <http://www.pewtrusts.org/en/projects/health-impact-project/research-and-analysis/toolkits-guides-and-data-sources>.
- Strickland, M.F., Darrow, L.A., Klien, M., Flanders, W.D., Sarnat, J.A., Waller, L.A., Sarnat, S.E., Mulholland, J.A. & Tolbert, P.E. (2010). Short-term associations between ambient air pollutants and pediatric asthma emergency department visits. *American Journal of Respiratory Critical Care*, 182(3), 307-316.
- Story, M., Neumark-Sztainer, D., & French, S. (2002). Individual and environmental influences on adolescent eating behaviors. *Journal of the American Dietetic Association*, 102(3), S40-S51.
- Tanner, C.K. (2009). Effects of school design on student outcomes. *Journal of Educational Administration*, 47(3), 381-399.
- Telama, R. (2009). Tracking of physical activity from childhood to adulthood: A review. *Obesity Facts*, 3, 187-195.
- Telama, R., Yang, X., Leskinen, E., Kankaanpaa, A., Hirvensalo, M., Tammelin, T., Viikara, J.S., & Raitakari O.T. (2014). Tracking of physical activity from early childhood through youth into adulthood. *Medicine and Science in Sports and Exercise*, 46(5), 955-962.
- Telama, R., Yang, X., Viikari, J., Valimaki, I., Wanne O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: A 21-year tracking study. *American Journal of Preventive Medicine*, 28(3), 267-273.
- The Pew Charitable Trusts, Robert Wood Johnson Foundation. (2014, March). *Serving healthy school meals: Minnesota schools need updated equipment and infrastructure* [Issue brief]. Retrieved from http://www.pewtrusts.org/~media/legacy/uploadedfiles/phg/content_level_pages/other_resource/KSHFKITSMinnesotapdf.pdf.
- Thorndike, A. N., Riis, J., Sonnenberg, L. M., & Levy, D. E. (2014). Traffic-light labels and choice architecture: Promoting healthy food choices. *American Journal of Preventive Medicine*, 46(2), 143-149.
- Tirosh, A., Shair, I., Arnon, A., Dubnov-Raz, G., Ayalon, N., Gordon, B., Derazne, E., Tzur, D., Shamis, A., Vinker, S., & Rudich, A. (2011). Adolescent BMI trajectory and risk of diabetes versus coronary disease. *New England Journal of Medicine*, 364, 1315-1325.
- Trost, S. (2009). Active education: Physical education, physical activity, and academic performance. Active Living Research. Retrieved from www.activelivingresearch.org/active-education-physical-education-physical-activity-and-academic-performance.
- Uline, C., & Tschannen-Moran, M. (2008). The walks speak: the interplay of quality facilities, school climate, and student achievement. *Journal of Educational Administration*, 46 (1), 55, 73.

- Uline, C.L., Wolsey, T.D., Tschannen-Moran, M., & Lin, C. (2010). Improving the physical and social environment of school: A question of equity. *Journal of School Leadership*, 20(5), 597-632.
- United States Department of Health and Human Services (DHHS). (2008). *Physical Activity Guidelines for Americans*. Washington, DC: U.S. Department of Health and Human Services. Retrieved from <http://www.health.gov/paguidelines>.
- United States Environmental Protection Agency (U.S. EPA). (2003). *Travel and environmental implications of school siting*. Retrieved from http://www.epa.gov/smartgrowth/pdf/school_travel.pdf.
- United States Environmental Protection Agency (U.S. EPA). (2008). *Youth Travel to School: Community Design Relationships with Mode Choice, Vehicle Emissions, and Healthy Body Weight*. Retrieved from http://www.epa.gov/smartgrowth/youth_travel.htm.
- United States Environmental Protection Agency (U.S. EPA). (2011). *School Siting Guidelines*. Retrieved from <http://www.epa.gov/schools/guidelinestools/siting>.
- Wansink, B., Just, D. R., & McKendry, J. (2010, October 21). Lunch Line Redesign. *The New York Times*.
- Wansink, B., Just, D.R., Patterson, R.W. & Smith, L.E. (2013). Nutrition report cards: An opportunity to improve school lunch selection. *PLoS ONE*, 8(11). Retrieved from <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0072008>.
- Weigand, L. (2008). A review of the literature: The effectiveness of Safe Routes to School and other programs to promote active transportation to school, Portland State University, Initiative for Bicycle and Pedestrian Innovation. Retrieved from <http://www.pdx.edu/ibpi/sites/www.pdx.edu.ibpi/files/Safe%20Routes%20White%20Paper.pdf>.
- Whitt-Glover, M., Porter, A., & Yancey, T. (2013). *Do Short Physical Activity Breaks in Classrooms Work?* A Research Brief. Princeton, NJ: Active Living Research, a National Program of the Robert Wood Johnson Foundation. Retrieved from <http://www.activelivingresearch.org/do-short-physical-activity-breaks-classrooms-work>.
- Young, D.R., Felton, G.M., Grieser, M., Elder, J.P., Johnson, C., Lee, J. & Kubik, M.Y. (2007). Policies and opportunities for physical activity in middle school environments. *Journal of School Health*, 77(1), 41-47.

Appendices

Appendix I: Glossary

academic performance For purposes of this report, academic performance refers to the extent to which students have achieved their educational goals. Academic performance is often measured by letter or number grades in courses or by standardized test scores, but may include other indicators.

active classroom Active classrooms are designed and furnished to facilitate the incorporation of physical activity breaks or other physical activity as a component of classroom instruction time. An active classroom may include tables or chairs that can be folded and stored away to create open spaces and may be constructed with sound-isolating flooring or other materials that prevent activities within the classroom from disturbing others, e.g., in adjacent classrooms.

active transportation Active transportation is any self-propelled, human-powered mode of transportation, such as walking or bicycling.

Source: Centers for Disease Control and Prevention, *Healthy Places, Transportation Health Impact Assessment Toolkit, Strategies for Health-Oriented Transportation Projects and Policies Promote Active Transportation*, http://www.cdc.gov/healthyplaces/transportation/promote_strategy.htm.

food environment For purposes of this report, food environment includes physical settings at K–12 school sites where the cost and availability of food and/or beverages influence what students and others eat, including locations where food and/or beverages are made available, stored, prepared, served, consumed, or grown including but not limited to school kitchens, cafeterias, stores, kiosks, vending machines, gardens, and outdoor dining areas.

Source: Adapted from Johns Hopkins Bloomberg School of Public Health, *Teaching the Food System, A project of the Johns Hopkins Center for a Livable Future*, http://www.jhsph.edu/research/centers-and-institutes/teaching-the-food-system/curriculum/_pdf/Food_Environments-Vocabulary.pdf.

food insecurity As used in this report, food insecurity means a household-level economic and social condition characterized by limited or uncertain access to adequate food. The U.S. Department of Agriculture (USDA), in annual food security surveys and reports, categorizes households as having food security, low food security, and very low food security, based on household members' responses to an annual food security survey. Households with very low food security include those where, at multiple times during the year, the food intake of household members is reduced and normal eating patterns are disrupted because the household lacks money and other resources for food.

Source: Economic Research Service, U.S. Department of Agriculture, *Definition of Food Security* (September 3, 2014), <http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx>.

food waste For purposes of this report, food waste is defined as the component of food loss that occurs when an edible food item goes unconsumed, for example, the edible amount of food that is served to but discarded by students for any reason.

Source: U.S. Department of Agriculture, Office of the Chief Economist, *U.S. Food Waste Challenge, Frequently Asked Questions*, <http://www.usda.gov/occe/foodwaste/faqs.htm>.

free and reduced-price lunch Free and reduced-price lunch is a component of the National School Lunch Program (NSLP) (see National School Lunch Program, Glossary). Generally, any public or nonprofit private school or residential child care institution of high school grades or younger may participate in the NSLP. School districts and independent schools that choose to participate in the NSLP get cash subsidies and foods from the USDA for each meal they serve. In return, they must serve lunches that meet federal nutrition requirements and must offer free or reduced-price lunches to eligible students. Students from families with incomes at or below 130 percent of the national poverty level are eligible for free lunch. Students from families with incomes between 130 and 185 percent of the poverty level qualify for reduced-price meals, for which they cannot be charged more than 40 cents. Students from families with incomes over 185 percent of the poverty level generally pay full-price for school meals (although all meals are subsidized to some extent). For the period from July 1, 2013 to June 30, 2014, 130 percent of the poverty level was \$30,615 for a family of four, and 185 percent of the poverty level was \$43,568. Local school food authorities set the price for full-price meals, but must run the meals program as a non-profit program. In 2014, the Minnesota Legislature expanded student access to free school lunch by eliminating the 40-cent fee for reduced-price lunch.

Source: Food and Nutrition Service, U.S. Department of Agriculture, *NSLP Fact Sheet*, <http://www.fns.usda.gov/sites/default/files/NSLPFactSheet.pdf>.

from-scratch cooking/scratch cooking/preparing meals from scratch From-scratch cooking (alternatively, scratch cooking or preparing meals from scratch) means preparing foods mostly or entirely using basic ingredients, rather than purchasing and serving meals that have already been prepared elsewhere. Preparation of meals from scratch can be done on-site in a school kitchen, at a centralized school district kitchen, or by a combination of these options.

Source: Macmillan Dictionary, Open Dictionary (online), definition of “scratch-cooking”, <http://www.macmillandictionary.com/us/open-dictionary/entries/scratch-cooking.htm>.

green space For purposes of this report, green space is defined to mean a portion of land on school property that is partly or completely covered with grass, trees, shrubs, or other vegetation and accessible for use by students and/or community members. Green space may include natural features of an outdoor school environment such as an open grass field, prairie, stream, or wooded area.

health equity As used in this report, health equity means when all people have the opportunity to attain their full health potential and no one is disadvantaged from achieving this potential because of their social position or other socially determined circumstance.

Source: Centers for Disease Control and Prevention, *Social Determinants of Health, Definitions* (online resource), <http://www.cdc.gov/socialdeterminants/Definitions.html>; Braveman, P.A., *Monitoring equity in health and healthcare: a conceptual framework. Journal of health, population, and nutrition*, 2003. 21(3): p. 181.

Health Impact Assessment (HIA) Health impact assessment (HIA) is commonly defined as “a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population” (European Centre for Health Policy, 1999).

HIA can be used to evaluate objectively the potential health effects of a project or policy before it is built or implemented. It can provide recommendations to increase positive health outcomes and

minimize adverse health outcomes. A major benefit of the HIA process is that it brings public health issues to the attention of persons who make decisions about areas that fall outside of traditional public health arenas, such as transportation or land use.

Source: Centers for Disease Control and Prevention, <http://www.cdc.gov/healthyplaces/hia.htm>.

Health in All Policies (HiAP) Implementation of a Health in All Policies approach to decision-making promotes consideration of health impacts in policies, projects, programs or processes that are not typically associated with the health sector — in this case, the education sector. The HiAP framework encourages planners and policymakers to analyze the likely impact of a proposed policy, plan, program, or process on population health, the underlying principle being that decisions in all sectors invariably impact the health of populations. The resulting decisions, because they are informed by an awareness of probable health impacts, are likely to help reduce health disparities among populations. HIAs are used within an overall HiAP framework as a research tool or mechanism for conducting an analysis and making recommendations.

inclusive decision-making Whether informal or formal, inclusive decision-making is a philosophical and practical approach to collaborative planning, problem solving and decision-making. Inclusive decision-making helps ensure that those who are affected by a decision and those who are responsible for a decision's implementation will be actively and legitimately involved in an established process of decision-making that respects, listens to, and considers all legitimate points of view.

Source: Adapted from Minnesota Independent School District #911, Cambridge, Minnesota, *Policy #105*, http://www.cambridge.k12.mn.us/~doffice/policymanual_files/105.pdf.

“Inclusive decision-making is a key element in a strategy in building consensus — balancing, reconciling, and even trading-off — of competing interests and priorities of various stakeholders.”

Source: Lars Reutersward, UN-HABITAT, Presentation at 7th Global Forum on Reinventing Government, “Local Government, Inclusive Decision-making and Conflict Prevention,” <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan026764.pdf>.

location efficiency Location efficiency refers to the “inherent efficiency of a place.” As used in this report, location efficiency refers to the interconnection between a school and its surrounding community including the location of the school in relation to students’ homes and key community assets, access to multi-modal transportation, shared use of school facilities and grounds, and intergovernmental collaboration to create and support such interconnections.

Source: Center for Neighborhood Technology, *Location Efficiency* (online resource), <http://www.cnt.org/tcd/projects/location-efficiency>; Center for Cities & Schools, *Partnering with K–12 Education in Building Healthy, Sustainable, and Competitive Regions, A California Policy Symposium* (2012), http://citiesandschools.berkeley.edu/reports/ProceedingsSum_062113.pdf.

magnitude of impact Practice standards for HIAs indicate that, to support determinations of impact significance, an HIA should characterize health impacts using certain parameters, including magnitude of impact. Magnitude of impact considers how widely the effects would be spread within a population or across a geographical area.

Source: Bhatia R, Farhang L, Heller J, Lee M, Orenstein M, Richardson M and Wernham A. *Minimum Elements and Practice Standards for Health Impact Assessment, Version 3*. September, 2014, available at <http://hiasociety.org/wp-content/uploads/2013/11/HIA-Practice-Standards-September-2014.pdf>.

National School Lunch Program (NSLP) The National School Lunch Program is a federally assisted meal and snack program that operates in K–12 public and nonprofit private schools and residential child care institutions, providing nutritionally balanced, low-cost or free lunches to students each school day. The program was established in 1946 under the National School Lunch Act and signed into law by President Truman.

Source: Food and Nutrition Service, U.S. Department of Agriculture, *NSLP Fact Sheet*, <http://www.fns.usda.gov/sites/default/files/NSLPFactSheet.pdf>.

potential reach Potential reach means the distribution of effects within a population, i.e., the proportion of a population reasonably expected to be affected.

scramble design cafeteria A scramble design serving area/cafeeteria arrangement where students are allowed to freely move from counter to counter to make food selections. This system requires more space than a traditional cafeteria, but offers students more choices and greater serving rates compared to a traditional, straight serving line.

Source: Silberberg, Susan Crowl. Nat'l Food Service Mgmt. Inst., *The New Design Handbook for School Food Service (Revised)* (1997), <http://files.eric.ed.gov/fulltext/ED432881.pdf>.

siting (or school siting) Siting refers to the particular location (place) of a school facility and grounds. In the context of this report, school siting also refers to the process of selecting a school site, which includes consideration of the environment (positive and negative aspects) in close proximity to the site such as roads, bike/pedestrian paths, grocery stores, libraries, parks, community centers, health care centers, natural resources, nearby sources of pollution, as well as constraints such as the cost of land, space requirements/needs, and opportunity for future expansion.

social determinants of health The term, social determinants of health, refers to the complex, integrated, and overlapping social structures and economic systems that are responsible for most health inequities, including the social environment, physical environment, health services, and structural and societal factors. Social determinants of health are shaped by the distribution of money, power, and resources throughout local communities, nations, and the world.

Source: Centers for Disease Control and Prevention, *Social Determinants of Health, Definitions* (online resource), <http://www.cdc.gov/socialdeterminants/Definitions.html>, citing Commission on Social Determinants of Health (CSDH), *Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health* (2008), World Health Organization: Geneva.

walk zone A school walk zone is usually a subset of a school's enrollment zone and can be set by either state or local policies. School walk zones are typically a half-mile to one mile from elementary schools and may be a greater distance from secondary schools, e.g., under one mile from middle schools or under two miles from high schools. Students who live within a walk zone are usually ineligible for bus service; however, local policies vary and can determine the walk zone as well as which students can reasonably be expected to walk or bike to school.

Source: National Center for Safe Routes to School, *Safe Routes to School Guide, Engineering, Around the School*, http://guide.saferoutesinfo.org/engineering/the_school_zone.cfm; Minneapolis Public Schools, School Bus Transportation (online resource), https://schoolrequest.mpls.k12.mn.us/transportation_services.

Appendix II: Resources

This appendix contains information on research, programs, data, guidelines, and other resources available at both the state and national level.

FOOD ENVIRONMENT

Cornell University Food and Brand Lab

The Food and Brand Lab is an interdisciplinary group of graduate and undergraduate students from psychology, food science, marketing, agricultural economics, human nutrition, education, history, library science, and journalism along with a number of affiliated faculty. Their research focuses on better understanding consumers and how they relate to foods and packaged foods. Their research has driven the creation of the Smarter Lunchrooms Movement and the Cornell Center for Behavioral Economics in Child Nutrition Programs (BEN) — two programs devoted to funding, conducting, and disseminating research concerning children’s health.

<http://foodpsychology.cornell.edu>

Creating Supportive School Nutrition Environments

Created by Bridging the Gap in response to the Child Nutrition and WIC Reauthorization Act of 2004 and the *Healthy, Hunger-Free Kids Act of 2010*, this brief outlines strategies for creating school wellness policies. The brief describes opportunities to improve policies and when and where policies have been well-established and successful.

http://www.bridgingthegapresearch.org/_asset/fk6slr/BTG_LWP_school_nutrition_brief_Jun_14.pdf

Farm to School Programs

Farm to school programs link students to nearby small and mid-size farms and ranches that produce fresh, healthy and minimally processed foods that are served at their schools.

<http://farm2schoolmn.org>

- Minnesota Department of Agriculture, Farm to School Grant Program
<http://www.mda.state.mn.us/grants/grants/mnfarmtoschool.aspx>
- University of Minnesota
<http://www.extension.umn.edu/food/farm-to-school/toolkit>
- National Farm to School Network
<http://www.farmtoschool.org/our-network/Minnesota>
- Minnesota Department of Health
<http://www.health.state.mn.us/fts>
- Institute for Agriculture and Trade Policy Farm2School
<http://farm2schoolmn.org>
- USDA grant program
<http://www.fns.usda.gov/farmtoschool/farm-school-grant-program>
- USDA Farm to School Census
<http://www.fns.usda.gov/farmtoschool/census#/state/mn>

Great Trays

The Great Trays™ Toolkit for School Foodservice provides tools, information, and resources to: plan kid-tested nutritious menus that meet the new federal nutrition standards for school lunch and breakfast programs; start and promote farm to school programs; save money on food purchasing; and nudge students toward healthier choices.

<http://www.extension.umn.edu/family/health-and-nutrition/toolkits-and-resources/great-trays/>

Healthy Eating Design Guidelines for School Architecture

This set of guidelines provides architects and school representatives with a set of principles and strategies that can be used to design a healthy school food environment. Specific guidelines are offered for 10 different domains, including commercial kitchen areas, serving zones, dining zones, overall aesthetics, and signage/marketing. Huang, T. T-K., Sorensen, D., Davis, S., Frerichs, L., Brittin, J., Celentano, J., Callahan, K., & Trowbridge, M.J. (2013). Healthy eating design guidelines for school architecture. *Preventing Chronic Disease, (10)*.

http://www.cdc.gov/pcd/issues/2013/12_0084.htm.

Healthy Eating and Physical Activity Standards, National Institute of Out-of-School Time

National AfterSchool Association standards and guidelines address healthy eating and physical activity, including staff training, programs, and the environment.

<http://www.niost.org/HOST-Program/Standards-and-Guidelines>

Healthy Eating Research

A program of the Robert Wood Johnson Foundation, Healthy Eating Research aims to promote healthy eating among children and prevent childhood obesity. The program's research focuses on populations with the highest risk for obesity, including racial, ethnic, and economic minorities.

<http://healthyeatingresearch.org/>

Kids' Safe and Healthful Foods Project

“The Kids' Safe and Healthful Foods Project, a collaboration between the [Robert Wood Johnson Foundation](#) and [The Pew Charitable Trusts](#), provides nonpartisan analysis and evidence-based recommendations on policies that affect the safety and healthfulness of school foods.”

<http://www.pewtrusts.org/en/projects/kids-safe-and-healthful-foods-project>

Minnesota Food Charter

The Minnesota Food Charter is a roadmap designed to guide policymakers and community leaders in providing Minnesotans with equal access to affordable, safe, and healthy food wherever they live. Of particular note is its *School Leader Guide*, which specifically addresses the school food environment and offers strategies for parents, teachers, school boards, state government, food service employees, and others.

<http://mnfoodcharter.com>

School-Community Kitchens: Resource Hubs Serving Students and Surrounding Communities

This paper was published alongside other publications under the *Rethinking School Lunch* project created by the [Center for Ecoliteracy](#). This paper details examples of successful prototype commercial kitchens throughout the country that are shared by schools and their surrounding communities.

http://www.ecoliteracy.org/sites/default/files/uploads/shared_files/CEL-School-Community-Kitchens.pdf

School Garden Programs

School gardens give students a hands-on opportunity to learn more about their food. Students who help grow fruits and vegetables are more likely to select them in the lunchroom and do better in the classroom. School gardens also provide educational opportunities in several curricular areas, including math (measuring growth rates), science (investigating functions of plant structures), art (using plant-derived pigments), social science (cultural differences in food consumption and gardening practices), and language arts (keeping daily garden journals).

http://www.farmtoschool.org/Resources/School_Gardens_Fact_Sheet.pdf

- University of Minnesota
<http://www.extension.umn.edu/food/farm-to-school/school-gardens>
- Minnesota Department of Agriculture, Minnesota School Gardens:
A Guide to Gardening and Plant Science
<http://www.mda.state.mn.us/kids/gardenguide.aspx>
- USDA
<http://healthymeals.nal.usda.gov/resource-library/school-and-preschool-gardens>
- National Farm to School Network
<http://www.farmtoschool.org/resources>

PHYSICAL ACTIVITY

Active Living Research

Launched and funded in part by the Robert Wood Johnson Foundation, this program's purpose is to promote physical activity for children with the goal of reducing childhood obesity, an issue that is especially prevalent in children of color and lower-income children. Research focuses on the root causes of childhood obesity and the most effective ways to combat obesity through physical activity.

<http://activelivingresearch.org>

Comprehensive School Physical Activity Policy Continuum

Created by the National Physical Activity Plan: Make the Move, the Continuum is a tool that “identifies key policy items and provides several options for policy language” based on the Comprehensive School Physical Activity Program created by the National Association of Sport and Physical Education (NASPE). The policies are designed to be implemented at the local, district, and/or state level.

http://c.ymcdn.com/sites/www.chronicdisease.org/resource/resmgr/school_health/cspap_policy_continuum_final.pdf

Moving Matters! A School Implementation Toolkit

This toolkit, developed by the Minnesota Department of Education and Minnesota Department of Health, offers strategies to increase student physical activity through quality physical education as well as active school efforts that encourage physical activity during and outside of the school day.

<http://www.health.state.mn.us/divs/hpcd/chp/cdrp/physicalactivity/docs/MovingMattersImplementationToolkit.pdf>

Safe Routes to School (SRTS)

Safe Routes to School programs provide funding to communities to make improvements to the routes children use to walk and bike to school and get the exercise they need.

- National Center for Safe Routes to School
<http://www.saferoutesinfo.org>
- Minnesota Department of Transportation
<http://www.dot.state.mn.us/saferoutes/about.html>
- Safe Routes to School National Partnership
<http://saferoutespartnership.org>

Tips for Teachers: Promoting Healthy Eating & Physical Activity in the Classroom

Distributed by the National Center for Chronic Disease Prevention and Health Promotion, this guide provides advice for teachers on how to incorporate healthy eating and physical activity best practices into the classroom and the school environment, in general.

http://www.cdc.gov/healthyouth/npao/pdf/Tips_for_Teachers_TAG508.pdf

Walk! Bike! Fun! Curriculum

A two-part curriculum designed specifically for Minnesota schools and structured to meet Minnesota education standards. This curriculum helps students, ages five to thirteen, learn traffic rules and regulations, potential hazards, and handling skills needed to bike and walk effectively, appropriately, and safely through their community.

<http://www.dot.state.mn.us/saferoutes>

STATE AND FEDERAL AGENCIES AND PROGRAMS

Minnesota Department of Agriculture

<http://www.mda.state.mn.us>

Minnesota Department of Education

<http://education.state.mn.us>

- School Report Card
<http://rc.education.state.mn.us/>
- Guide for Planning School Construction Projects in Minnesota
<http://www.education.state.mn.us/mde/schsup/schfin/factech/schcon/index.html>

Minnesota Department of Health

<http://www.health.state.mn.us>

- School Environmental Health Plan
<http://www.health.state.mn.us/divs/eh/schools>
- Statewide Health Improvement Program
<http://www.health.state.mn.us/ship>

Minnesota Pollution Control Agency

- Minnesota green building resources for schools and the Minnesota Green Schools Coalition
<http://www.pca.state.mn.us/index.php/living-green/living-green-educators/green-building-resources-for-schools.html>

United States Department of Agriculture (USDA)

www.usda.gov

- Environmental Protection Agency (EPA)
- Local government and school: A community-oriented approach
<http://www.epa.gov/smartgrowth/publications.htm#schools>

United States Department of Education (US DOE)

- Green Ribbon Schools
<http://www2.ed.gov/programs/green-ribbon-schools/index.html>
- Green Strides Program
<http://www2.ed.gov/about/inits/ed/green-strides/index.html>

DATA SOURCES

Growth and Disparity: A Decade of U.S. Public School Construction

“This report provides a comprehensive analysis of who has benefited from school construction spending across the nation. In this report, the Building Educational Success Together (BEST) research team looks at how much was spent, what was accomplished, and which students and communities saw benefits. The analysis looks at the decade from 1995, when the GAO report was first released, through 2004, the most current information available.”

<http://www.21csf.org/csf-home/publications/best-growth-disparity-2006.pdf>

Minnesota Student Survey (2013)

Since 1989, the Minnesota Student Survey has been administered by four state agencies (Minnesota Departments of Education, Health, Human Services, and Public Safety) every three years. All school districts are encouraged, but not required, to participate in the survey. While this statewide survey is the best source of statewide data on student health and health behavior publicly available, there are limitations to the data. Most notably, school district participation in the Minnesota Student Survey has generally declined over time. In 2013, 84 percent of school districts administered the survey, the

lowest participation rate since the survey was first developed in 1989. Overall, 69 percent of Minnesota 9th grade students completed the survey. The overall participation is low because the survey was not administered in some of the state's largest school districts including Minneapolis, which fielded its own survey. In addition, the survey has not been translated into languages other than English. As a result of these limitations, the survey results may not fully represent the experience of all 9th grade students, particularly students of color and/or those for whom English is not their primary language.

<http://www.health.state.mn.us/divs/chs/mss>

National Safe Routes to School Database

This website houses state and national data on Safe Routes to School programs, including data collection and evaluation tools to simplify the process. The website also features local success stories, reports on the national progress of SRTS, and contact information for local SRTS coordinators and administrators.

<http://www.saferoutesinfo.org/data-central>

DESIGN GUIDELINES AND EXAMPLES

Healthy Eating Design Guidelines for School Architecture

Huang, T. T-K., Sorensen, D., Davis, S., Frerichs, L., Brittin, J., Celentano, J., Callahan, K., & Trowbridge, M.J. (2013). Healthy eating design guidelines for school architecture. *Preventing Chronic Disease, (10)*.

http://www.cdc.gov/pcd/issues/2013/12_0084.htm.

VMDO Architects Case Study

http://www.vmdo.com/docs/Buckingham_VMDO_Case_Study.pdf

We Move Schools Forward

<http://wemoveschoolsforward.com>

Center for Cities & Schools, University of California Berkeley

Partnering with K–12 Education in Building Healthy, Sustainable, and Competitive Regions: A California Policy Symposium (*among numerous other reports*)

“We provide thoughtful, objective, and empirically-driven research and policy and practice recommendations to California’s local and state leaders to ensure high quality learning environments for all children in schools that are sustainable centers of communities. Our work is greatly informed by the growing evidence that public school environments contribute to student achievement and community quality; public schools are unique and influential public infrastructure.”

<http://citiesandschools.berkeley.edu/facilities.html>

Checklist: Building Design, Center for Active Design

This checklist provides ideas for promoting active living through building design. Many, if not all, of the suggested ideas are applicable to school design.

<http://centerforactivedesign.org/guidelines/>

Checklist: Active Living Design, Hennepin County

This checklist provides guidelines for planners and developers to create communities that support active living.

<http://www.hennepin.us/activeliving>

PK–12 Public Educational Facilities Master Plan Evaluation Guide, 21st Century School Fund

“This evaluation guide was designed for superintendents and school boards that are called on to develop or sign off on plans, but who generally may not have extensive experience with educational facility planning. It can also be used to help community members participate in high quality educational facility planning.”

<http://www.21csf.org/csf-home/Documents/21CSFMFPEvaluationChecklistAugust2011.pdf>

New York City Active Design Guidelines: Promoting Physical Activity and Health in Design

This set of guidelines provides architects and urban designers with a manual that can be used to create healthier buildings, streets, and urban spaces. The New York City guidelines were developed collaboratively by architects, planners, and public health professionals to reflect the most current research exploring the relationship between design and health.

www.nyc.gov/adg

SHARED USE OF FACILITIES AND GROUNDS

A Policy Framework for Joint Use: Enabling and Supporting Community Use of K–12 Public School Facilities, University of California Berkeley

“Building upon our [21st Century School Fund and Center for Cities and Schools] 2010 paper titled Joint Use of Public Schools: A Framework for a New Social Contract, this paper identifies the policy framework needed to support sustainable joint use of public schools. Our goal with this paper is to provide local and state leaders with the policy framework needed to enable and support community use. The policy framework addresses the challenges to harnessing the opportunities and benefits of the community use of K–12 public schools.”

http://citiesandschools.berkeley.edu/reports/policy-framework-for-joint-use%202014__proofed2.pdf

School-Community Kitchens: Resource Hubs Serving Students and Surrounding Communities, Center for Ecoliteracy

This concept paper presents ideas for school-community kitchens wherein schools partner with surrounding neighborhoods, sharing resources “to support the health of students and residents, improve academic achievement, enhance community vitality, and promote justice and equity.”

<http://www.ecoliteracy.org/downloads/school-community-kitchens>

Finding Space to Play: Legal and Policy Issues Impacting Community Use of School Property

This report provides information regarding current efforts to enable community recreational use of school property to provide safe, affordable and convenient recreational facilities to communities, increase physical activity, and reduce obesity.

http://publichealthlawcenter.org/sites/default/files/resources/PHLC_Finding%20Space%20to%20Play_2012.pdf

Minnesota Recreational Use Materials

This set of resources identifies liability issues, risk management strategies, and available resources for Minnesota schools allowing community recreational use of school property.

<http://publichealthlawcenter.org/resources/minnesota-recreational-use>

SCHOOL SITING AND LOCATION

Green Health: Building Sustainable Schools for Healthy Kids

This summary of an October 2011 workshop co-sponsored by the National Collaborative for Childhood Obesity Research and the National Academy of Environmental Design, in partnership with others, addresses topics relevant to this HIA.

http://nccor.org/downloads/green-health-report_2012-06-04_complete.pdf

Policy Recommendations for Encouraging Community-Centered Schools, Helping Johnny Walk to School

Distributed by the National Trust for Historic Preservation, this guide promotes the financial and health benefits of community-centered schools. The guide identifies barriers to community-centered schools and provides actions steps to overcome these barriers.

<http://www.preservationnation.org/information-center/saving-a-place/historic-schools/helping-johnny/schools-policy-recommendations.pdf>

EMPLOYEE WELLNESS

School Employee Wellness: A Guide for Protecting the Assets of Our Nation's Schools

This guide was created to provide best practices for establishing, implementing, and sustaining effective school employee wellness programs.

http://www.healthyschoolsms.org/staff_health/documents/EntireGuide.pdf

Appendix III: Case Studies A and B

CASE STUDY A

Case Study A is a (grades 4–8) middle school in an urban district. The construction and renovation project was pursued because of growing enrollment and a lack of space to meet the needs of residents in the community. A number of updates and additions were made through the project, including: increased classroom size; the addition of a new commons area, gymnasium, and administrative offices; updates to the school kitchen and cafeteria; and a new student entrance. The project ultimately doubled the size of the existing school creating space for a growing student body and also areas more conducive for cooking healthy meals from snack and incorporating active classroom practices into the school day.

School stats at-a-glance

School A is a growing neighborhood school with a diverse student body. In addition, over half of the student body (56%) qualifies for **free and reduced-price lunch**. The school is located in a residential neighborhood that is home to a growing number of young families. Based on this trend and the number of younger students nearby elementary schools, enrollment at this middle school is projected to grow.

Overview of key construction features

The school had been an elementary school building, so many of the rooms and spaces (e.g., bathrooms, classrooms) were simply too small for an older group of students. In addition, the school did not have a kitchen where they could prepare foods on site and the size of the cafeteria was also inadequate for their growing student body. Another critical gap was the lack of an indoor gymnasium.

The school renovation and new construction project led to a number of enhancements that addressed the concerns of parents and that that created a more flexible learning environment for students. The school renovation project added a new gymnasium, kitchen and cafeteria, commons area, theatre, administration office, and multiple classrooms to the new school building. The renovation included the creating of small spaces outside the classroom that can be used for alternative learning areas or movement breaks.

Inclusive decision-making

Parents were heavily involved in advocating for the school renovation to be prioritized by the district, engaging neighborhood residents and city council representatives in the work to push for updates to the school building. A small group of parents continued to be heavily involved throughout the design and planning stages of the construction project, proactively providing the architects with a list of design features they felt were most important and providing feedback to designs prepared. A school district representative was heavily involved in the planning process, and has ultimately adopted

FIGURE 27: Student population characteristics

Total number of students	366
Percentage of students of color	52%
PERCENTAGE OF STUDENTS WHO	
are English-language learners	18%
qualify for free/reduced-price lunch	57%
qualify for special education	15%
Graduation rate	N/A

Source: Minnesota Report Card <http://rc.education.state.mn.us/>

the approach used at this school to guide planning processes used by other schools in the district. Because the school shares space with the city park and recreation department, a representative of that department was involved throughout the project, particularly around decisions related to the school's footprint and gymnasium space.

Location efficiency/siting

The renovated school sites on the same site, but has a footprint nearly twice the size of the old building. The school shares a large city block with a city park and recreation center. During the planning process, decisions had to be made about whether to prioritize keeping some existing playground equipment or keeping open spaces used for soccer, softball, and other activities. The group prioritized the open spaces, but was able to also keep most of the playground equipment at the site.

The school is located in a residential area and surrounded by streets with fairly low levels of traffic. However, the streets are not wide enough to accommodate a bike lane, which poses a barrier for some students to walk to school. A few blocks away, there are residential streets with heavier traffic and busy intersections. School administrators do worry about the safety of students walking at those locations and have been trying to work with the city to address their concerns.

Although the school is located in a residential area, relatively few students who attend the school live in the school's walk zone. Once a week, the school does participate in a school bus stop and walk program, where all buses drop students off at a nearby park and students walk together to school accompanied by school staff and volunteer parents. One school bus does wait at the park to drive any students to school who opt out of walking that day. School administrators have observed that students seem to be quieter after walking to school and start the day ready to learn.

Food environment

School lunches have improved dramatically with the new kitchen and cafeteria space. The kitchen now has adequate refrigeration and freezer space, allowing school nutrition staff to prepare meals with more fresh food options. Prior to the renovation, the school could only offer brown bag lunches and pre-packaged meals. There are two lunch periods and during each, two serving lines are available to students, as is a stand-alone salad bar.

Physical environment

Inside the building, wide stairways are prominent in the 2-story school. To the extent possible, construction elements from the original building were carried over into the new construction areas, to create a seamless transition between buildings. One of the most noticeable improvements to the school is a large gymnasium, which is used for physical education classes, student athletics and other activities before and after school, and community groups, including the city parks and recreation department.

Teachers and staff at the school have received training on active classroom principles and work to incorporate these practices into their classes regularly. Teachers and staff at the school also make use of other learning spaces in the school building on the school grounds.

Shared-use agreements

The school sits on the same block as a city park and recreation building and shares the outdoor spaces with the city. The school and city work collaboratively to offer programming to students and community residents that take advantage of both the indoor and outdoor spaces available while avoiding scheduling conflicts. To a large degree, these arrangements have been relatively informal. Overlapping requests for space rarely occur, as activities through the city parks department tend to occur outside of the school day, on evenings and weekends. The school principal noted that any other potential scheduling issues that might occur when other nearby schools also want to use the green areas of the park grounds for activity and learning spaces are worked out informally.

CASE STUDY B

Case Study B is a 7–12 school located in a rural district. At the original high school, a number of additions had been completed over the years, resulting in a school floor plan that was not cohesive and did not make all areas of the floor accessible for persons with disabilities. Their heating and cooling system could not maintain a consistent temperature throughout the building and they had experienced a number of problems with air quality.

Despite these concerns, the school district originally lacked the residents support needed to pass a referendum for a school bonding bill. A number of potential solutions were considered: a full renovation of the original site to build a K–12 school; building a new K–12 building at a “neutral site” located between the district’s largest communities; and doing projects on both schools, a renovation of the district’s elementary school and new construction of a grades 7–12 high school on the edge of town which had been home to the older high school building. The last option was eventually approved by voters, in large part due to a land owner donating land for the new building site and the district’s ability to seek federal stimulus dollars to lower the bond interest rate, which reduced the general obligation debt being paid from taxes by millions of dollars.

School stats at-a-glance

School B is a relatively small school. While the student body is not very culturally diverse, there is socioeconomic diversity within the school. Nearly forty percent of the students qualify for the free or reduced-price lunch program.

School enrollment is expected to increase over the next 5 to 10 years. The overall population in the area is expected to grow as more families move to the area and fewer young adults move away. School administrators also anticipate that the number of families who had used the open enrollment option so that their children could attend a school with better facilities will decrease.

FIGURE 28: Student population characteristics

Total number of students	311
Percentage of students of color	6%
PERCENTAGE OF STUDENTS WHO	
are English-language learners	<1%
qualify for free/reduced-price lunch	39%
qualify for special education	11%
Graduation rate	86%

Source: Minnesota Report Card <http://rc.education.state.mn.us/>

Overview of key construction features

The newly constructed high school includes a number of features that create a positive learning environment for students and an important gathering place for community residents. Some of the learning amenities include: a wireless wi-fi network, laptop computers for students, and a variety of technology updates to support instruction in a variety of courses; a design layout that minimizes security risks by creating one entry point by the school office when school is in session and security cameras placed throughout the school building and grounds; and a number of multi-purpose rooms that can be used for storage, athletic practice space, event space, and/or arts practices and performance areas. Natural light is available in all but one classroom. The materials selected in classrooms and hallways are easy to clean and dampen noise levels.

Climate control, a major problem at the old school site, is another important feature at the new school. The building uses geo-thermal heating and also has air conditioning, in-floor heating in some areas, and improved insulation to ensure consistent temperatures and reduce energy costs. The school incorporated a number of green building principles into their design and construction. This allowed them to reduce energy costs and take advantage of various rebates and incentives; however, it was not a priority for the building to be LEED-certified.

Inclusive decision-making

The school's location was selected in large part because a land owner was willing to donate land to the school. After that offer was made, other sites were not considered. Teachers and staff were heavily involved in the school design process. A small three-member Facilities Committee was formed to tour a number of recently constructed schools to consider which architect to select and to identify the building and classroom design features that they wanted to incorporate into their building design. School teachers and staff also toured other buildings and were able to give strong direction to the selected architecture firm about the overall building design and specific classroom features. The school board was engaged in the planning process and parents had opportunities to give feedback to the final design. However, the planning process did not formally involve public health professionals, city planners, or other key sectors.

Location efficiency/siting

The new high school is located on the outer edge of one of the district's larger communities, and shares a border with an area of new residential development. The other sides of the school grounds share a border with farmland. A major 4-line highway is located within a mile within the school; 2-lane roads with reduced speeds lead directly to the building. There are not sidewalks along these roads, but plans are in place to add walking and biking paths in the future.

Relatively few students live in the town where the school is located, so the location of the school and its surrounding walking and biking infrastructure impact a relatively small number of students. A narrow bridge without adequate width sidewalks and lanes for biking, is a barrier for some students to walk or bike to school and impacts the community's overall walkability. The bridge is due for maintenance, and so the school has started some Safe Routes to School planning efforts to help consider ways to improve the bridge when the repair work begins.

Food environment

The kitchen preparation, storage, and serving areas improved dramatically with the new construction project. One nutrition services member estimated the new space was approximately twice the size as available in the old high school. The school has two lunch periods; approximately 150 students are served in each period. Two serving lines are available to students, each with a different hot meal option. A stand-alone salad bar is not in place, but multiple fruit and vegetable options, including salad, are available in each line.

To meet United States Department of Agriculture (USDA) requirements, a student must have two half-cup servings of fruit and/or vegetable on their lunch tray for them for the school to receive federal lunch reimbursement for the meal. School administrators and nutrition staff have found that, by offering 10–12 fruit and vegetable options at each meal, students can always find something that they like to eat. Overall, participation in the school lunch program has increased since moving to the new school; approximately 95 percent of students eat lunch at school. School staff attribute this shift to changes in the food environment and to the increased variety of foods served. They haven't measured changes in food waste, but have observed that students throw out relatively little food each day.

Physical environment

Inside the building, wide stairways are prominent in the 2-story school. There is a large gymnasium and an auditorium with multi-purpose flooring so that the space can also be used for physical activity. Ancillary spaces include a fitness room with cardio and weights equipment, as well as spaces for wrestling practice and equipment storage.

Outside of the building, there are now separate drop-off areas for buses and parent drop-off. The school grounds include green areas and outdoor athletic fields for baseball, softball, and football. There are plans for the school to create additional outdoor areas for recreation and learning, such as a plan to create a small prairie and outdoor learning classrooms. There are green spaces for students to use before and after school. More outdoor seating areas will likely be added as the school works on its school grounds.

Shared-use agreements

The school does not have any formal shared-use agreements in place, but requests to use the school building are regularly made and accommodated by the school. The school administrators want the school to be a place where the community is welcome and feel the comfortable design of the space, adequate parking, handicap accessibility, and wireless access are all reasons that community groups are interested in using spaces in the school. They estimate that requests from community groups to use the school have quadrupled since they moved to the new building. For example, the computer lab has been used by groups who need to do online training, the home economics room has cooking stations that have been used for cooking classes and by groups, the wrestling room has been used by the police department to teach defense training, and the cafeteria has hosted a number of benefit dinners.

Relevant data

At a local level, School B has also collected information on student absenteeism and other school climate measures (Figures 29, 30). The data demonstrate positive changes in student absenteeism and truancy, as well as recognition of positive behavior that coincides with the move to the new building (starting in the

2011–12 school year). Changes over time are likely attributable to multiple sources, including changes in school policies and participation in programs that encourage a positive school environment. While the new school construction may not be the direct cause of these positive changes, it may be a contributing factor to a positive school climate that encourages student wellness and academic success.

FIGURE 29: Minnesota Student Survey results

Percentage of students who:	8th grade	11th grade
Went to the nurses office 6 or more times in the last 30 days	0%	0%
Stayed home from school because of illness 6 or more times in the last 30 days	2%	0%
Were physically active for at least 60 minutes 5 or more days during the past week	42%	51%
Ate at least one serving of fruit a day during the past week	31%	24%
Ate at least one serving of vegetables a day during the past week	29%	36%
Agree "very much" or "quite a bit" that teachers/other adults at school care about them	48%	51%
Agree "very much" or "quite a bit" that friends care about them	71%	87%

Source: Minnesota Student Survey data (2013), provided by School B school district.

FIGURE 30: School climate indicators

	Old school building			New school building	
	2008–09	2009–10	2010–11	2011–12	2012–13
Monthly average daily attendance	95%	96%	96%	96%	96%
Average unexcused absences, by entire student population	15.9	10.2	11.3	6.5	4.3
Average tardies, by entire student population	6.9	4.4	4.1	3.9	3.0
Percentage of student recognized quarterly for Good Conduct	58%	61%	66%	71%	71%
Number of students "habitually truant" (defined as missing more than 7 school days without lawful excuse)	39	35	39	16	7

Source: School climate indicators (2008-13), provided by School B school district

Note: "Habitually truant" students are defined in Minnesota Statute as a child under the age of 17 who is absent from school without a lawful excuse for 7 school days if they child is in elementary school or for one more class periods on seven school days if the child is in middle, junior high, or high school. For children age 17 or older, it refers to students who have not legally withdrawn from school and who are absent without lawful excuse for one or more class periods on 7 school days.

Appendix IV: Rationale for Estimated Number of Schools Directly Impacted Each Year

These conservative estimates of anticipated construction and major renovation projects are informed by information provided by MDE on past projects and results of the school principal survey. These estimates reflect the average number of new construction and renovation projects approved by MDE during the past five years (Figure 31).

The information we received from school principals suggest these estimates are a reasonable estimate of future changes. School principals who responded to the survey identified a number of school construction and renovation projects are likely to occur in the next five years. Thirteen percent of the 99 principals who completed the online survey have a school construction or major renovation projects planned and approved. These projects include six projects that will address the entire school and two that will include kitchen remodels. An additional 30 schools are considering projects that have not yet been approved, including 13 new construction or major renovation projects, 5 additional schools that include kitchen remodels, 4 schools with changes to indoor gym/fitness areas, and 8 schools with changes to outdoor areas (e.g., sports fields).

FIGURE 31: Estimates of anticipated new construction and major renovation projects

Key Indicator	Number
Number of schools in Minnesota (indirect reach)	2,537
Number of schools in Minnesota expected to be newly constructed or fully remodeled each year	15
Number of schools in Minnesota expected to be newly constructed or fully remodeled over the next 10 years	150
Number of schools in Minnesota expected to undergo renovation projects that will focus on the school food service and/or physical activity areas each year	25
Number of schools in Minnesota expected to undergo renovation projects that will focus on the school food service and/or physical activity areas over the next 10 years	250

Appendix V: Federal and State Policies and Initiatives that Promote Student Health

2004

Child Nutrition and WIC Reauthorization Act of 2004: Local School Wellness Policy (Federal)

This federal mandate requires that all school districts implement school wellness policies.

See 42 U.S.C.A. § 1758b (West 2014); *see also* MINN. STAT. ANN. §121A.215 (West 2014) (requiring Minnesota school districts to post their local wellness plan online whenever possible).

2005

Safe Routes to School Program (Federal)

This program dedicates federal transportation dollars toward encouraging students to safely walk or bike to school.

See 23 U.S.C.A. § 213(b)(3) (2012); Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users or “SAFETEA-LU”, Pub. L. No. 105-59, § 1404, 119 Stat. 1144 (2005).

2008

SHIP (Statewide Health Improvement Program) (Minnesota)

Created by the Minnesota Legislature, SHIP promotes overall health for all Minnesotans, specifically aiming to reduce obesity and tobacco exposure. Grants funds are available to schools that promote this objective.

See MINN. STAT. ANN. § 145.986 (West 2014).

2008

Fresh Fruit and Vegetable Program (Federal)

This federal program provides increased financial support for procurement of fresh fruits and vegetables and locally sourced foods to schools.

See 42 U.S.C.A. § 1769a (West 2014).

2010

Complete Streets Legislation (Minnesota)

Complete Streets legislation provides for the design and implementation of state and local plans that promote safety and accessibility of all Minnesotans to roadways.

See MINN. STAT. ANN. §174.75 (West 2014).

See also, e.g., DULUTH, MINN., RES. 10-0128R (2010, <http://www.mncompletestreets.org/gfx/Duluth%20CS%20resolution.pdf>); NEW HOPE, MINN., RES. 2011 (2011), <http://www.smartgrowthamerica.org/documents/cs/policy/cs-mn-newhope-resolution.pdf>); NORTHFIELD, MINN., RES. 2012-064 (2012), <http://www.ci.northfield.mn.us/DocumentCenter/View/710>.

2010

Healthy Kids Bill (Minnesota)

This Minnesota program rewards K–12 schools for integrating healthy food choices and physical activity into their schools; the Legislature also encouraged MDE to implement active recess guidelines.

See MINN. STAT. ANN. §§ 120B.021, 124D.955 (West 2014).

See also Minn. Dep't of Educ., *Active Recess: A strategy of the Active Schools Minnesota Initiative* (Dec. 17, 2013) <http://www.education.state.mn.us/MDE/StuSuc/Nutr/PhyActiv/053514>.

2010

Healthy, Hunger-Free Kids Act of 2010 (Federal)

Among many other things, this legislation strengthened nutrition standards for school meals and snacks offered through the National School Lunch Program (NSLP).

See Healthy, Hunger-Free Kids Act of 2010, Pub. L. No. 111-296, 124 Stat. 3183 (2010) (codified as amended at 42 U.S.C.A. §§ 1751–69) (West 2014)).

2010

Farm to School Program (Federal)

This program was created by the Healthy, Hunger-Free Kids Act of 2010, and it provides financial support for Farm to School programs.

See 42 U.S.C.A. § 1769(g); Minn. Dep't of Educ., *Farm to School Grant Program*, <http://www.mda.state.mn.us/grants/grants/mnfarmtoschool.aspx> (last visited Nov. 21, 2014).

2010–2012

Great Trays Partnership Initiative (Minnesota)

This program provided financial support and technical assistance for acquisition of kitchen equipment to enable school staff to prepare and serve meals from scratch.

See Minn. Dep't of Educ., *Innovative Public-Private Partnership Helps Minnesota Schools Tackle Childhood Obesity Through Changes in the Cafeteria* (May 24, 2011), <http://www.health.state.mn.us/news/pressrel/2011/trays052411.html>.

2011

Green Ribbon Schools Award Program (Federal)

This program was developed by the U.S. Department of Education to recognize and support schools that strive to be environmentally conscious and champion the health and wellness of school students, staff, and visitors.

See U.S. Department of Education *Green Ribbon Schools*, U.S. DEP'T OF EDUC., <http://www2.ed.gov/programs/green-ribbon-schools/index.html>; see also *Green Ribbon Schools*, MINN. DEP'T OF EDUC., <http://education.state.mn.us/MDE/StuSuc/ScholarRecog>

<http://education.state.mn.us/MDE/StuSuc/ScholarRecog/GreenRibbonSch> (last modified Nov. 19, 2014).

2012

Safe Routes to School (Minnesota)

This legislation created a state grant program that provides funds to support “safe and appealing non-motorized transportation to and from a school.” These funds can be used for infrastructure; public awareness needs; safety, health, and environment education; and program costs.

See MINN. STAT. ANN. § 174.40 (West 2014).

2013

Advancing Health Equity in Minnesota: Report to the Legislature (Minnesota)

The Minnesota Department of Health is now mandated to issue a report to the Minnesota Legislature on best practices and strategies for promoting health equity.

See 2013 Minn. Laws ch. 108, art. 12, § 102 (2014), <https://www.revisor.mn.gov/laws/?id=108&year=2013&type=0>

2013

School Gardens: A Guide to Gardening and Plant Science (Minnesota)

Minnesota’s Agriculture in the Classroom Program (a subset of the Department of Agriculture) created a guide for schools that provides instruction for how to create and maintain a school garden. It also includes lesson plans that can incorporate the school garden.

See MINN. DEP’T OF AGRIC.’S AGRIC. IN THE CLASSROOM PROGRAM, MINNESOTA SCHOOL GARDENS: A GUIDE TO GARDENING AND PLANT SCIENCE (Fall, 2013), <http://www.mda.state.mn.us/kids/gardenguide.aspx>

2013

Active Recess Guidelines Initiative (Minnesota)

Minnesota provides guidelines and resources for schools to use in developing a healthy and active recess program.

See Minn. Dep’t of Educ., *Active Recess: A Strategy of the Active Schools Minnesota Initiative* (Dec. 17, 2013), <http://www.education.state.mn.us/MDE/StuSuc/Nutr/PhyActiv/053514>

See Minn. Dep’t of Health & Minn. Dep’t of Educ., *Moving Matters: A School Implementation Toolkit*, <http://www.health.state.mn.us/divs/hpcd/chp/cdrp/physicalactivity/docs/MovingMattersImplementationToolkit.pdf>.

2014

Legislative Report on K–12 Students’ Experience with Physical Education (Minnesota)

By January 15, 2015, Minnesota’s Commissioner on Education is required to submit a report to the legislature detailing the physical education of school-age children within the state.

See 2014 Minn. Laws, ch. 312, art. 16, sec. 14, <https://www.revisor.mn.gov/laws/?id=312&year=2014&type=0>

ONGOING

U.S. Department of Education’s Green Strides Program (Federal)

Initiatives to make schools healthier, safer, and more sustainable.

See *Green Strides: Environment, Health and Facilities at ED*, U.S. DEP’T OF EDUC., <http://www2.ed.gov/about/inits/ed/green-strides/index.html> (last modified Mar. 12, 2014).

Appendix VI: Letters of Support

MINNESOTA DEPARTMENT OF EDUCATION



June 26, 2013

Health Impact Project
Pew Charitable Trusts
901 East Street NW, 10th Floor
Washington, DC, 20004

Re: Public Health Law Center Proposal: Incorporating Health in School Construction Projects

Dear Selection Committee members:

I appreciate this opportunity to submit a letter in support of the Public Health Law Center's proposal to conduct a Health Impact Assessment (HIA) on the Minnesota Department of Education (MDE) **Guide for Planning School Construction Projects in Minnesota** (MDE Guide). As commissioner, my priority is to improve education outcomes for all students by prioritizing excellence, equity and opportunity, closing the state's achievement gap, supporting high-quality teaching, and using innovative strategies to improve results. The proposed project would complement these goals by advancing the agency's commitment to provide the state's local school districts with the best possible guidance on decision-making about school construction projects.

Updating the MDE Guide is a strong priority. In the decade since it was last updated, new state laws and program initiatives have been implemented that affect school construction planning and decision-making in local districts. Unfortunately, due to budget and staff cuts, MDE has been unable to revisit the Guide. We believe with the help of the HIA and their community partners, MDE will finally have the resources to undergo the revision. Revisions are collaborative processes, typically involving several dozen contributors including architects, planners, school district administrators, teachers, representatives of several state agencies, and many others. The 2003 revision took MDE about seven months to complete. If this HIA project is approved, based on the proposed project timeline, our goal would be to begin the revision process approximately one year from now, pending allocation of staff resources. In addition, the HIA's engagement of community partners will help us identify additional resources to keep the revision on schedule.

In thinking about the next revision, MDE staff members have focused on addressing statutory changes to minimum acreage requirements and decisions about building components that impact school learning such as classroom dimensions and acoustic considerations. By assessing how school siting and school construction decisions impact student and community health and well-being, and by making specific recommendations for revisions to the MDE Guide, the proposed HIA project would enable MDE to fully consider additions that might otherwise

MINNESOTA DEPARTMENT OF EDUCATION (CONTINUED)

have received little attention, yet could significantly strengthen the Guide's value and reach. I would also note that MDE has recently been asked by the Minnesota legislature to assemble a School Facilities Funding Working Group to examine the various options for school facilities funding. That working group will begin this August. The work of that working group could certainly help inform the HIA and vice versa. A bonus is that the HIA report and recommendations could be put to immediate use by local school districts.

MDE staff working on physical activity, physical education, nutrition, and Coordinated School Health issues have partnered with the Public Health Law Center on many projects and value the Center staff's expertise as technical assistance providers. We welcome the opportunity to participate in this project in an advisory capacity and will assist with data gathering and dissemination, whenever possible.

Sincerely,



Dr. Brenda Cassellius
Commissioner, Minnesota Department of Education



Protecting, maintaining and improving the health of all Minnesotans

June 21, 2013

Health Impact Project
Pew Charitable Trusts
901 E Street NW, 10th Floor
Washington, DC, 20004

Public Health Law Center Proposal: Incorporating Health in School Construction Projects

Dear HIA Selection Committee:

I am pleased to write this letter of support on behalf of the Public Health Law Center's proposal to conduct a health impact assessment (HIA) on the Minnesota Department of Education (MDE) *Guide for Planning School Construction Projects in Minnesota*.

Minnesota's public health system – known as one of the best in the nation – is built upon a strong partnership between the Minnesota Department of Health (MDH), local public health agencies, tribal governments and a range of other organizations. The department's mission is to protect, maintain and improve the health of *all* Minnesotans. To this end, MDH is deeply committed to advancing statewide health improvements that focus on policy, environmental, and systems changes in communities. Advancing health in the K-12 school environment is a fundamental priority of MDH. As both educational environments and community gathering places, our public schools play an essential role in building and maintaining sustainable, healthy communities. We work closely with MDE and other state agencies on numerous school-related policies (e.g., transportation, nutrition, physical activity, school nursing, emergency assistance, wellness), many of which can be affected by school construction project decisions. We are particularly interested in addressing the health impacts of these decision-making processes.

Since 2003, when the *Guide* was last revised, several pieces of federal and state public health legislation have been enacted that have at their heart improving access to and use of school sites to achieve academic success, but also community-wide health, safety, proper nutrition, and general well-being. The requested proposal would provide a valuable opportunity to fully consider the potential health impacts of state and local school siting decision-making processes. Furthermore, the resulting report and recommendations could be used immediately, having a direct effect on both state and local decision-making processes and potentially leading to healthier decisions that could help to reduce disparities in access to and use of K-12 facilities and grounds. MDH and other state agency involvement in the HIA process will ensure that the project recommendations will be considered when the *Guide* is revised.

The Public Health Law Center has been a much-valued technical assistance provider in the implementation of many of statewide public health initiatives and is well-positioned to conduct this assessment. We look forward to participating in the project in an advisory capacity,

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MINNESOTA DEPARTMENT OF HEALTH (CONTINUED)

contributing our HIA expertise and experience to help facilitate the project's goals. This proposal provides a tremendous opportunity to improve our school environments to better support safe and healthy living for all, and we strongly encourage its approval.

Sincerely,

A handwritten signature in black ink, appearing to read "Edward P. Ehlinger". The signature is fluid and cursive, with a long horizontal stroke at the end.

Edward P. Ehlinger, MD, MSPH
Commissioner
P.O. Box 64975
St. Paul, MN 55164-0975

LOCAL PUBLIC HEALTH ASSOCIATION OF MINNESOTA



LOCAL PUBLIC HEALTH ASSOCIATION OF MINNESOTA

June 24, 2013

Health Impact Project
The Pew Charitable Trusts
901 E Street NW, 10th Floor
Washington, DC, 20004

Public Health Law Center Proposal: Incorporating Health in School Construction Projects

Dear members of the HIA Selection Committee:

On behalf of our members across the State of Minnesota, the Local Public Health Association (LPHA) is pleased to write this letter supporting the proposal of the Public Health Law Center at William Mitchell College of Law to conduct a health impact assessment on the "Guide for Planning School Construction Projects in Minnesota." LPHA works to achieve a strong public health system through leadership and collective advocacy on behalf of the public health professionals of Minnesota's city, county, and tribal governments. Our organization is dedicated to providing leadership on local governmental public health issues that have regional and statewide impact to ensure that all Minnesotans have a healthy and safe environment in which to live.

LPHA members work closely with school districts and non-profit community organizations throughout the state to advance public health priorities. In recent years, we have partnered with public schools on a number of initiatives, many of which have been funded through Minnesota's comprehensive Statewide Health Improvement Program (SHIP), other statewide programs, and federal grants. These initiatives are addressing the current childhood obesity epidemic by improving school and community-specific food environments, expanding opportunities for physical activity at school sites, and promoting the shared use of school facilities and grounds for community-wide use. Recently enacted federal and state legislation (e.g., the Healthy, Hunger-Free Kids Act of 2010, Complete Streets, Safe Routes to School, and recess guidelines) are supporting these initiatives, as well.

This proposal will help us better identify and understand opportunities for addressing health impacts associated with school planning, siting, and construction processes. For example, we look forward to exploring ways to incorporate school- and community-wide public health priorities while also expanding community participation in the decision-making process. We anticipate that the HIA report and recommendations will be put to immediate use and that, over time, new practices will lead to healthier decisions and the reduction of disparities in access to and use of school facilities across Minnesota. For these reasons, we look forward to participating in the HIA project and doing what we can to ensure that public health perspectives become an active, integral part of local planning and decision-making.

The Public Health Law Center has been a great partner, working with us at the organizational level and on many local initiatives. Thank you for the opportunity to submit this letter on their behalf.

Sincerely,

Gretchen Musicant, Chair
Local Public Health Association of Minnesota
City of Minneapolis Health Commissioner



Heart Disease and Stroke. You're the Cure.

June 24, 2013

Health Impact Project
The Pew Charitable Trusts
901 E Street NW, 10th Floor
Washington, DC, 20004

Re: Public Health Law Center – Incorporating Health in School Construction Projects

Dear HIA Selection Committee members:

As chair of the Minnesota Healthy Kids Coalition, I am pleased to write this letter of support on behalf of the Public Health Law Center's proposal to conduct a health impact assessment (HIA) on the **MDE Guide for Planning School Construction Projects in Minnesota**. The Minnesota Healthy Kids Coalition addresses childhood obesity through local, state, and federal policy. The Coalition is comprised of 24 member organizations; several other organizations and agencies participate but are not formal members.

In its role as a technical assistance provider, the Public Health Law Center assists the Coalition by providing research, policy analysis, sample policy language, and strategic guidance. Ms. Weisman has worked closely with the Coalition for several years, often assisting with the exploration and prioritization of new policy pathways such as the topic addressed in this proposal. For the past few years, I have worked collaboratively with Ms. Weisman on multiple childhood obesity projects, including the Childhood Obesity Legislative Working Group, a bipartisan group of Minnesota legislators, academic researchers, and non-profit community leaders that meets a few times each year to share research-based findings and discuss policy implications and opportunities. We currently serve as co-investigators on an evidence translation study led by University of Minnesota School of Public Health researchers, Drs. Sarah Gollust and Marilyn S. Nanney. From these experiences, I am confident that Ms. Weisman and her colleague, Mr. Kelly, will excel as leaders of this HIA project, and I have no doubt that they will be successful in engaging diverse stakeholders to ensure that the HIA reflects the diverse needs and interests of all Minnesota families.

The Coalition is eager to see this HIA proposal move forward because we believe the process and outcomes would have a long-term impact on local school district decisions that affect many issues we champion including Complete Streets, Safe Routes to Schools, Coordinated School Health, school nutrition policies, recess guidelines, active school days, shared/community use of school sites, wellness policies, and afterschool policies. The genesis of this proposal, in fact, stemmed from a Coalition discussion about potential opportunities for expanding the use of HIA to address childhood obesity issues.

In sum, the Coalition strongly supports this proposal, and we urge you to select it. Thank you for this opportunity to comment and voice support.

Sincerely,

A handwritten signature in cursive script that reads "Rachel Callanan".

Rachel Callanan, JD MNM
Regional Vice President of Advocacy, Minnesota & Wisconsin
American Heart Association, Midwest Affiliate

American Heart Association • MN Advocacy Department • 4701 West 77th Street • Edina, MN 55435
Phone: (952) 835-3300 • www.heart.org/mnadvocacy

Minnesotans for Healthy Kids Coalition Members June 2013

1. Allina Health
2. American Cancer Society
3. American Heart Association
4. Better Living Exercise and Nutrition Daily (BLEND) – CentraCare Health Foundation
5. Children’s Hospitals and Clinics of MN
6. HealthPartners
7. Minnesota Academy Nutrition and Dietetics
8. Minnesota Alliance for Health Physical Education, Recreation and Dance (MN-AHPERD)
9. Minnesota Alliance of Boys and Girls Clubs
10. Minnesota Association of Family and Consumer Sciences (MAFCS)
11. Minnesota Chapter of Action for Healthy Kids
12. Minnesota Chapter of the American Academy of Pediatrics
13. Minnesota Council of Health Plans
14. Minnesota Local Public Health Association
15. Minnesota Medical Association
16. Minnesota PTA
17. Minnesota Public Health Association
18. Minnesota School Nutrition Association
19. Playworks Twin Cities
20. St. Paul - Ramsey County Public Health
21. Twin Cities Medical Society
22. U of MN, Program in Health Disparities Research
23. YMCA State Alliance
24. Youth Determined to Succeed



SCHOOL OF ENVIRONMENTAL STUDIES An Optional H.S. in School District 196

12155 JOHNNY CAKE RIDGE ROAD
APPLE VALLEY, MN 55124
PHONE (952) 431-8750
FAX (952) 431-8755

DAN A. BODETTE
PRINCIPAL



Red Pine Elementary School
A Minnesota School of Excellence
530 Red Pine Lane
Eagan, MN 55123
Phone 651-423-7870

Gary D. Anger, Principal

"Red Pine Elementary School . . . A Quest for the Best!"

June 24, 2013

Health Impact Project
The Pew Charitable Trusts
901 E Street NW, 10th Floor
Washington, DC, 20004

Public Health Law Center Proposal: Incorporating Health in School Construction Projects

Dear Selection Committee:

With great interest, we, the undersigned administration of Independent School District 196 (ISD #196), are pleased to write this letter of support on behalf of the Public Health Law Center and its proposal to conduct a health impact assessment (HIA) on the *Guide for Planning School Construction Projects in Minnesota*.

Advancing health within the K-12 school environment is a priority in ISD #196. Our schools function as both educational environments and recreational settings, serving an essential role in building and maintaining sustainable, healthy communities. We work closely with the Minnesota Department of Health (MDH), Minnesota Department of Education (MDE) and other public and private partners on a number of health-related initiatives. As educators and administrators, we are particularly interested in identifying and addressing the health impacts of the decisions that we are making.

Since the *Guide for Planning School Construction* was last revised, local school districts have been engaged in a number of initiatives within our school settings that have not only improved academic and behavioral success, but also the health, safety, and general well-being of our students, as well as our communities at-large. This proposal will provide us with the opportunity to better understand the health impacts of the school planning, siting, and construction processes. The resulting report and recommendations will be used by local school leaders immediately, directly affecting our decision-making processes and leading to healthier decisions that could help to reduce disparities in access to and use of K-12 facilities and grounds. Through participation in the HIA, local leaders will help ensure that the project recommendations are considered when the *Guide* is revised and put into use in the interim.



Educating our students to reach their full potential
Serving all or part of Rosemount, Apple Valley, Eagan, Burnsville, Coates,
Inver Grove Heights, Lakeville, and Empire and Vermillion Townships

SCHOOL OF ENVIRONMENTAL STUDIES An Optional H.S. in School District 196

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PHONE (952) 431-8750
FAX (952) 431-8755

DAN A. BODETTE
PRINCIPAL



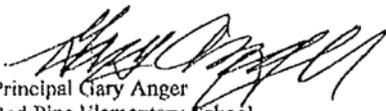
Red Pine Elementary School
A Minnesota School of Excellence
530 Red Pine Lane
Eagan, MN 55123
Phone 651-423-7870

Gary D. Anger, Principal

"Red Pine Elementary School . . . A Quest for the Best!"

Many school districts, like ours, have worked with the Public Health Law Center on a variety of initiatives and their work is well-respected. We look forward to assisting them with this innovative project by providing our experience and expertise to help facilitate the project's goals, as needed. This proposal provides a great opportunity to continue our work and improve our school environments to better support safe and healthy living for all.

Respectfully,


Principal Gary Anger
Red Pine Elementary School
530 Red Pine Lane
Eagan, MN 55123


Principal Dan Bodette
School of Environmental Studies
12155 Johnny Cake Road
Apple Valley, MN 55124

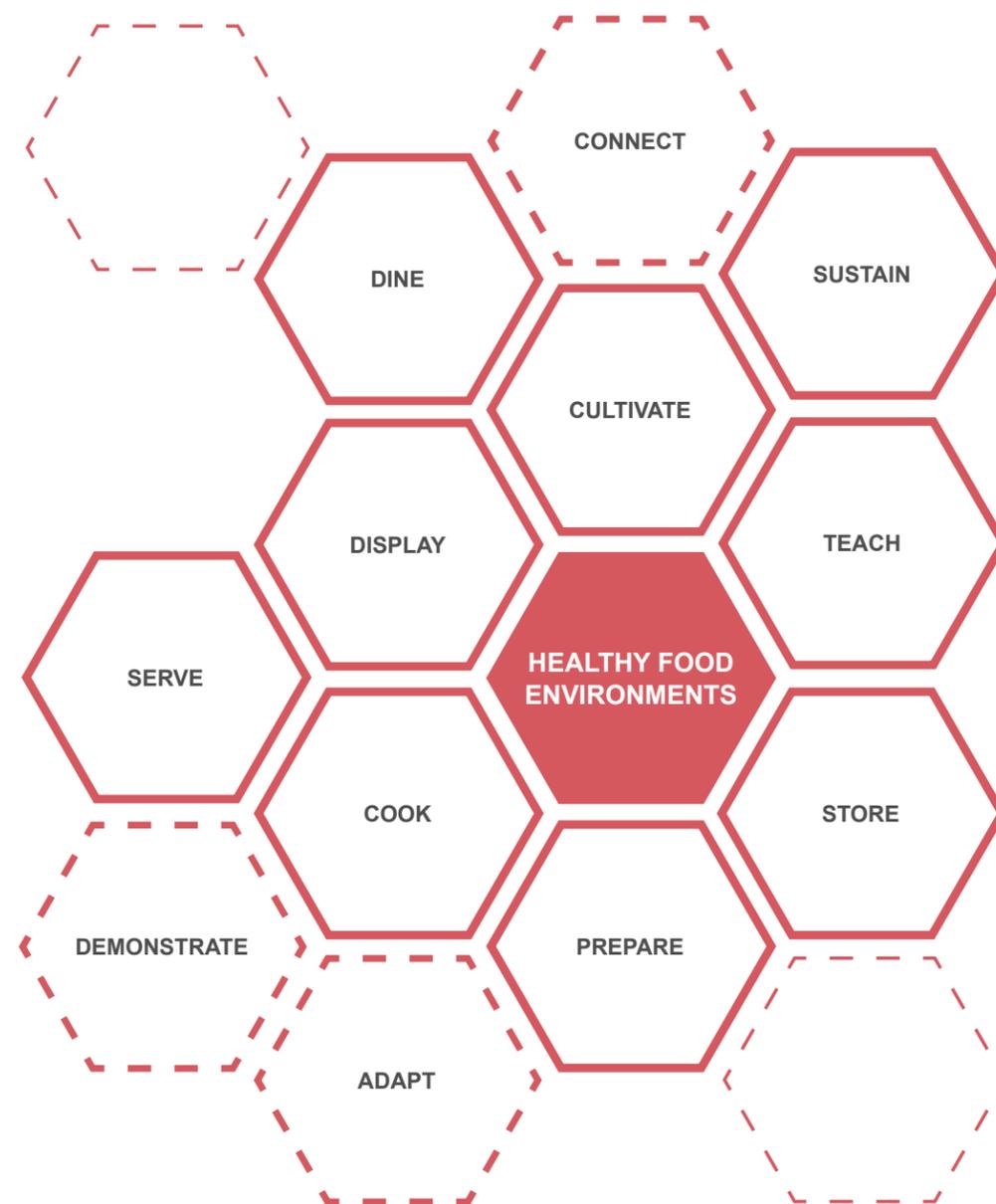


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Inver Grove Heights, Lakeville, and Empire and Vermillion Townships

Appendix VII: Illustrative Exhibit, Food Environment

Created by VMDO Architects, in partnership with Reitano Design Group and the Public Health Law Center for the Public Health Law Center's Health Impact Assessment project, *Building Healthy Schools* (January, 2015), with support from The Health Impact Project, a collaboration between The Pew Charitable Trusts and the Robert Wood Johnson Foundation, with additional funds provided by the Blue Cross and Blue Shield of Minnesota Foundation.

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HEALTHY FOOD ENVIRONMENT FACTORS

CONNECT.

Making a strong connection to the story of fresh food relies on creating a connection to the harvesting, preparation and serving experience. School dining experiences that physically and programmatically connect students to the origins of food promote awareness of healthy food policies and practices. Shifting school design toward a health paradigm benefits most from a holistic approach that includes kitchen operations, equipment, standards and regulations, and leadership by nutrition experts and menu planners with deep knowledge of school food policies as well as educators, designers and public health experts.

Striving to create a less institutionalized mealtime experience while also balancing service and educational schedules requires careful planning. To be effective, such planning demands cross-disciplinary collaboration with faculty, staff, and community members to maintain the all-important focus on the student experience.

KITCHEN MODELS.

When considering types of kitchens, the operational model needs to include the transportation of food to-and-from vendors or transport from a *centralized kitchen* serving multiple schools. Potential reductions in serving space directly connected to the kitchen could be warranted in the centralized kitchen scenario.

Should a *demonstration kitchen* be a goal, combining this model with a traditional serving line would be a key connection to maximize. Allowing space for food demonstration and audience participation and interaction would be the focus of such a model. Versatile designs that allow for different types of cooking apparatus are also important.

A *teaching kitchen* for student and community use should be outfitted with residential-style cooking appliances and 21st century teaching tools. Locating a teaching kitchen/culinary arts classroom close to the full service school kitchen promotes cross-programming and allows for sharing of resources and staff expertise.

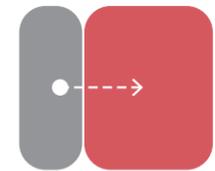
The student experience is a top priority and requires very careful consideration when it comes to serving and dining styles. Serving styles range from a traditional line [minimum of one serving line per 100 students served per lunch] to family style and a la carte options. Planning for and determining what is best for each school, based on grade level and/or ages of the student population, should include consideration of cross-disciplinary knowledge of food service operations, educational concepts and socialization theories.





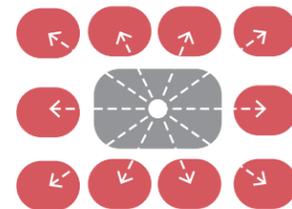
SCHOOL GROUNDS AS COMMUNITY ASSET

**TRADITIONAL CAFETERIA
KITCHEN → DINING MODEL**

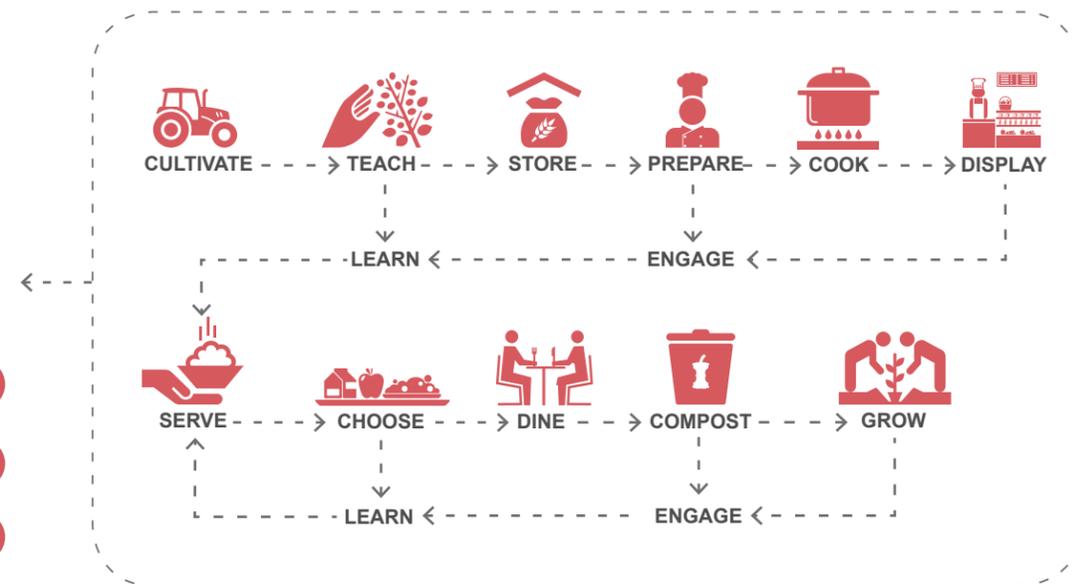


CENTRALIZED DINING

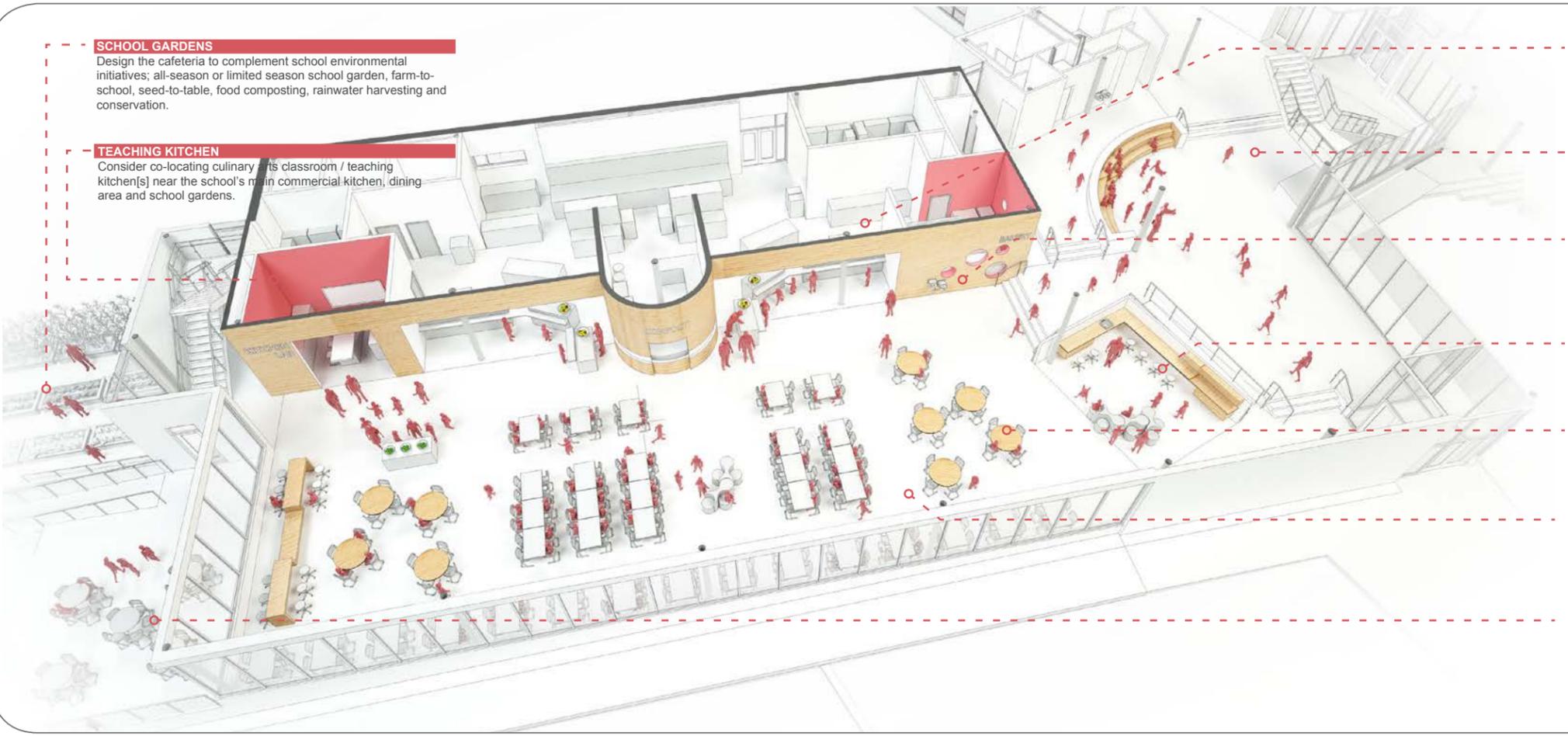
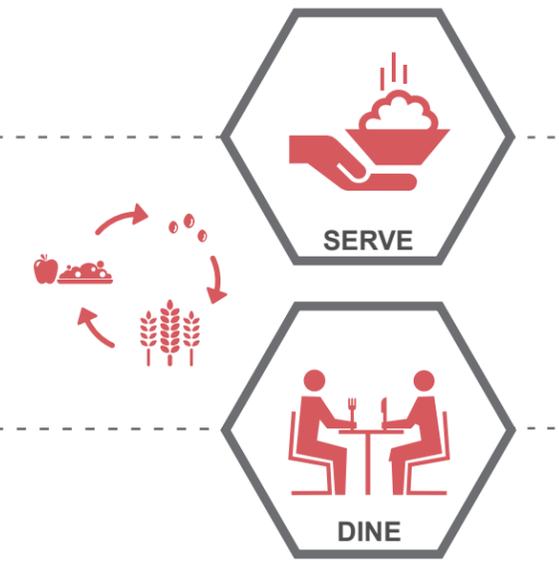
**LEARNING ENVIRONMENT
KITCHEN → DINING MODEL**



DECENTRALIZED DINING



DINING ↔ SERVING FEEDBACK LOOP



SCHOOL GARDENS
Design the cafeteria to complement school environmental initiatives; all-season or limited season school garden, farm-to-school, seed-to-table, food composting, rainwater harvesting and conservation.

TEACHING KITCHEN
Consider co-locating culinary arts classroom / teaching kitchen[s] near the school's main commercial kitchen, dining area and school gardens.

OPEN KITCHEN + MOBILE SERVING EQUIP
Celebrate scratch cooking and fresh food prep by making food service activities visible to students with an open kitchen and flexible serving equipment that allows for serving style modifications and innovative changes over time.

GATHERING SPACE
Design cafeteria as a gathering space that supports multi-use and complementary programming and shared use by community members. Include AV projection technology to support a variety of student and community programs.

FRESH DRINKING WATER ACCESS
Provide access to fresh drinking water for students and community at no charge at all times.

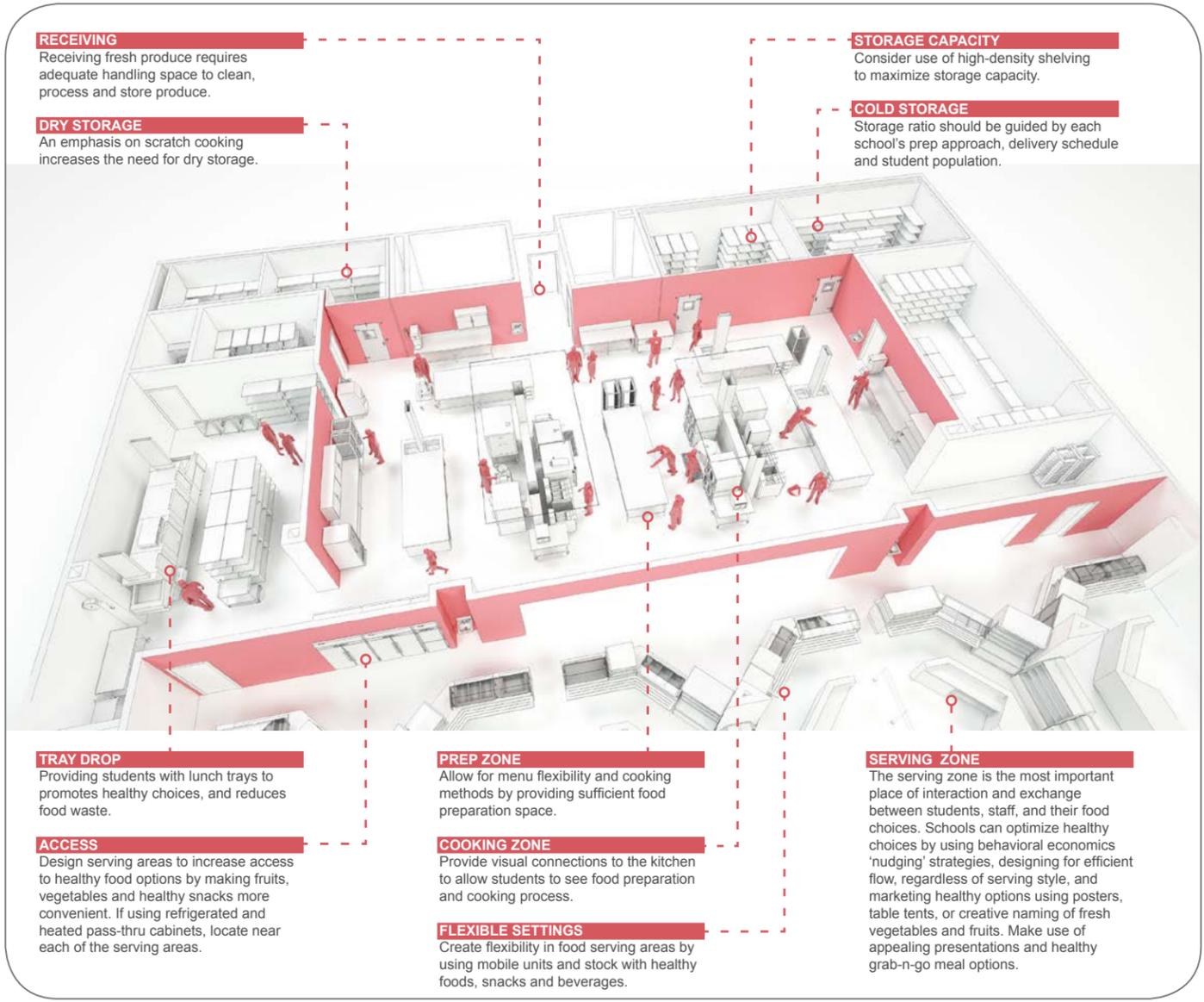
FOOD LAB | SMALL GROUP LEARNING
Consider outfitting small group food-based learning settings to support nutrition instruction, hands-on, student-centered, food and garden projects, and curricular resources for teachers and staff.

PLEASURABLE DINING COMMONS
Design the food experience as a place of pleasure and relaxation. Provide a variety of flexible, comfortable furniture, proper acoustics, ample daylighting, and connections to nature and the outdoors.

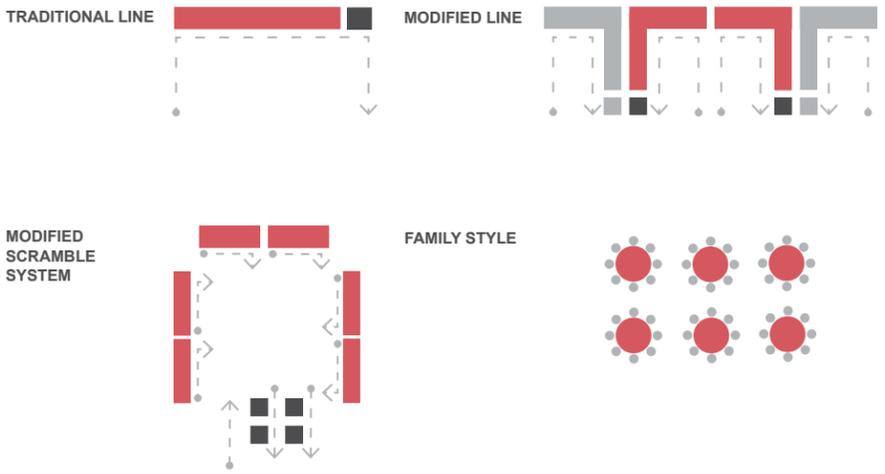
FLEXIBLE SETTINGS
Provide adequate space for a variety of furniture options that encourage smaller groupings, dining clusters, and perimeter seating. Allow space for mobile food service equipment such as salad bars, demonstration labs, and tastings.

OUTDOOR DINING | CLASSROOM
Consider designing a variety of covered outdoor settings adjacent to the cafeteria and within easy access to one or more outdoor physical activity areas.

DINING EXPERIENCE PLANNING PRINCIPLES



SERVING STYLES



SERVE

KITCHEN DESIGN PLANNING PRINCIPLES

- CULTIVATE. RECEIVING FRESH PRODUCE.**
Farm-to-Schools programs and school gardens are great ways to engage local growers and students in a healthy food-centered dining program. Receiving fresh produce requires adequate space for storing, cleaning, and prepping produce. Whether the fresh produce arrives from a local source, school garden, or commodity order, the handling process will not change. Consider placing a processing area near the receiving area if fresh produce items harvested from school gardens are included in the school breakfast or lunch program.
- TEACH. EVALUATING FRESH FOOD ENVIRONMENTS.**
Encourage expansion of means and methods for certifying, implementing, and monitoring local Farm-to-School and/or Farm-to-Table distribution. To complement local, fresh food procurement practices, schools should consider educational programming opportunities that encourage teachers, students and families to participate in healthy, food-centered dining. Engaging with the local 4H, Ag in the Classroom, Know-Your-Farmer/Know-Your-Food or other curricular-rich food resources links health promoting practices to everyday dining experiences.
- STORE. SUPPORTING HEALTHY FOOD ACCESS.**
An increased emphasis on scratch-cooking changes the allocation of space for dry, refrigerated and freezer storage. Planning for 50% kitchen space and 50% storage space, coupled with use of high density shelving, will increase storage capacity by 40-50% without increasing overall square footage. Providing adequate storage for fresh fruits and vegetables from a variety of vendors will allow food service directors to implement healthy food practices.
- PREPARE. OPTIMIZING PREP SPACE.**
Prep spaces should allow for easy access to stored products and equally easy processing at the cooking center. Planning for scratch cooking meal preparation requires positioning the cooking center to act as a thoroughfare from storage/prep to transition/serving. In an open kitchen, positioning the cooking center perpendicular to the storage and serving will maximize space for prep tasks and makes cooking visible to students. Increasing the amounts of fresh produce will also increase the importance of having appropriate prep sinks.
- COOK. MAKING TASTY FOOD A DELIGHT TO EAT.**
An array of cooking equipment needs to be considered if planning for scratch cooking and cooking with fresh ingredients. There may be a need for more open burners to allow for sauteing and seasoning preparation. Versatile vessels for steaming and cooking fresh produce will be key pieces of equipment. Fast cooling and freezing equipment such as a blast chiller will also be important for delivery and storage of fresh produce.
- DISPLAY. COMMUNICATING HEALTHY FOOD.**
The placement and display of healthy foods is a very important feature when designing for healthy choice and healthy consumption. Designing healthy 'convenience' lines, providing access to fresh water, using attractive and age-appropriate nutrient signage, and visual displays should be emphasized to have a positive impact on students' choices. Consider opportunities for students to learn about their healthy food preferences, participate in tastings, and encourage smart influences on healthy menu planning.





Public Health
Law Center

AT WILLIAM MITCHELL COLLEGE OF LAW

PUBLIC HEALTH LAW CENTER

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