WAUWATOSA SCHOOL DISTRICT

ANALYSIS OF LEARNING SPACES REPORT

April 2025

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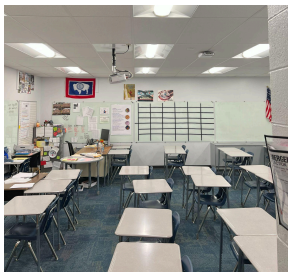
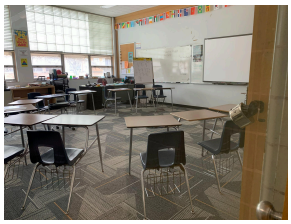
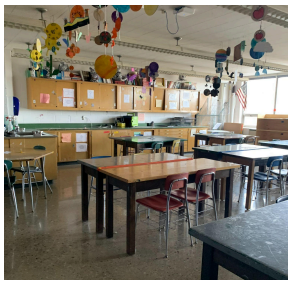
			

Introduction

The first two decades of the 21st century have seen significant changes to instructional approaches and programming in schools. During this same time period 54% of K-12 school districts in the nation have come due for replacement of multiple building systems, with an estimated one-third of schools needing HVAC system updates (Alexander & Lewis, 2014; United States Government Accountability Office, 2020).

Filardo et al. (2019) identify that the average public school building in the United States (US) was built around 1968. Alexander and Lewis (2014) further go on to state that the National Center for Education Statistics reports that half of all public schools in the US need at least one major facility repair. Despite this need, many schools in the US lack funding to renovate or modernize their facilities. Filardo (2016) cites the State of Our Schools 2016 report which notes that there is a $38-billion-per-year shortfall on capital investments for public schools in the country and an additional $8 billion gap in maintenance and operations. Leachman (2018) notes that the spending gap has worsened and that state and local governments have cut funding for capital improvements in public schools nationally by nearly $21 billion (or 26%) from 2008 to 2016.

When school districts begin to face budget shortfalls, the first thing that tends to be cut or reduced are building maintenance budgets. Therefore, the argument has

been made that building quality may be less about age and more about budget strength (Schneider, 2002). Furthermore, Baker (2019) posits that facilities and infrastructure investments have both direct and indirect influence on student outcomes. Therefore, it is clear that there are urgent needs for maintenance and renovations to existing schools across the country. In some cases, construction of new buildings is necessary to address these maintenance issues and improve spaces to meet modern programming and instructional approaches.

When it comes to Wauwatosa, in particular, one of the unique charms of the schools within the Wauwatosa School District (WSD) is their vintage and beautiful architecture. In fact, Wauwatosa's first high school opened in 1871 on the same site as the present Wauwatosa East High School. (City of Wauwatosa - Encyclopedia of Milwaukee). The craftsmanship and mystique of the District's facilities are part of the school concept, and the history of the buildings is linked to the community's lineage.

As part of long-range facilities planning, it is important to question whether the vintage of buildings and their features are imposing constraints on the range of educational experiences and opportunities available to students both in programmatic and service offerings. Are the daily instructional experiences teachers can implement in classrooms in line with evidence-based practice and curriculum guidelines?

Beginning in the 2015-16 school year, the Wauwatosa School District began the process of examining its buildings and grounds both through a comprehensive facilities condition assessment (FCA) and by reviewing the educational space adequacy (ESA) of each school building to commence long-range facilities planning. This approach allowed the district to carefully consider not just maintenance needs but also the enrollment, capacity, and general improvements that could impact the learning environment of each school. The findings from these studies prompted the District to take action by forming a Community Task Force. This task force was responsible for evaluating the needs of the schools and making recommendations based on their findings. After thorough discussion and analysis, the task force advised the Board of Education to propose a referendum question for the November 2018 ballot. The proposed referendum sought $124.9 million in funding for several significant improvements, including the construction of four model elementary buildings—Lincoln, McKinley, Underwood, and Wilson/WSTEM. Additionally, the funds would be used for crucial safety and security upgrades, building maintenance, and improvements to HVAC systems. The plan also included classroom updates, enhancements to Technical Education labs, and necessary ADA accessibility upgrades to ensure compliance and accessibility for all students. With a successful referendum, the community recognized that while many of the District's buildings

do have uniquenesses and charms reminiscent of bygone eras, a number of spaces were not suited for the District's current and envisioned programming.

Since the completion of the 2018 referendum projects, the District has continued to regularly update the maintenance list as items come due or are completed. Additionally, the District has updated the ESA assessment to account for the updates completed since the 2018 referendum projects, changes in student enrollment, and the review and refinement of District programs and services.

As the next phase of long-range facilities planning was undertaken during the 2022-23 school year, WSD leaders sought to update the ESA which was was calculated for each school building using three industry-accepted methods (Castaldi, 1994; Minnesota Department of Education, 2018; Wauwatosa School District Long-Range Facilities Plan, May 2024, pp. 55-64). These calculations were leveraged to model various potential District grade range configurations and resulting building capacities:

- Capacity by desired class size;
- Capacity by learning environment area; and
- Capacity by gross building area.

While having these calculations is foundational to determining ESA, traditional ESA analysis is reliant in large part on mathematical means derived from the master schedule, District class size policy, and room/building square footage. Traditional ESA does not go far enough to describe the actual adequacy of the learning spaces within a building, nor does it describe the totality of the building's spaces to support the myriad functions and programmatic demands within its walls and on its property each day. In other words, ESA is not just about having adequate capacity. It must also address whether the space is suited for the programming scheduled within it now, and the envisioned changing needs of these programs over time. These facets of teaching and learning include, but are not limited to, space for resources, instructional strategies that involve movement and classroom flexibility, and safe storage.

Beginning in December 2023 leaders from the WSD and Plunkett Raysich Architects (PRA) began reviewing the District's Strategic Plan (specifically objectives 1s, 2.6, 3.1, 3.5, 3.6, 5.6, 6.1, 6.2). Recent comprehensive curriculum and programmatic review recommendations were also reviewed. From this initial review and research it was decided to embark on a comprehensive analysis of secondary learning spaces, anchored in the work of Basil Castaldi - the foremost recognized expert in the field of educational architecture. Castaldi (1994) suggests that school districts should engage in a "comprehensive expert study of the educational program offered by the school district" (p. 73). Such a study shall analyze specific educational goals of the district

and “covers all of the instructional experiences that pupils undergo in a school” (Castaldi, 1994, p. 73). This includes instructional materials, methodology and techniques needed for each program and class, and is coupled with foreseeable changes to these in the future. Further anchoring the expertise of Castaldi, such a study, “is designed to discover and identify shortcomings in the educational program and to include suggestions that will overcome such deficiencies” (Castaldi, 1994, p. 73). Therefore, this analysis is positioned to do just this.

Moreover, with this direction determined, the following essential questions were developed to guide the analysis of learning spaces.

1. How does the current space available in secondary schools, and configuration thereof, allow for full programmatic/service offerings for students?

2. To what extent is the student experience similar across both middle and both high schools?

3. How does the space available within the secondary buildings and individual classrooms allow for the full implementation of approved curriculum and programming within research-based impactful practices for:
    a. Instruction;
    b. Safe and effective use of resources, materials, supplies and technology,
    c. Assessments in varied formats;
    d. Intervention and extension spaces to intervene and extend with students with fidelity. This includes the areas to work with students and storage of materials for this purpose; and
    e. Professional learning and collaboration spaces – spaces needed for training to implement curriculum/programming as intended.

As a result of the review of District plans and goals, needed next steps in programmatic areas, and relevant research, the creation of 15 customized rubrics were developed. These rubrics were developed by program area (e.g. mathematics, visual arts). A rubric was also developed for the overall building. These rubrics would later be utilized in the study to accomplish what Castaldi (1994) advises, “*to discover and identify shortcomings in the educational program and to include suggestions that will overcome such deficiencies* [emphasis added]” (p.73). **Said differently, in pursuit of the District's vision - (1) to ensure an exceptional student experience, (2) to eradicate inequity, (3) to eliminate disproportionality, and (4) to exceed proficiency for all - the purpose of this study and this subsequent report is to provide a comprehensive analysis of learning spaces in regards to the instructional functionality of existing classroom spaces. Additionally, the study**

provides analysis of the common spaces within the overall building. An Executive Summary can be found in Appendix A.

Literature Review

Introduction

When it comes to improving student learning outcomes, the holistic design functionality of the school itself is not always readily considered to be a prominent barrier to such improvement efforts. Barrett et al. (2019) state, "*the learning environment works as a third teacher* [emphasis added] only after the teacher-learner and learner-learner interactions" (p. 35). As such, it is imperative that improvement in school facilities share equal importance with other aspects such as updated curricular resources and improvements in educator pedagogy. For it is the design and layout of our instructional spaces that to a large degree impact the curricular resources and pedagogy that can be leveraged between teachers and students.

General Features of Quality K-12 Educational Facilities

The literature elevates the following eight elements of buildings as both mission critical and transcendent of programmatic area in creating high quality learning environments:

- Acoustics;
- Building layout, classroom size and furnishings;
- Electrical power in classrooms;
- Lighting;
- Indoor air quality;
- Thermal comfort;
- Safety Features; and
- Overall aesthetics and building quality (Barrett, et al., 2015; Cash, 1993; Cupolo, 2024; Earthman & Lemasters, 1996; Evans & Maxwell, 1997; Gao & Lafortune, 2020; Haines, et al., 2001; Heschong Mahone Group, 1999; Lemasters, 1997; Schneider, 2002; Tanner, 2000; Texas Association of School Boards, 2024; Uline & Tschannen-Moran, 2008; Wurtman, 1975).

What follows is a comprehensive look at what the literature says about each of these items and its impact on teaching and learning.

Acoustics

The acoustics of an instructional space impact student learning outcomes. Schneider (2002) shares that “good acoustics are fundamental to good academic performance” (p. 6). It has been further identified that a common source of noise pollution in a classroom is rooted in heating and cooling systems, many of which will exceed the noise standards set by the Acoustical Society of America's maximum of 35 decibels and .6 to .7 reverberation for unoccupied classrooms (Schneider, 2002).

In fact, “many classrooms feature a speech intelligibility rating of 75% or less. That means listeners with normal hearing can understand only 75% of the words read from a list” (Cannon Design, et al., 2010, p. 27). Compounding this is current research showing that mild hearing loss is present in 2 to 3 of every 1,000 children born in the United States (Young, 2023). Additionally relevant is the research Sutherland and Lubman (2001) presented linking train and freeway noise to lesser academic achievement than those students in ‘quiet’ classrooms on opposite sides of the building from these sources of noise. They also posit that the average voice level for a teacher in these environments would need to be 10dB above their average level in a ‘quiet’ setting. Nearly 600,000 teachers miss at least one day of work per year because of voice issues which reminds the reader that this level of projection unaided is unsustainable without significant vocal strain (Young, 2023).

Furthermore, noise levels cause stress, influence verbal interactions, reading comprehension, blood pressure, and cognitive tasks. Additionally, noise levels perpetuate feelings of helplessness, concentration and persistence on tasks (Evans & Maxwell, 1997 & Haines et al., 2001). Soft seating, furnishing selection, and location can assist with this (Cannon Design et al., 2010). Furthermore, Paoletti (2006) explains that for every education project, “basic criteria and principles have an acoustical impact and should be considered for every educational project. These include the following:

- Good clear and intelligible speech communication (via natural projection and electronically);
- Projection of preprogrammed audio (and video) via sound, audiovisual, multimedia, and technology systems;
- The ability to hear all spoken communications (lecture rooms, classrooms, auditoria, etc.);
- Control of unwanted noise and vibration from a building’s HVAC system, ductwork distribution, electrical, and plumbing systems;

- Design of the interior quality of the acoustic environment;
- Assessment and control of unwanted exterior environmental noises (e.g. vehicular traffic, aircraft flyovers, mechanical equipment, industrial facilities, etc.);
- Special design of the acoustic environment for critical listening spaces (e.g. auditoria, theatres, studios, distance learning, multipurpose spaces, etc.);
- Materials selected for the space should be mindful of acoustic goals and assist with reverberation control" (para, 2).

Building Layout, Classroom Size, and Furnishings

When considering classroom size, Barrett et al. (2019) consider the classroom characteristic of "individualization". Individualization is made up of three different design parameters - ownership, flexibility, and connection. Ownership is in reference to personalized displays and high-quality furniture to foster ownership amidst students. Flexibility is defined as large simple areas with easy access to attached break-out spaces and widened building corridors for students' storage that also include well-defined learning zones and wall areas for display.

The Texas Association of School Boards (2024) also comments on space flexibility noting that there should be enough space to allow teachers to flexibly arrange student seating in a classroom allowing for a myriad of teaching methods to be employed. Furthermore, when adequate space in classrooms is available it allows for there to be varied learning areas for students to support not only large group instruction, but also individual and small group instruction.

Finally, connection is defined as, "wide corridors with external views where possible, plus distinctive, orientating features, especially in relation to the doorways of particular classrooms. Circulation spaces should be large enough to use for educational activities, such as 'corridor libraries'" (Barrett et al., 2019, p. 28). In other words, classrooms that allow for flexibility and reconfiguration have been associated with increased engagement and learning because it supports students working together, collaborating, and communicating effectively to solve novel problems. Furthermore, one of the core responsibilities of teachers in their daily instructional practice is checking in on student learning (James-Ward et al., 2013). One way in which impactful educators do this is by circulating the classroom as students are working in small groups or as they are engaged in individual practice. In other words, it is imperative for there to be ample space in the classroom for educators and students to access one another with clear site lines for staff to supervise students (Evertson & Emmer, 2009).

However, the creation of flexible spaces can have unintended consequences as found in a Norwegian study where the degree of flexibility designed in the spaces actually created a low level of stimulation and lack of ownership of the users of the space (Barrett & Barrett, 2016). Barrett et al. (2019) underscore that there is a design distinction between “open” and “flexible” and they should not be thought of as one in the same. As cited in Barrett et al. (2019), Atkin (2011) states that it is important to, "move beyond the simplicity of flexible open spaces to integrate resource rich, special purpose spaces with flexible, adaptable multipurpose spaces to provide a dynamic workshop environment for learning” (p. 36).

Conversely when there is a lack of overall square footage in a classroom, said classroom easily becomes overcrowded. Overcrowding has also been associated with increased student aggression, decreased engagement and concentration, limited innovation, variance in teacher instructional techniques, and teacher burnout (Rivera-Batiz & Marti, 1995; Texas Association of School Boards, 2024). Moreover, in crowded classrooms opportunities for targeted student-teacher contact about an individual student’s learning progress is limited (Rivera-Batiz & Marti, 1995). According to Duncanson (2014), the simple addition of more physical space promotes active learning as well as cleaner organization and fewer distractions. Furthermore, he found that extra space led to higher test scores in science and language arts.

Uline and Tschannen-Moran (2008) posit that design features that make for flexible and responsive environments foster a sense of comfort for those that engage in teaching and learning within the space. They further note that when students feel comfortable because there is enough space for them to move freely within and beyond individual classrooms in a school, the likelihood of there being strong student engagement, agency, and collaboration increases. Additionally, these same authors caution those in charge of designing learning spaces to pay attention to the way in which they encourage or impede daily interactions between students and teachers. Again, it is imperative for there to be ample space in the classroom for educators and students to access one another (Evertson & Emmer, 2009).

Furthermore, Nair (2014) reminds us that furnishings do matter. More traditional classrooms allow for desks and rows of students to read quietly at their desks. In fact, a passerby might see students doing so and think of this as a well-managed classroom wherein students are learning independently. However, how many individuals would choose traditional desks and chairs to sit and read in by choice? As previously mentioned, giving students increased ability to move while seated–rocking, swiveling, and rolling–triggered far-above-average levels of concentration during test taking (Cannon Design et al., 2010). Student-centered

learning requires classrooms to have some degree of flexibility and provide 'ownership' of space and equipment by both teachers and students.

Electrical Power in Classrooms

With contemporary education focused on student-centered learning, so true is the increased incorporation of instructional technology as a supportive, and oftentimes, as a collaborative learning tool. Crompton and Burke (2024) write about the nexus between academic progress and the standards of The International Society for Technology in Education (ISTSE) which are the educational industry's standards to guide educational technology innovation. They state, "technology has become commonplace in K-12 classrooms with students actively using digital technology to support learning" (p. 711). As a result, student access to instructional technology at the secondary level is ever evolving, including student 1:1 access to a personal digital device such as a laptop (Cupolo, 2024). This author goes on to further say that as a result of greater access to technology so comes the need for greater access to power sources within classrooms.

Despite this need, Gao and Lafortune (2020) highlight that 70% of schools are more than 25 years old, thus these spaces have not been designed to support the power needs of laptops, mobile devices, or internet connectivity. Therefore, from an electrical power access perspective, if a school is of a vintage age, there is a high degree of confidence that the electrical needs in a classroom far surpass what is actually available. This greater demand than supply then presents complications in the actual learning environment in a variety of ways. One being students missing out on their learning because they are unable to access a charged device or are unable to properly charge their device. As technology drains through the school day, this can be exponentially more problematic during the final hours of the school day. A remedy that is often used to increase access to power sources for students is through the implementation of power cords which allow multiple devices to be connected to a power source at the same time. The unintended consequence with this leads to classroom circulation complications due to the creation of tripping hazards from the loose laptop and power cords that lay around the classroom floors. These 'daisy-chained' cords can also overload the existing power supply and create electrical safety hazards.

In addition to the challenges of managing mobile devices, is the reliance on digital displays in classrooms as well as instruments and tools for science, technology education, and family and consumer science courses, in particular. In addition to having power, care must be taken to ensure the placement of the power so that

instrument, tool, and equipment cords are not near water, heat sources, or other potential hazards.

Furthermore, electrical power can also be tied to accessibility for students when there are wheelchair or other medical devices needed for a child's full inclusion and participation in the classroom setting. Ensuring classrooms have adequate electrical power supply and distribution of outlets throughout the learning spaces ensures full access to programmatic implementation for all students.

Lighting

Lighting has also been found to impact student academic outcomes and reduce off-task behavior (Schneider, 2002). Furthermore, natural daylight, more so than any other form of lighting, has been associated with not only higher academic performance, but also better physical well-being (Heschong Mahone Group, 1999; Lemasters, 1997; Uncapher, 2016; Winterbottom & Wilkins, 2009; Wurtman, 1975). In fact, a study performed by the Heschong Mahone Group (1999) found that students with the most natural light in their classrooms progressed 20% faster in math and 26% faster in reading during the academic year than students who learned in classrooms that received the least amount of natural light. Students exposed to more natural light perform better than students who are not; however, as cited in Cheryan et al. (2014) the National Center for Education Statistics reports that 16% of schools with permanent buildings and 28% of schools with portable facilities have unsatisfactory natural lighting.

Lekan-Kehinde and Asojo (2021) remind us that making the most of natural light allows us greater energy efficiency; therefore, each interior space should be designed considering this. They go on to identify studies which have shown that light properties, illumination, and color temperature impact students' reading achievement.

Chauca et al. (2024) conducted a more specific study to examine the effects of light intensity and color temperature on cognitive functions. Their research found that light intensity values ranging between 350 and 1000 lux, along with color temperatures from 4000 to 5250 Kelvin, were particularly favorable for enhancing attention. Additionally, their analysis, which incorporated various parameters sensitive to lighting conditions as well as participant questionnaires, revealed that long-term memory reached its highest levels of measurement under these lighting conditions. Their conclusion is that an adequate light intensity and color temperature based on the greatest possible amount of natural light complemented with Light Emitting Diode (LED) light generates optimal lighting for the classroom, which also achieves energy efficiency while promoting student well-being and

performance. Additionally, lighting, whether natural or via classroom fixtures, must be considered in the context of other visual needs in the classroom so as to create ideal light levels but not create glare off of whiteboards, fixed digital displays, and other teaching surfaces. Lighting in classrooms must also allow for darkening for teaching and/or safety reasons as teachers do hold the basic expectation that they should be able to control light levels in their classrooms (Heschong, 2002).

In sum, attention to lighting values, temperatures, and placement coupled with controls for natural lighting are critical to overall classroom functionality.

Indoor Air Quality

In 2006, across all 50 states, 424 school districts representing nearly 1,000 elementary, middle, and high schools responded to questions about the management and monitoring of the inside school environment. The results indicated that only 35.4% of districts and 51.4% of schools had an indoor air quality management program; 35.3% of districts had a school bus engine-idling reduction program; most districts and schools had a policy or plan for how to use, label, store, dispose of, and reduce the use of hazardous materials; and 24.5% of states required districts or schools to follow an integrated pest management program (Jones et al., 2007). This is significant because as Breithecker points out (Cannon Design, et al., 2010), children' s organs are still developing and therefore their “brains and lungs are more vulnerable to permanent damage and chronic disease from toxins and particulates” (p. 36). Building materials, whether aesthetic, part of mechanical systems, or furnishings/educational materials, must be considered as children have higher metabolic rates than adults. Therefore, they breathe more air per pound of body weight than adults which means a higher risk of being impacted by poor indoor air quality than adults.

Furthermore, poor air quality is a contributing factor to student and staff absenteeism, in particular for those with asthma. Additionally, when a facility has been deemed to have poor air quality, this means that there is a greater presence of bacteria, viruses, allergens, and indoor pollutants (Texas Association of School Boards, 2024). One study has shown that after installing an electromagnetic air cleaner in classrooms, absenteeism dropped from 8.3% to 3.7%. After the air purifier was removed the absentee rate jumped back to 7.9% (Schneider, 2002). Additionally, poor air quality further means that there is a higher level of carbon dioxide which has been linked to lower abilities to concentrate (Barrett et al., 2019).

Studies have shown that numerous schools are located in areas with high levels of air pollutants (Chen et al., 2000; deGennaro et al., 2014; Ashmore & Dimitroulopoulou, 2009). The school's geographical location plays a significant role in formulating its

indoor and direct outdoor air quality. PM10 and total bacteria count levels for schools surrounded by roadways were found to be significantly lower than those surrounded by buildings and mountains (González-Martín et al., 2021). According to Sadrizadeh et al. (2022), demand-controlled ventilation, combined with an efficient air distribution system, could reduce the energy use required for mechanical ventilation and trigger the biggest saving while impacting the health and well-being of children in schools.

The United States Environmental Protection Agency (EPA) (2025) offers six technical solutions to common Indoor Air Quality (IAQ) issues in schools:

1. Provide Quality HVAC: This includes overall system design, operation and maintenance to allow for clean and healthy IAQ in schools to provide adequate outdoor ventilation, control odors and reduce pollutants.
2. Mold and Moisture Control: Monitor moisture and establish mold inspection and remediation plans, with proper equipment for cleaning and drying affected areas promptly.
3. Integrated Pest Management: Ensure a program is in place to monitor for pests using spot treatments and baits rather than broad pesticide applications.
4. Effectively Clean and Maintain: Pay attention to cleaning supply ingredients and properly train employees how to use and maintain high-efficiency filters for vacuums coupled with damp cloths for dusting and the cleaning of surfaces to decrease circulation of particulates.
5. Make Smart Materials Selections: With more tightly sealed buildings due to modern construction techniques, the impact of building materials and furnishings along with personal care products and items brought into the school can impact IAQ. Steps to mitigate this include attention to materials used for construction, purchased cleaning products, and setting of HVAC controls to ensure adequate air circulation mixed with fresh outdoor air.
6. Source Control and Chemical Management: Identify and eliminate individual sources of pollution, including chemicals, or reduce their emissions via awareness and/or training about proper usage, storage, and management.

Taken together, IAQ can be assessed and improved upon to benefit classroom inhabitants.

Thermal Comfort

Tied to indoor air quality is thermal comfort. The best temperature range for learning is 68 to 74 degrees Fahrenheit with the variability subject to factors such as activity, clothing, and stress (de Dear et al., 2014; Schneider, 2002). Thermal factors have been

linked to teachers' abilities to focus on teaching impactfully and also influencing their morale (Schneider, 2002). Studies have also found that teachers believe that thermal comfort, including their direct ability to control thermal comfort within their learning spaces, affects not only their teaching quality, but also the quality of student learning (Heschong, 2002; Lackney, 1999; Lowe, 1990; Texas Association of School Boards, 2024).

Window design has been linked to thermal comfort, visual comfort, and lighting and therefore it should be considered when assessing classrooms for these dimensions. According to Montiel et. al. (2020), common window issues exist with oversized windows. They are often not functional for ventilation and are difficult to manage for room darkening. Additionally, hinged windows can reduce usable classroom or windowsill space and may face similar issues with ventilation and light control due to their design. The most preferred window is a standard-sized slider with fixed shutters or blinds to aid in room darkening.

Taken together, thermal comfort is often tied to other design features of the building along with IAQ and all should be considered together for ideal comfort and functionality.

Safety

School buildings should be safe, warm, and inviting places for students, staff, visitors, and community members to engage in academic, social, and extracurricular activities. There are a variety of ways that school design has been shown to improve safety of building occupants. This includes the hardening of exterior access points to interior, building design features, cleaning, and staffing protocols.

Secure entries and surveillance via camera and various detection systems have become the expectation in today's K-12 educational environment. However, each district determines, within state and local statutes, the exact safety standards for buildings, safety protocols, and the extent to which school buildings should be hardened and surveilled. For instance, as outlined by the U.S. Department of Homeland Security (2012), some schools have all exterior doors locked at all times during the school day with a doorbell that can show office staff who are outside the building. In others, exterior front doors are unlocked and allow entry into a secure vestibule before visitor screening is completed. Exterior safety features can include proper lighting 24 hours a day to illuminate walkways, play fields, and also deter vandalism or theft. In some school settings entire school grounds are fenced to ensure there are no visitors to the grounds during the school day. Inside of schools there are often multiple layers of security beyond exterior doors being locked.

Examples can include individual hallway and classroom locking and entry sequence protocols which is referred to as compartmentalization such that when emergency systems are activated, hallway doors close, therefore isolating parts of the building. This can be for lock downs, administrative holds, and fire or other safety purposes such as gas leaks.

While these hardening and surveillance techniques impact safety from a physical standpoint, there are relational and design opportunities to impact it as well. As a part of Safe Havens International, Dorn (2020) states, “one of the powerful components of Crime Prevention Through Environmental Design (CPTED) involves the creation of what is known as positive territoriality. Positive territoriality is used to create a greater sense of ownership and connectivity between legitimate users of a place and the physical place“ (para, 2).

According to the Centers for Disease Control and Prevention (2017), under the right conditions, people actively perceive a space as "their own" and feel responsible for its upkeep. This organization goes on to express this typically occurs through the use of physical attributes to delineate space and to express a sense of ownership and pride. The objective is to communicate to others that an area is claimed and cared for and therefore unacceptable behavior will not be tolerated. Put another way, if the high school commons evokes a sense of pride via recognition of individual achievements and school accolades, and it is a comfortable place where students spend time and feel at home, then they will take more ownership in its upkeep. This ownership translates to the concept of ‘pride of ownership’. The theory behind ‘our space’ is, *if* we want to have ‘our space’ remain a place we want to spend time, *then* we have to make sure to clean it up and treat the fixtures, furnishings, and building materials with respect so that they do not fall into disrepair or become damaged.

In a recent safety audit commissioned by WSD (Safe Havens International Inc., 2024[1]), positive territoriality is further explained as the visual and sensory enhancements that facilitate or improve the connection between students, parents, and the school employees to the physical place. Numerous research studies have shown that the use of positive territoriality can reduce the risk of crime and the fear of crime in many settings including schools (Vagi et. al., 2018). These enhancements, referred to as positive body language of a building and the grounds, include student artwork, murals, award displays, positive slogans, words and phrases, inviting color schemes, and flooring patterns designed to enhance the feel of a school and affirm the cultural values. Furthermore, the aforementioned safety audit notes that not only does body

[1]Unlike other audits commissioned by WSD, the safety audit is intentionally not linked to this report. This is due to the sensitive information included in the report related to the safety and security of a public school system and it may be exempted from public records.

positivity have a significant and positive impact on students and staff safety, but it also produces an overall greater perception of safety.

Examples of spaces that need higher levels of physical security can include corridors and stairwells. The addition of happy colors to reflect school spirit, mascots, and logos affixed to wall spaces, and combinations of colors can contribute to positive territoriality and also double as a way to aid in navigation and traffic flow via color-coded wayfinding schemes (Kollie, 2004; Cannon Design, et al., 2010).

With this research in mind, the following features that contribute to safety should be considered:

- Ample, well-lit parking for school day purposes including student (if high school), staff, and visitor parking on-site or immediately adjacent to the school with the required minimum ADA spaces.
- The main building entry is clearly marked and accessible from adjacent parking areas with signage indicating how visitors should enter the building. There is a secure entry sequence that allows reception staff to verify the identity of, and purpose for, visitors wishing to access the building. Visibility exists of the front door and vestibule area. Students arriving late to school and all visitors must check in. Visitors receive a badge indicating their name and destination.
- The reception area is accessible and staffed from when the building opens in the morning until student dismissal. It is a professional environment designed for the function of welcoming students, staff, and community members to the school.
- Secure storage exists for all confidential records and school materials needed intermittently for use. All storage areas are locked with only designated personnel having access.
- Site lines are open between classrooms and corridors, classrooms and adjacent collaboration spaces, and within the larger common spaces on the building and grounds. This can be achieved by paying careful attention to building design as well as through the use of materials such as glass.

In addition to these measures for the overall building and grounds, districts should also ensure that classrooms can be designed to the school safety protocol the district employs. For instance, there are similar, but slightly different protocols schools may choose when there is an intruder or person identified who may intend to cause harm within the building. Some of these protocols have teachers and students barricade themselves within a classroom, which could mean ensuring internal door locking mechanisms, shades to block visibility into the classroom, and heavy mobile carts or other furniture pieces which can be used to fortify entries from the inside. Other

protocols train students and staff to leave the classroom and building in such instances. Therefore, ensuring that classrooms and learning corridors which may be away from the general building safety features are designed and outfitted with furnishings and window coverings that meet the district's safety plans are essential.

Overall Aesthetics and Building Quality

Said succinctly, building aesthetics and quality matter. Students educated in newer buildings have demonstrated higher reading, listening, language, and mathematics scores than students in older buildings (Bowers & Burkett, 1989). Ballantine et al. (2021) assert that students in school buildings that are considered to be of "excellent" quality score five to 17 percentage points higher on academic achievement tests compared to students of similar profiles in school buildings considered to be of "poor" quality. However, when occupants rate the building's apparent quality, they tend toward visual signs of building quality and design rather than structural elements of quality. Such features could include measures such as the absence of graffiti or the maintenance of exterior paint (Cash, 1993; Earthman, 1994).

One reason for this is hypothesized to be that there are higher attendance rates in higher-quality schools (Durán-Narucki, 2008). Another hypothesis is that supportive and functional physical environments foster collegiality among students and staff as well as feelings of safety (Uline & Tschannen-Moran, 2008). Yet another is that "an aesthetically beautiful design school is a positive environment for teaching and learning" (Chan, 2022, p. 66). Uline and Tschannen-Moran (2008) further posit that when learning is taking place in inadequate facilities there tends not to be as clear a focus on academics, and the learning environment is less likely to be perceived as orderly and serious.

The nature and quality of the built learning environment also has been shown to impact teacher attitudes, behaviors, and performance (Buckley et al., 2004; Dawson & Parker, 1998; Lowe, 1990; Schneider, 2003). Uline and Tschannen-Moran (2008) state that teachers are less likely to show enthusiasm for their jobs or go the extra mile to support student learning when they teach in buildings they perceive to be of poor quality. Corcoran et al. (1988) concur with their findings that when teachers perceive to be working in a building of lesser quality there are higher rates of absenteeism and reduced efforts. When trying to combat this, principals in schools where the climate and culture do not support a serious focus on academics a greater likelihood exists that they will be perceived as demanding or authoritarian leaders in their pursuit of change (Uline & Tschannen-Moran, 2008).

Further under the umbrella of aesthetics is visual stimulation. Barrett et al. (2019) identify two key facets of visual stimulation - visual complexity and color. Visual

complexity is defined as the, “visual variety in the room layout, ceiling, and display in balance with the use of displays to create interest but with a degree of order” (p. 28). They further describe color as, “light walls generally, but with a feature wall or areas highlighted with brighter color, to produce an optimal level of stimulation. Bright color on furniture and in displays as accents to the overall environment” (p.28). When visual stimulation does not accomplish the aforementioned definitions there are greater distractions for students and typically greater instances of off-task behaviors (Fisher et al., 2014).

Linked to aesthetics, visual stimulation, and acoustics, is attention. While sustained attention develops throughout childhood, recent research shows rapid growth between ages 5-6 and again between 11-12 years old (Betts et. al., 2006). By 7 years old a child has developed goal-directed selective attention skills (Rueda et al., 2004). As Wisniewski (2024) explains, selective attention is essential in all school-related tasks from initiating assignments to deliberate responses versus an impulsive reply. In school, creating environments that foster students’ ability to control the target of their attention (select) and reject all other stimuli is critical. Thus, care must be paid to tuning the environment of a classroom to allow for student attention during class.

Another feature of overall building design is the creation of what are referred to as ‘restoration areas.’ These spaces have also been referred to as calming spaces or rejuvenation spaces. These areas, as outlined by Kaplan & Kaplan (1989), co-developers of attention restoration theory, offset mental fatigue. These areas provide users with a sense of being far away from their current environment with elements that are attention catching, yet calming.

An additional way to transport building occupants is to use biophilic design. According to Lanier (2024), biophilic design aims to create healthier, more productive spaces by creating a strong connection to the environment through the use of natural and nature-inspired elements. With research showing that biophilic design can reduce stress, enhance creativity and clarity of thought, improve well-being, and expedite healing, it is important to include these elements in school design (Browning, et al., 2014). Biophilic elements can be achieved via paint accents, artwork, carpet tile with natural and varied textures, colors, and shapes within each. Studies have shown that incorporating more natural light, outdoor views, greenery, and organic materials can improve the well-being and productivity of building users (Hartley, 2024).

Nair (2014) puts forth Four Design Principles for schools which includes:

- Be welcoming (safe, nurturing, encouraging of good citizenship);
- Be versatile (agile and personalized);

- Support varying and specific learning activities (multiple learning settings); and
- Send positive messages (about identity and behavior).

While each of these principles relates to creating modern, flexible learning spaces for myriad activities that reinforce a positive and safe culture, one principle directly applies to overall building aesthetics and design that impact perceptions of building quality - *Be welcoming*. Nair (2014) continues to explain that entering a school begins upon arrival onto school property– parking, the bike rack area, student drop off/pick up areas, the bus zone, landscaping, and the width and oath of walkways all create an impression for students, staff, visitors, and community members. Lighting along with these design elements and aesthetics also can impact the perception of safety. Once inside the building, does it look and feel welcoming? What do students see since their height is not the same as adults until late middle school or even into high school? Are personal comfort factors such as clearly marked, accessible, and clean restrooms? Are there water bottle fillers and meal options to accommodate varied dietary needs? Is there access to snacks throughout the day during non-academic periods (Nair et al., 2020)?

Buildings that are welcoming also send positive messages about identity and behavior. Visual cues such as lighting, graffiti or the absence thereof, maintained spaces vs. those in disrepair, all send messages that impact a sense of welcome, belonging, and perception of quality.

Barrett et al. (2013) created a model based on six built environment design parameters including color, choice, connection, complexity, flexibility and light. The model was used to predict the impact of the six design parameters on students' learning progression. Comparing the "worst" and "best" classrooms in the sample, these factors alone were found to have an impact that equates to the typical progress of a student over one year.

Taken together, these studies illustrate the powerful impact overall aesthetics and building quality have on student achievement, staff feelings of job satisfaction, and the general feeling visitors and community members may experience when in the school.

Impact of School Facilities on Student Outcomes

A body of research exists connecting the quality of school facilities to student achievement outcomes. McGuffey (1982) first explored the nexus between a school's physical environment and student achievement. Findings from this study demonstrated that there was a strong relationship between student achievement and building quality. Glen Earthman is considered to be the most widely cited

author on the connection between school conditions and student achievement (Barrett et al., 2019). His research as well as those of others provide compelling evidence suggesting that "the architecture of buildings and the layout of classrooms influence students' learning, behavior, and identities" (Ballantine, et al, 2021, p. 354).

Furthermore, Earthman's literature on the topic defines "poor quality" facilities as "those that lack appropriate HVAC systems, have poor lighting, are old, are noisy, lack functional furniture, or have some variation or combination of these qualities" (Earthman, 2004, p. 8). The research that he has conducted has found that students educated in poor buildings scored between 5 to 10 percentile points lower than students in functional facilities after controlling for socioeconomic status (as cited in, Barrett et al., 2019). The literature also posits that the overall age of buildings is detrimental to student achievement. Maxwell (1999) found a correlation between newer facilities and student performance levels and a significant relationship between upgraded facilities and higher math scores. Chan (1996) underscores that older buildings may become obsolete with limited capacity to accommodate innovations in curriculum development, instructional strategies and content development. Additional studies have identified that the quality of the school facility reduces daily attendance rates and increases student dropout rates (Branham, 2004). Widiastuti et al. (2020) studied 772 students in elementary schools, junior high schools, and senior high schools to see what factors most influence the learning comfort of students in the classroom. The results showed that the highest influence comes from air circulation, quietness, cleanliness, and adequately supportive facilities over more human centered factors such as peer attendance. Schools without major maintenance backlogs have a higher average daily attendance (ADA) of 4 to 5 students per 1,000 on average, according to the Environmental Protection Agency and test scores improve, too, as building conditions improve, with studies showing test scores can go up by three to 17 percent (Texas Association of School Boards, 2024). Other studies have found that students in non-modernized buildings scored lower on basic skills assessments than those students in modernized or new buildings (McGuffey & Brown, 1978; Plumley, 1978). When schools have been renovated, improvements in achievement have followed (Maxwell, 1999). In short, student learning is a product of the physical environment of their school (Uline & Tschannen-Moran, 2008).

Relationship Between Building Features and Student Achievement

For students, there is a distinction in the literature that is worth exploring for the sake of this literature review. The design of the learning environment and its interplay with student achievement are related. Nair (2014) uses the analogy of

“hardware” and “software”, where hardware is the school building within which the software of education runs. He asks, “do we design new software - the future of education - around the limitations posed by our existing hardware – school buildings? Or, do we design [sic] education and figure out how buildings can be designed or renovated to accommodate this model?” (p.2). Asked another way, **are outdated school facilities perpetuating educational outcomes that fit a different era and economy rather than supporting present day and future-focused educational programming needs?**

Much research in the past 15 years has focused on the impact of student engagement in classroom learning. Hattie’s (2008) findings, as reported in “Visible Learning”, show that boredom has a negative effect size of -0.47 on student learning. Thus, as Cupolo (2024) explains, students need environments that foster deep, engaging learning experiences in which they can interact and discuss their learning with each other. Engagement looks different across different programs and courses, but generally becomes visible to observers (and can be ascertained by carefully crafted survey questions) when students show attention, curiosity, interest, and passion about what they are learning. This extends to the level of motivation and effort to complete learning tasks, leading to accomplishment of learning goals. Interaction with concepts being taught and practicing their application varies across disciplines, but it often yields higher engagement when discussions, projects and hands-on learning can occur. Per McDonough’s *Engaged Learning Model*, the teacher’s role progresses from being the sage on the stage to the guide on the side in this model of learning (Cannon Design et al., 2010). Thus, the question to ask is, if students need to be, in part, actively grappling with new knowledge and interacting with others to make meaning, do all classrooms allow varied set up and furnishings to accomplish this?

The Interplay of Student Engagement, Classroom Size, and Classroom Furnishings

In one study, the more adjustable the furniture was (height-adjustable chairs and desks, inclinable tabletops, and rolling/swivel chairs with rocking mechanisms), the more frequently students varied their postural behaviors. Through “attention endurance” tests (tests designed to record the students’ attentiveness and ability to concentrate), the results further showed that giving students increased ability to move while seated–rocking, swiveling, and rolling–triggered far-above-average levels of concentration during test taking (Cannon Design et al., 2010).

Higgins et al. (2005) explain that, “much of what is known about student comfort, particularly in terms of furniture, has yet to be translated into actual school environments” (p. 7). The movement to student-centered learning requires

classrooms to have some degree of flexibility and provide 'ownership' of space and equipment by both teachers and students. Some physical elements in the classroom improve comfort, well-being and probably attitude - and so, perhaps, also improve achievement.

In comparison to explicit learning spaces over which teachers have some level of control based on instructional approach, the literature highlights that overall building mechanicals and features are often more centrally managed by the district. There are two ways in which these features and maintenance thereof impact student learning and achievement: if they are unmaintained and therefore in a state of disrepair and/or they were designed for a different period of time when different instructional techniques were employed by teachers.

Building mechanicals and features such as accessibility, acoustics, indoor air quality, lighting, power availability, safety, and thermal comfort have all been shown to impact students and learning outcomes. The post-war era of education in the United States, when most schools were constructed to accommodate the increasing population, were designed and constructed for students that were non-disabled. Furthermore, the most widely employed instructional approach of the time mostly involved teachers lecturing and leading classes of quiet students receiving the information and completing individual practice at their desks. With the proliferation of research examining the impact of various instructional methodologies and burgeoning technologies that allow for new ways of individualizing the learning experience of each student, most schools have moved from a more teacher-centered to a student-centered learning environment (Nair, 2014). In a teacher-centered classroom the teacher is actively providing direction with the student as a proverbial vessel waiting to be filled with the information that the educator possesses. Freire (2000) refers to this as the "banking" concept of education; meaning that students serve as the passive depositories of information and teachers serve as the depositors of the knowledge that they possess. In other words, students are receiving information, but not necessarily engaging with said information which is a distinct difference from what is considered a student-centered classroom or way to maximize learning. As Brooker (2011) notes the more student-centered approach includes 'active learning'. The author defines 'active learning' as the antithesis to passive learning, wherein students construct their own knowledge by engaging in educational tasks themselves.

As mentioned, there is interplay between unmaintained building systems and schools designed for a different era in education. Using the example of the transition to more student-centered learning, classrooms of yesteryear were built considerably smaller than modern standards would suggest appropriate. Additionally, due to this size constraint, this often only accommodates traditional student desks organized in

rows facing the front of the room where the teacher addresses the class in a teacher-center capacity mainly through lecture. By contrast, in a student-centered classroom the student is an active participant in learning with the teacher as a facilitator or "guide on the side". In this model, learning is structured so that students use the information to construct meaning, thus using higher order thinking skills to take basic knowledge and apply, analyze, evaluate, and synthesize it. Students' engagement in this type of thinking is what is linked to higher levels of achievement.

This same student-centered model of instruction also leverages the benefits of cooperative learning, which is when two or more students work together towards a common goal (Nair et al., 2020). Cooperative learning is widely accepted and, when properly structured, it not only increases students' ability to make meaning of information and apply it in new ways, but also allows for the development of interpersonal skills, teamwork, and true collaboration. These skills are also highly necessary life skills. A particularly useful classroom furnishing that supports teamwork and true collaboration is that of the vertical white board. When students "white board" their thinking they are engaging in a true constructivist learning opportunity by wrestling to make meaning (Bush & Kelly, 2004). Therefore, students' access to white boards in classrooms is important to nurture these learning opportunities.

Furthermore, teachers who implement student-centered instructional models arrange furniture (if possible within the size of the classroom) so that students can engage in myriad activities such as small group work, individual reading and writing, presentations with classmates, and some whole group activities. Schools designed for a bygone era with undersized classrooms, fraught with accessibility challenges when furnishings are present, pose significant impediments to student-centered instruction. Thus, outdated school buildings pose a compounding effect on what is considered current, impactful, inclusive instruction.

Achievement in Flexible Classroom Learning Environments

Flexible learning environments typically require more square footage than traditional classrooms and/or have adjacent breakout spaces where students can remain in teacher site lines. This additional space is required because flexible learning environments, by their very nature, are designed for movement during class and include multiple learning stations or centers. Often these spaces feature both individual student desks and chairs which are on wheels or castors, an array of small and medium-sized tables for small groups to form, and mobile and fixed areas for ideation and display of student work samples and exemplars.

Pedagogical agility refers to flexible, adaptable pedagogical approaches in response to students' needs, learning content, and learning context aimed at improving student engagement and learning outcomes (Ramsay et al., 2019). Instructors in flexible learning spaces have the freedom to implement a range of instructional activities in a timely fashion during class such that the deployment of various instructional activities is beneficial for students' active and continuous engagement, as compared to students in a traditional learning environment (Chiu & Cheng, 2016; Cotner et al., 2013; Kariippanon et al., 2019; Ozkan Bekiroglu et al., 2022). According to Lee et al. (2023), to create flexible configurations both people and furnishings need to be moveable, and they need room in the space to move. This combination supports both pedagogical agility and student engagement. In addition to moveable furnishings, gone are the days of a 'front of the classroom'. If a room is truly flexible, it requires ample writable surfaces for teachers and students, who when ideating and creating, are deeply engaged. Additionally, there should be accessible well-placed digital displays with wireless content sharing capabilities to create instructional flexibility and promote collaborative learning.

Kariippanon et al., (2019) researched the amount of time students collaborated, the type of engagement with the lesson, and students' interaction with peers in both traditional and flexible learning environments. Their study showed in flexible learning spaces, students spent more time collaborating and interacting positively with their peers, as well as more time presenting work back to the class. Further, students spent less time being taught explicitly and working individually, than in traditional classrooms. Overall students in flexible learning spaces spent a greater proportion of class time actively engaged with the lesson. This was demonstrated through verbal and physical behaviors appropriate to the task set by the teacher, such as raising hands and writing or discussing the activity. Students were less likely to be verbally off-task and spent less time engaging with technology relative to students in traditional classrooms. Thus, flexible learning environments appear to not just bolster student engagement in the learning process but also positively impact social, emotional, and executive functioning; again necessary lifelong skills.

Attraction, Retention, and Development of Staff

While an 8% total teacher workforce attrition rate has held fairly constant for the past three decades in the United States (Merod, 2023), nearly 50% of new teachers leave the profession within the first 5 years (U.S. Department of Education, n. d.). In their work to estimate the per-teacher cost of turnover, Tan and Kemper Patrick (2024) have arrived at three estimates based on district size from small to large. They estimate the per-teacher turnover cost ranges between $11,860-$24,930. This includes costs such as recruiting, hiring, and training new teachers. This further includes the cost of the involvement of interview team members. The impact of the

school building, from maintenance features to classrooms and professional work areas, is therefore worth considering given the financial costs and researched impact of teacher turnover on student achievement (Tan & Kemper Patrick, 2024).

Sparks (2025) highlights a recent study that asked teachers whether schools are safe and orderly as a component of working conditions. Responses were less favorable than before the pandemic, which show that teacher working conditions have continued to decline since 2021. This coupled with dissatisfaction in compensation, leadership, parent involvement, and colleague collaboration puts further stress on classroom teachers. These factors drive burnout (Davis, 2021). Further coupling the aforementioned factors with the isolating nature of a teacher's job and novel problems that need to be solved as the day unfolds, leads one to ask how school buildings could be designed to promote wellness and a sense of belonging while fostering connections and collaborative opportunities with other staff to prevent burnout.

According to the World Health Organization (2019), "Burn-out is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions:

- feelings of energy depletion or exhaustion;
- increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and
- reduced professional efficacy" (para. 4).

Davis (2021) states that burnout is caused by an imbalance between job demands and job resources, with the top four resources to create well-being and healthy workplaces listed as autonomy and job control, development opportunities, role clarity, and participation in decision-making. Given the rigor of any given school day, which includes dozens of variables in the form of individual students and their needs, the schedule demands of the school calendar, and the myriad ways teachers support students beyond academics, attention should be paid to school design that supports the professional work at hand. Features of the classroom should include ample areas to prepare for class, ample space from which to engage with students during class, and ample space to have additional materials and resources ready for the next class of students arriving with minimal transition time.

In addition to individual work and preparation space, Nair et al. (2020) identified professional work spaces in schools as also needing conference tables and whiteboards for varied groups of teachers to collaborate, adequate storage for shared materials, and a private area for phone calls or private conferencing along with access to food. The authors go on to suggest that professional work areas such as

this are best housed as dedicated interdisciplinary office space within the learning community area (Nair et al., 2020).

Moreover, schools should support staff physical wellness through the provision of ergonomically correct furnishings. These furnishings support impactful teaching methods within their discipline. Considerations for specialized flooring, functional technology, and adequate task lighting must also be explored.

Assessing School Buildings

According to Castaldi (1994), the profession of educational facility planning in the United States developed slowly prior to World War II. One of the pioneers in the field was Nicholaus Engelhardt, Sr., a professor at Teachers College, Columbia University in the 1920s. Englehardt developed an educational survey process used as the foundation for the educational space adequacy (ESA) assessments used today along with determining methods for short and long-term enrollment projections for schools.

Contemporaneously, in 1921 Samuel Challman of Minnesota, Charles McDermott of New Jersey, and Frank H. Wood of New York met to create an organization that would, “promote the establishment of reasonable standards for school buildings and equipment with due regard for economy of expenditure, dignity of design, utility of space, healthful conditions, and safety of human life” (Castaldi, 1994, p. 18). One year later the National Council on Schoolhouse Construction was founded and served as a resource for school planning and building. The Council further developed minimum standards for said purpose, including the publication of guides.

Following World War II, in 1946, the organization moved away from emphasizing minimums and instead promoted basic principles of sound educational facility planning.

Today, educational planners conduct two types of surveys (or some refer to them as assessments) to ascertain the condition of a school building. As previously mentioned these are the facility condition assessment (FCA) and the educational space adequacy (ESA) assessment. For greater context:

- a facility condition assessment (FCA) focuses on building systems, envelope, and materials; and
- an educational space adequacy (ESA) assessment takes into account building and classroom square footage and room count, current and projected enrollment, and generally the programs and services the school offers.

In addition, spaces needed for non-instructional activities such as administrative, student services and health services functions, co-curricular activities, and athletic programs are discussed. Finally, any board policies impacting building utilization, including but not limited to, class size policies, course requirements, community usage of the building, transportation policies, and teacher and staff workload should be provided so the full picture of opportunities and constraints can be understood.

The main purpose of the two aforementioned assessments is to create a comprehensive analysis of the school building and grounds (and perhaps those of each school in the district) as the basis from which to develop a long-range facilities plan. In short, the assessments are meant to systematically gather information about the existing state of repair of the school facilities, juxtapose school capacity with current and projected enrollment, and report on the adequacy of the spaces within the building to meet enrollment needs, program and service offerings, and other desired usage of the school. All together, this information can be used to identify any inequalities of educational opportunity within a school district's existing buildings and outline what is needed to meet current and future needs as expressed to create a long-range facilities plan (Castaldi, 1994).

To assess educational adequacy, architects must inventory the spaces within a school building in order to use the aforementioned enrollment information to establish whether the building is adequate for the current programming and student enrollment. The Guide for Planning School Construction Projects in Minnesota (2018) from the state's Department of Education is widely viewed as the current industry standard by school architects throughout the United States. Said differently, the guidelines within this document from Minnesota's Department of Education are the de facto guidelines used throughout the country to steer the planning process of school construction projects, thus the benchmark for the assessment of educational adequacy. Within the ESA assessment, there are three widely accepted methods that are used to calculate functional school capacities (Wauwatosa School District Long- Range Facilities Plan, May 2024, pp. 55-65).

Method 1: Capacity by Desired Class Size

In this model maximum capacity is defined as the point where every teaching station in a building is utilized at maximum occupancy each period of each day. This leaves no scheduling flexibility without exceeding class size limits. **This model calculates target capacity as the point where the building functions optimally as an educational facility.** This is determined by applying an efficiency factor to the maximum capacity number previously established. Efficiency factors vary by school level in line with Nair's (2014) caution that it is important to look differently at

different developmental school levels such as elementary school, middle school, and high school. Thus, the varying calculations used are:

- 90% for elementary grades (grades 4K-5) since students spend the majority of their day in the same classroom;
- 85% for middle school (grades 6-8) as they begin to circulate to other classrooms more for electives in these grades; and
- 80% for high school (grades 9-12) since these students typically rotate classrooms each period of the day and thus a different level of flexibility in room availability is needed to make the master schedule workable.

Method 2: Capacity by Learning Environment Area.

This calculation determines the square foot area available in each classroom and divides it by a nationally recognized benchmark allowance per student to gain a better understanding of how a school's current size and configuration may support a given number of students (Minnesota Department of Education, 2018). These benchmarks include:

- Early Learning (EC/4K/5K): 45-60 square feet per student
- Elementary (Grades 1-5): 30-40 square feet per student
- Middle and High School Core Classrooms (Grades 6-12): 25-35 square feet per student

It should be noted that the above square foot per student recommendations are only for core classrooms. Specialty classrooms and offices often require more space than these allowances to accommodate things like instruments, art materials, technology, or large athletic equipment. The Guide for Planning School Construction Projects in Minnesota (2018) provides a reference for each type of specialized space by school level. Therefore, if a school offers a particular program or service, a space need benchmark can be added onto the basic core classroom benchmark to calculate the square foot per student benchmark in that program or service area (Minnesota Department of Education, 2018).

Method 3: Capacity by Gross Building Area.

This **calculation involves the total size of the building** including instructional space, support space, mechanical space, circulation and walls. This uses the recommended total building area per student. However, this does not take into account different usage and whether there is ample space based on how the building areas need to be used. The recommended square footage per student for this model of calculation includes:

- Elementary School (Grades 4K-5): 125-155 square foot per student

- Middle School (Grades 6-8): 170-200 square foot per student
- High School (9-12): 200-320 square foot per student

In addition to building capacity, the following site sizes are industry-accepted standards (Castaldi, 1994). Student numbers provided in this formula are the school's design capacity, or the number of students in seats in classrooms, not building code capacity as determined by the Fire Marshall. That number would be much higher and not in line with Board Policy and likely ideal pedagogy.

- Elementary School = 10 acres + 1 additional acre for every 100 students
- Middle School = 20 acres + 1 additional acre for every 100 students
- High School = 30 acres + 1 additional acre for every 100 students

To create a full picture of a school district's needs and opportunities, three additional studies that go beyond traditional ESA assessments are recommended, but are an additional cost to districts. Castaldi (1994) notes that this includes:

- A demographic survey to understand changes in student population over time and growth potential of the school district rather than just district provided current enrollment numbers.
- Finance and operations review and modeling including, but not limited to the cost of known capital maintenance needs for existing buildings, how transportation costs could be impacted by attendance boundary rezoning, flux with enrollment shifts, current energy efficiency along with any desired improvements and available rebates, general site safety and traffic flow, and existing debt and bonding capacity as a means to address maintenance needs and/or improve buildings/add new one(s) to the portfolio.
- The aforementioned educational program study to complete an in-depth examination of the programs and services offered by the district, and the needs thereof to facilitate high quality delivery of such. This includes the course content, sequence, instructional methodology and techniques, and materials needed to deliver the course based on best practices. Per Nair (2014), the ideal process for this would include an orientation with the principal and school leadership team followed by a site walk with custodian and members of the school leadership team. With these foundational steps in place, visioning with the school leadership team would take place to determine the long-range vision for the facilities as well as a follow up community workshop to do the same. This work would include a final step in a school culture study to ascertain what will support the culture that is desired beyond brick and mortar, including the feel and experience. Knowing the preferred culture can assist in grounding the commencement of design and prioritization of features of a building and grounds.

When considering the technical aspects of the determination of ESA and the varying factors that are not easily plugged into an equation, Rogic (2014) reminds us that, “ultimately the ideal learning space will be different for every school depending on the school’s pedagogical vision and its context” (p. 65). The Wauwatosa School District completed a facilities assessment and an ESA evaluation in 2016 and 2024 using the aforementioned methodologies. Further consideration was given as to whether these assessments provided enough specific information for a community Task Force, District leadership, and the School Board to identify a long-range facilities plan for the District. In particular, it was questioned whether or not the assessment of specific building and classroom features inventoried aligned to programmatic best practices and WSD’s standards for curriculum, instruction, and assessment.

After much discussion and a review of relevant literature, it was clear that while the assessments recently completed for the District accurately provided a catalogue of upcoming necessary maintenance, school enrollment, school capacity, and space adequacy information in general, there was not a mechanism in place to fully account for the uniquenesses of the school district’s buildings. Notably missing was the lack of assessment of how the buildings support the District’s Strategic Plan, the recently created Philosophy of Instruction, or the in-process, in-depth programmatic audits for each department and service within the District. With these nuanced and evolving standards in place, this comprehensive analysis of WSD’s learning spaces was conceived and designed so that it emulates the “Conrad technique” which directly relates secondary school capacity to the educational program. In other words Conrad’s technique is based on the principle that, “the building should fit rather than determine the program” (Castaldi, 1994, p. 96).

And thus, this is how the *Analysis of Learning Spaces* for Wauwatosa came to be. It leverages best practice research in curriculum, instruction, and assessment, with the District’s most recent curricular audits, and the District’s Strategic Plan. This is further coupled with industry standards and known features of high quality secondary school buildings to deeply analyze whether or not the spaces within the District’s four secondary schools properly support expected instructional and programmatic needs.

Wauwatosa School District Analysis of Learning Spaces Criteria Development: Aligning Design with Pedagogical Expectations

In conceiving the *Analysis of Learning Spaces* research project, it was understood that the analysis would be rooted in not only the previously addressed literature, but would go beyond the extant literature to create a newly formed model that would incorporate the District’s Strategic Plan, Philosophy of Instruction, and next steps

identified via curriculum and programmatic audits. By evaluating each of these additional inputs and identifying the Wauwatosa-specific areas for continuous improvement, a customized and extremely detailed and meaningful *Analysis of Learning Spaces*, down to individual classroom space in each building, could be completed.

District Instructional Philosophy and Derivative Methods. The Wauwatosa School District has engaged in a comprehensive study of the most impactful, evidence-based approaches to curriculum delivery as well as instructional and assessment methodology. Through this study, and the use of external audits by experts in specific fields, the District has created multiple documents and handbooks that outline for staff, and the community, WSD's core values, expected instructional approaches, and options to best support each student's learning journey. It is important to examine these fully in the context of the *Analysis of Learning Spaces* because staff must have a built environment, coupled with fixtures, furnishings and equipment, that allow for these approaches to occur with fidelity. Specific expectations, approaches, and what they entail from a teaching and learning space, are brought forward in this section.

The District's Philosophy of Instruction (Appendix B) states in part that, "the ultimate goal of instruction is to create inclusive classroom communities where all students experience a joy for learning and develop productive learning dispositions. It is through access to strong universal instruction aligned to standards and teachers' intentional planning that instructional equity is attained". In follow up to this determination of philosophy and connected to the District's Strategic Objectives, an Instructional Handbook for all staff was released in August of 2023 (Appendix C). Herein lie many of the foundational components of the specific rubrics developed to analyze district learning spaces.

Furthermore, the District has articulated Equity Core Beliefs (Appendix D). Core Believe #3 states that, "the District shall ensure that educational programming is accessible, representative of the student population and equitable to all students". Program accessibility means that each student has entry points into the learning of educational programming. For example, this looks like students and teachers having access to any requisite technology or materials for the programming as well as students and teachers having access to one another to engage in the learning process. Therefore, specific care to include elements such as technology access, material access, storage, circulation access, and collaboration spaces was made on the rubrics as they were developed.

The Vision of a Graduate (Appendix E) contains five key components which include:

- Strong Academic Foundation;

- Critical Thinking + Problem Solving;
- Identity + Agency;
- Collaboration + Independence; and
- Social-Emotional Awareness + Regulation.

While each of these constructs is well defined in district documentation, it is noteworthy that collaboration is explicitly defined as, “I am able to work in different environments to complete or move a task forward. I work well within a team and value other people’s strengths”. This has implications for analyzing learning spaces to ensure that there is space within classrooms, space in classroom adjacencies for group collaboration, flexible furnishings, and that staff are using instructional strategies which allow for collaboration.

Additionally, the District has identified Learning Look Fors. This includes having visible, posted Learning Targets throughout the entirety of the lesson (WSD Instructional Handbook. p. 46 - Appendix C). In order to achieve this, ample wall and/or display space must be available in the classroom and/or access to multiple digital displays for this purpose.

The District’s Instructional Framework (WSD Instructional Handbook. - Appendix C) explicitly calls out high leverage strategies and expectations that, “teachers act as facilitators of learning by creating opportunities for students to collaborate, supported by strategies to make thinking visible and by connecting to and building prior knowledge” (p.6). In order for students to collaborate freely and to make thinking visible, ample wall and/or display space must be available within classrooms or adjacent learning spaces that can be easily supervised. Additionally, space and flexible furnishings must allow movement in and out of small and large groups to occur seamlessly. Further, the District within its Non-Negotiables for Teaching and Learning (WSD Instructional Handbook. p. 7 - Appendix C) lays forth, among other expectations that there are, “student-centered learning experiences, which are designed for total participation, and which require complex thinking, promote dissonance, and utilize:

- multiple modalities and pathways
- peer collaboration
- purposeful movement
- interaction with text
- student choice and voice [Instruction; Educator Effectiveness Standard 3]”.

This again underscores the District’s requirement of staff to plan for and execute lessons that are *student-centered* and include collaboration and movement, both of which require space and a safe place to do so.

In order for teachers and school staff to be most effective in supporting student-centered learning and growth via the learning cycle, the Wauwatosa School District expects staff to work within collaborative structures (WSD Instructional Handbook, p. 15). Adult collaboration, like student collaboration, requires a place to meet as a group, have discussion, display data or other forms of work in progress, and to do so in a private space away from students. Therefore communal gathering spaces for large and small groups of educators, such as conference rooms, is a consideration when analyzing the building as a whole.

Additionally, the Wauwatosa School District is committed to Culturally Responsive Learning Environments and trauma sensitive teaching practices (WSD Instructional Handbook. p. 17 - Appendix C). Among the research-based ways to realize this commitment for students is via room arrangement. Specifically, the District outlines for staff that rooms should be arranged so that:

- Students can see all instructional materials;
- Teacher can see all students;
- Accessibility to a calming corner;
- Room arrangement can easily be changed to allow for collaboration;
- A variety of learning stations are present; and
- The room can easily be rearranged to accommodate various formats of instruction.

Again, to accomplish this, individual classrooms and learning spaces around the building must have ample wall space, digital display capabilities as well as square footage with right-sized and flexible furniture to accommodate these expectations.

Furthermore, active instruction, specifically called out as a classroom management strategy is expected (WSD Instructional Handbook. p. 34 - Appendix C). Active instruction occurs when the teacher interacts frequently with students. The District further posits that, “when actively supervising, the teacher reaches all students by moving about the room when conducting lessons and during independent work times. Teacher proximity reduces misbehavior and increases student engagement”. For staff to be able to freely and spontaneously move about the classroom, ample classroom space must exist so that student materials have a space to be off of the floor so as not to create a trip hazard for staff.

Activating Background Information & Brainstorming. There are three different methods the District promotes in performing these important instructional techniques. Doing so directly illustrates features of current classrooms that are needed to support evidence-based instruction for students. For example, to activate prior knowledge prior to introducing students to new material is the engagement strategy of the "Image Walk." As described on pages 48-49 of the WSD Instructional Handbook, "images should be chosen that highlight key terms or concepts that students will be reading about. For solid connections to be made, these images should be visible to students as they interact with a text. Therefore, educators should place these images in various areas throughout the classroom and number each one accordingly to be referenced later on in the lesson". For this strategy to be impactful, accessible wall space, both in the form of space to hang images and space for students to navigate from their "desk" to the image, is necessary.

A second method is Carousel Brainstorming (WSD Instructional Handbook. p. 58 - Appendix C). This strategy has students, in small groups, move throughout the classroom brainstorming on large sheets of paper or vertical whiteboards. In round-robin fashion, each small group moves about the room and adds to the paper at each location with each specific topic. At the conclusion, students participate in a Gallery Walk and read what is on each paper. In order for this strategy to be impactful, accessible wall space, to either hang large poster paper or utilize a vertical whiteboard, is necessary. Additionally, students, in small groups, must have ample space to move together around the classroom free of hazards (e.g. other students and students' belongings such as backpacks, power cords, and extension cords). The teacher too needs to be able to move freely throughout the classroom to monitor student thinking.

A third recommended approach is Four Corners (WSD Instructional Handbook. pp. 59-60 - Appendix C). This method has students decide if they "Strongly Agree," "Agree," "Disagree," or "Strongly Disagree." on a topic posed by the teacher, then to move to a part of the room designated as such for small group discussion. The teacher then facilitates a class discussion so that the class can hear from all four corners, and students can move about the room if they change their mind. In order for this strategy to be impactful, students must be able to move about the classroom free of hazards (e.g. other students, technology cords, backpacks) and far enough away from other groups to engage in small group discussion. The teacher also needs to be able to move freely throughout the classroom to listen in student discussions and probe deeper thinking. Additionally, the teacher and students must be able to hear one another when sharing out in the large group from different parts of the classroom.

Analyzing, Synthesizing, Organizing Ideas & Making Connections. Once background knowledge has been activated in students and there is shared knowledge to commence additional learning, the next phase of the learning process includes analyzing, synthesizing, organizing ideas and making connections. Similarly to activating knowledge, interacting with other students and the teacher beyond just with text or materials provided, leads to higher levels of understanding and the ability to ultimately apply learning to novel contexts. High leverage strategies that support this include:

- The Elevator Speech (WSD Instructional Handbook. p. 77 - Appendix C) is one such way for students to distill down their learning and share with a peer. In particular, this strategy asks students to prepare and deliver a (persuasive) short speech about their learning that lasts 30 seconds or less (the length of an elevator ride). In order for this strategy to be impactful, students must be able to move about the classroom free of hazards, including but not limited to other students and students' belongings (e.g. backpacks).
- The Gallery Walk (WSD Instructional Handbook. p. 80 - Appendix C) is another example. When using this strategy, students explore multiple texts, images, or work produced by their peers that are placed around the room. This strategy offers purposeful movement and the chance to discuss what was created, seen, and why to make connections to learning material. In order for this strategy to be impactful, access to wall space to either hang large poster paper or utilize a vertical whiteboard, is necessary. Additionally, students, in small groups, must have ample space to move together around the classroom free of hazards (e.g. other students and students' belongings such as backpacks).

These are just two of the myriad ways in which educators prompt student analysis, synthesis, organization, and meaning making. During these opportunities it is critical that students and educators are moving about the classroom space. Therefore, the same aforementioned conditions necessary for these strategies to be impactful for students also pertains to the teacher.

Academic Conversations & Sharing Ideas. An additional manner in which student learning takes root is via academic conversations and the sharing of ideas. Student talk is an essential component in a student's learning process. Vygotsky (1978) posits that learning is a result of social interactions and Freire (2000) adds that "without dialogue there is no communication, and without communication there can be no true education" (pp. 92-93). In short, student-to-student as well as student-to-teacher dialogue is paramount to learning. In order to accomplish this, students must be able to aptly move about the room to pair with partners or converge into groupings for dialogue. Furthermore, to monitor student dialogue, the teacher needs to be able to comfortably move throughout the classroom.

While each of the listed approaches requires space beyond traditional room configuration of desks and rows, those that need the most flexible seating and space in classrooms include Campfire Discussion (WSD Instructional Handbook. p. 86 - Appendix C) , Fishbowl (WSD Instructional Handbook. pp. 91-92 - Appendix C) , Concentric Circles (WSD Instructional Handbook. p. 94 - Appendix C), and the extremely powerful Socratic Seminar (WSD Instructional Handbook. pp. 96 - 97 - Appendix C) which research has shown has an effect size of 0.82 - over two years' worth of growth in one year's time (Fisher, Frey & Hattie, 2016; Hattie, 2012).

Instructional Levers for Universally Designed & Culturally Responsive Classrooms. Further within the Instructional Handbook is WSD's Instructional Levers for Universally Designed & Culturally Responsive Classrooms (WSD Instructional Handbook. p. 8 - Appendix C). This document lays clear for staff what a visitor should expect to see, in relation to the Wisconsin Teacher Standards and the District's instructional levers. In regards to the learning environment (which is Teacher Standard 5), it specifies in part that the physical arrangement of the classroom:

- Support learning goals (i.e. desks/tables grouped for student collaboration);
- Intentionally provides access; and
- Supportive classroom management systems exist.

In order for these practices to truly be leveraged and impactful, there must be ample space within the classroom to group desks/tables together while also providing pathways for students and the teacher to access one another (Evertson & Emmer, 2009).

Furthermore, the lever of access, which directly relates to Teacher Standard 2 - Instructional Planning, and Teacher Standard 3 - Instructional Delivery, clearly calls out the following. The content that is presented to students must be done using multiple modalities (written, audio, visual) which requires access to technology as well as space within the classroom, or its adjacency.

Finally, the instructional lever of engagement, which is tethered to Teacher Standards 3 (Instructional Delivery), Standard 4 (Assessment of Learning), and Standard 5 (Learning Environment). This lever requires that:

- Teacher circulates, reinforces on task behavior, and interacts with students in response to their work; and
- There is a combination of whole group, small group, and individual work time as appropriate and informed by student data.

Again, in order for these practices to truly be leveraged and impactful, there must be ample space within the classroom for the teacher to circulate and interact with students as they need to be able to access one another (Evertson & Emmer, 2009). Additionally, there must be enough space within the classroom to ensure fluidity between whole group, small group, and individual work based on the needs of the students.

Specific Programmatic Needs. While there are overarching requisite needs of any classroom space as have been outlined in the prior sections of the literature review, to fully analyze the learning spaces within the secondary schools of the Wauwatosa School District, it was critical to also include program-specific needs based on both research and curricular audits wherein they had been completed in the past five years for the district . Examining research related to program-specific spaces allowed a check in current district practice with recommended practice and in some cases, outcome-based information about the effectiveness of certain school building configurations relative to program adjacencies, or other classroom design uniquenesses that are important for the purposes of this study. In addition, for programmatic areas where the curriculum audit has yet to be completed, this allowed for a check of what was known to educators and how the programs were being run within existing spaces against external best practices and/or industry recommendations in the case of the career and technical education fields. This background information was foundational in the creation of customized content-specific rubrics where nuances of space design and features therein may be present. What follows is a description of what is needed in each learning environment to support the specific programming desired by the Wauwatosa School District.

Business Education. The design of business education classrooms for grades 6-12 is essential for creating a learning environment that fosters the development of critical business skills, collaboration, and allows for the demonstration of practical knowledge. The ideal business education room integrates architectural elements and furnishings that allow for flexibility in function. It also supports easy collaboration with seamless technology integration. The environment includes appropriate ergonomics and storage for programmatic materials. This combination creates an engaging and efficient learning environment.

Typical courses within business education include personal finance and financial literacy, accounting, business law, business management, entrepreneurship, various software and programming certifications, and marketing. These classes commonly include learning and assessment activities such as hands-on and collaborative activities such as business simulations, case-based learning, financial simulations, mock board meetings, marketing campaigns, or sales pitches. These activities often use team-based problem-solving, along with hosting guest speakers and some individualized activities which may be technology-based. In addition, leading school programs provide students with competitive career-based experiences via Future Business Leaders of America (FBLA) and/or DECA programs. These national organizations host competitions for middle and high school students in the aforementioned subject areas as well as in areas such as Parliamentary Procedure, Public Speaking, Retail and Sports Marketing, and Restaurant and Food Service Management.

Since there are often many small group activities within a business education classroom, care should be taken to minimize sound transfer from various parts of the room to others. The classroom's size and layout should allow for areas that facilitate brainstorming and discussions, such as flexible group tables or large whiteboards for visualizing ideas. Additionally, interactive spaces such as presentation zones or project corners allow students to demonstrate their findings, share business ideas, and practice presentations. To accomplish these varied activities, a combination of individual tables and seating and collaborative workspaces helps create an environment that supports both individual learning and group interaction. For instance, round tables or modular seating arrangements are ideal for facilitating group discussions and problem-solving exercises, which are key aspects of business education. These rooms, or an adjacent space to the classroom, should also be able to allow for simulations for the aforementioned competitions. Also, individual seating options would be supportive in facilitating specific software and technology certification processes.

Business education classrooms can involve long periods of seated work, such as using computers, reading case studies, or completing financial analyses. As such,

ergonomic considerations in the purchase of furniture such as adjustable chairs and desks that can help students maintain proper posture, are essential to prevent strain and fatigue during prolonged work sessions.

Due to the myriad of classes that occur within a business education classroom, there must be functional and organized storage solutions. These solutions are needed to manage various materials, resources, and technology-related equipment. Some of this equipment may need to be secured differently than other materials within the classroom.

Technology needs to be integrated into the classroom itself. It should also be available for student use to complete the coursework at hand. This can be achieved through digital tools such as spreadsheets (e.g., Microsoft Excel), business simulation software, and online research platforms. While the Wauwatosa School District is a 1:1 device district at the secondary level, some coursework may require specialized software. This software is loaded onto stationary devices within classrooms or onto devices that do not leave an assigned space with students. In addition to computers or laptops, digital displays beyond what general classrooms have are needed. These displays would support a range of activities, from digital presentations and business simulations to virtual collaboration. Moreover, the classroom should be designed with enough power outlets, internet connectivity, and wireless access to ensure smooth integration of these tools. Finally, classrooms should be designed with adequate natural and artificial lighting to reduce eye strain and promote focus with this increased reliance on technology for this programmatic area.

Additionally, care and consideration should be taken in regards to the teacher's instructional preparation area. Business education is part of the District's elective portfolio. Given this, the educator charged with teaching business education typically has to prepare for teaching a number of different types of classes (e.g. accounting, business law, business management, entrepreneurship, personal finance) all within the same day. Therefore, there needs to be space for the educator to have readily prepared and accessible instructional materials for the array of classes that they may teach in a given day. As with students, ergonomic considerations in the purchase of furniture such as adjustable chairs and a moveable "desk" for the teacher is important to maximize the flexibility of the space.

By taking into account the preceding features, along with those identified and generalizable to all basic classroom learning spaces in the building, business education classrooms can foster the development of essential business skills. These classrooms will also prepare students for future internships and careers in business-related fields.

English Language Arts. English and language arts (ELA) education plays a critical role in developing students' literacy, writing, speaking, listening, and critical thinking skills. The design of an ELA classroom is essential to fostering an environment where students can develop strong reading and writing skills, critically analyze language via listening, and practice presentational and speaking skills. The ideal design of an ELA classroom therefore incorporates a combination of flexibility, technology integration, comfortable reading spaces, and collaborative work areas.

ELA classrooms are active and involve a combination of independent reading time, whole-class discussions, conferencing with the teacher 1:1, small group collaboration, writing exercises, and presentations so that students can learn to read, write, speak and communicate effectively with others. Evidence-based development in ELA calls for word walls or anchor charts that allow for students' easy reference to key vocabulary or syntactical functions. Also, space is needed for classroom libraries that suit student learning needs and interests. Comfortable soft seating areas are necessary, as well, to be semi-acoustically separate so that teachers can conference individually with students. Additionally, individual home bases for writing activities are required.

There are three areas of specific emphasis for the District to plan for related to learning spaces according to the 2019 English Language Arts Audit. The first recommendation is that there is an increased focus on student-centered instructional practices–specifically "... increasing the amount of time students are engaged in reading, writing, and constructing their own knowledge socially" (p.3). This indicates a need for large enough classrooms to accommodate students doing a range of instructional activities including individual reading and writing, moving around the room to collaborate with their peers, space to create their own knowledge, and space to make their own meaning and connections with the text at hand. In addition, it was suggested that a vital next step to strengthen the ELA program was to build robust classroom libraries that provide choice and independent reading in an amount equal to approximately 30 distinct titles per student per classroom. To accomplish this within classrooms, space must be large enough to accommodate this quantity of books (based on average class size, well over 600 per classroom) and have proper safe storage to do so. The final recommendation was to provide professional learning on how to effectively confer with readers and writers to differentiate instruction and accelerate growth. This indicates the need for two types of spaces. One is within the classroom to allow for a teacher and student to have a semi-private conversation while other students are present. The second space is outside of the classroom; a space that allows for high quality professional learning to take place. Furnishings to support both aspects of this final recommendation must be taken into account along with acoustics. This is

so teachers and students can hear one another during conferencing, but others in the classroom may not be able to do so.

Taken together, the general teaching and learning activities within ELA as well as the specific next steps recommended by the ELA audit indicate a need for movable furniture ensuring that spaces can be reconfigured seamlessly since classrooms that support multiple learning modes fosters an active and participatory learning environment.

Taken together, the general teaching and learning activities within ELA, along with the specific next steps recommended by the ELA audit, indicate a need for movable furniture. This would support more seamless reconfiguration of the space. Classrooms that support multiple learning modes foster an active and participatory learning environment. This includes providing students with shared workstations or collaborative tables. These spaces allow students to discuss ideas, review each other's work, or engage in group reading, writing, listening, and speaking exercises. Such activities encourage interaction and peer learning. These spaces should include access to writing tools, technology, and reference materials.

Additionally, there should be designated zones within the classroom that create reading nooks. These nooks should be quiet, comfortable reading areas with soft seating or beanbags that can provide students with a space to immerse themselves in books. This area should be stocked with a variety of reading materials of different genres, encouraging independent exploration. Writing zones may also be designated and equipped with resources such as writing prompts, graphic organizers, and reference materials that support student writing.

To attain the classroom library recommendation, a variety of bookshelves, both open and closed, should be available to store classroom books, reading materials, and reference texts. These should be organized by genre, reading level, or theme to help students easily find texts that interest them. Additionally, there should be designated storage areas for writing supplies—such as pens, markers, paper, and notebooks—to help ensure that students can easily access the materials they need for writing exercises. Adequate power along with storage space for classroom-based digital tools and adequate access to power and chargers is essential for supporting technology integration in the classroom.

Additionally, consideration should be taken in regards to the teacher’s instructional preparation area. Teachers of ELA typically take in a high volume of student work and often have handwritten notes about their 1:1 student conferences in reading and writing. While much of it today is digital, handwritten work is still collected. Given the need for the classroom to reconfigure seamlessly to support multiple learning

modes, this should include the teacher's workspace. Oftentimes, a teacher's workspace is quite permanent thus creating barriers to room configurations. Therefore, the teacher's workspace too should be able to be reconfigured seamlessly to support different learning modes. To this end, when modeling text annotations, for example, teachers should not be confined to one part of the classroom. Rather, the teacher should be able to move flexibly while also projecting from a document camera or computer. This further reinforces the need for some sort of flexible workspace to be accessible to the teacher.

As pointed out earlier in the literature review, there are studies tying specific colors, lighting and aesthetic features to reading achievement. Attending to this research in the selection of wall colors and types of artificial light in the classrooms should be a part of any ELA classroom remodel or the creation of new such spaces.

By ensuring adequate classroom size to accommodate above desired instructional activities and approaches, classrooms can support the diverse needs of students and foster engagement in both reading and writing. Additionally, attending to features such as lighting, wall color, power and acoustics help create an environment where all students can thrive and develop essential literacy skills.

Family and Consumer Science. Family and Consumer Science (FCS) education provides students with practical knowledge and skills that help them manage personal, family, and community well-being. The FCS curriculum spans multiple disciplines such as culinary arts, nutrition, textiles, and healthcare. This hands-on programming is often provided to students by instructors who also have relationships with local technical colleges that can allow students to earn industry certifications via courses offered in high school. To do so, courses must meet rigorous standards. Therefore, the learning spaces for students must be able to support the skill-development required to pass the certification exams, and ideally excel in these courses. Furthermore, there are competitions for middle and high school students aligned to career pathways offered via national organizations within these areas such as Family, Career, and Community Leaders of America (FCCLA), Health Occupations Students of America (HOSA), and ProStart. Successfully competing in these events can lead to scholarships and/or admission to some post-secondary programs.

Within the broad scope of Family and Consumer Science course offerings, two specific domains—culinary arts and healthcare—require the most specialized classroom designs that accommodate hands-on technical learning in environments where safety is paramount and significant space is required.

Culinary arts education requires a highly specialized space that supports safe storage of food, cooking and food preparation, and instruction in food safety and safe cooking techniques. The design of a culinary arts classroom should reflect the complexity and intricacies of culinary education, providing students with opportunities to practice cooking techniques while staff maintain supervision via clear lines of sight.

The culinary arts classroom should be equipped with state-of-the-art kitchen appliances and utensils to facilitate hands-on learning with each station. These stations should be designed to mirror the layout and tools used in professional kitchens, thus enabling students to familiarize themselves with industry standards and be better prepared to earn the aforementioned industry recognized certifications. More specifically, workstations should include stoves, ovens, refrigerators, sinks, cutting tables, prep areas, and adequate exhaust systems to maintain a safe environment, especially with high-heat cooking. In addition, there should be clearly marked areas for food preparation, cooking, and storage to maintain health and safety standards. Each workstation should be clearly marked and sufficiently spaced to allow students to work safely and efficiently. Furthermore, safety equipment such as fire extinguishers, first aid kits, and safety signage should be strategically placed in the classroom to ensure student safety.

The layout of a culinary arts classroom must be carefully planned to allow for safe movement between stations while ensuring that students can practice cooking in an environment that replicates a professional kitchen. It is suggested to include islands or work tables where students can easily access their ingredients and tools while maintaining a clear path to exits in case of emergency. The arrangement should also enable teachers to monitor the entire class while moving around the space and providing hands-on guidance. Teacher demonstration areas that are supported by technology to broadcast the view to all students and/or use of mirrors must also be a part of the design.

Healthcare-focused FCS courses such as those related to child development, nursing, personal care, and first aid also require specialized classroom designs. These spaces need to be equipped with a variety of learning materials such as anatomical models, medical equipment, interactive technologies, medical-grade beds, and health assessment tools such as thermometers, blood pressure cuffs, and stethoscopes. Additionally, computers and tablets should be available for accessing medical research and participating in healthcare simulations. Furthermore, specialized spaces that simulate patient rooms, medical offices, or clinics give students real-world training experiences. These classrooms, therefore, must be large in size, provide visibility between spaces for supervision, have varied storage spaces for

instruments large and small, and have adequate power for the specialized equipment.

Furnishings in each learning space should be flexible and allow for group-based activities. Areas for students to work independently on assignments, review medical literature, and engage with technology are also necessary. Dedicated sewing tables with built-in storage help keep supplies organized, especially when projects take multiple days to complete and many students are using the same machines.

Long periods of standing, lifting, or repetitive movements can result in physical strain, particularly in culinary arts where students are working at stoves and countertops. Therefore, ergonomic furniture, such as adjustable stools or islands/tables, can alleviate discomfort and improve student engagement.

Both culinary arts and healthcare education require the integration of advanced technology to ensure that students are prepared for real-world careers. Interactive displays are essential for teaching concepts, reviewing medical case studies, or demonstrating cooking techniques. Furthermore, using virtual learning platforms or applications that support healthcare scenarios can enhance students' understanding of patient care and medical practices. For culinary arts, digital platforms can assist in teaching nutrition, meal planning, and dietary analysis giving students access to tools they will likely encounter in professional settings.

Since classrooms for culinary arts as well as healthcare-focused classes are hands-on spaces, it is important to consider teacher and support staff needs for instructional preparation areas in the design of these spaces. Often, there are multiple levels of these classes back to back in specialized classrooms throughout the day. There are minimal breaks in between for teachers or other staff members to prepare materials for demonstrations or to prepare for student utilization. Care must be taken to design spaces with ample cold storage and plenty of space for carts that can hold prepared foods, sample dishes, and half-finished meals that need to be saved for completion the next class period or day.

Culinary arts teachers in particular may need support in food ordering and delivery to make the job manageable. Consideration of the placement of culinary arts classrooms in the building should include being near an exterior wall and/or parking lot. This would allow for direct ventilation out of the building for hood vents, as well as ease of access for grocery deliveries. These features would support program efficiency.

The ideal design of a FCS classroom promotes safety, creativity, and collaborative learning. It also prepares students for careers in culinary arts, healthcare, and other related fields.

Mathematics. Mathematics education is central to fostering critical thinking, problem-solving, and analytical skills among students. The design of mathematics classrooms for grades 6-12 plays a pivotal role in supporting effective instruction, promoting student engagement, and facilitating various teaching methodologies.

Mathematics courses in WSD's secondary school range from 6th grade math to calculus. The main learning activities focus on the interactive posing and visualization of problem solving observed through rich student-to-student discourse. Said differently, the contemporary mathematics classroom should hum with student voices grappling to make meaning (National Council of Teachers of Mathematics, 2020).

Math classrooms are similar to general classrooms with the exception of needing more writable wall surfaces so that students can, either individually or in small groups, solve equations and showcase their learning with rapid opportunities for the teacher to check for understanding and verify skill attainment. To accomplish this, classrooms must be large enough to allow furnishings, which are suitable for individual and group work, to be away from walls so that there is adequate circulation space around the classroom. Similarly, space is needed for the configuration of regular collaborative, teamwork opportunities. According to the audit on mathematics conducted in the Wauwatosa School District during the 2024-2025 school year, of the classrooms observed, only 15% of them showcased opportunities for students to collaborate despite the fact that *nearly all* classrooms observed had student seating arranged in groupings. This stark difference poses an opportunity for reflection and curiosity - what additional barriers exist from the "third teacher" or are these conscious pedagogical decisions made by the educators in the spaces?

Moreover, individual student whiteboards and dry erase markers are also often used so that as students learn, any errors made can be quickly pointed out and just as quickly fixed. In addition, students may be provided with physical manipulatives, such as geometric shapes, measuring tools, or algebra tiles to help students conceptualize abstract math concepts and apply them in hands-on ways.

Storage space for math manipulatives, calculators, books, and materials should include drawers or cabinets to store these resources while ensuring easy access and be included in space design and furniture acquisition planning.

Mathematics education increasingly involves the integration of technology, as digital tools can help students visualize mathematical concepts, experiment with data, and engage in problem-solving activities. Interactive whiteboards allow teachers to present dynamic content, demonstrate mathematical solutions step-by-step, and interact with students in real-time. Interactive features can also enable students to manipulate variables and visualize abstract concepts, such as graphing functions or geometric transformations. Graphing calculators and software like GeoGebra or Desmos help students analyze mathematical problems and visually represent functions, making abstract concepts more tangible. Ensuring that seamless usage of these kinds of technology can occur and be viewed by the whole class is important.

The ideal design of a math classroom for grades 6-12 combines adequate classroom space for many students to be up and moving, technology integration, and storage to foster effective learning.

Performing Arts – Music. The design and features of music rooms in secondary schools are integral to the functionality and educational outcomes in music programs. National and state music standards center around the four Artistic Processes of creating, performing, responding and connecting (National Association for Music Education, 2020). Music classrooms for band, choir, orchestra, and general music need tailored architectural and acoustical designs to meet the specific needs of the instruments and teaching styles associated with each type of ensemble. An effective design does not solely focus on the educational environment but also considers the wellness of both students and teachers. It accounts for the physical demands of long rehearsal and performance sessions and incorporates best practices in fostering musical development, creativity, and collaboration. Key considerations include acoustics, space layout and storage solutions, ergonomics, technology, and teacher-student interaction. (National Association for Music Education, 2020).

Band and Orchestra Rooms

Band and orchestra rooms are intended to accommodate stringed instruments as well as wind, brass, and percussion instruments. All of these produce sound with different frequency ranges and intensities. As wind and brass instruments typically generate loud, penetrating sounds, controlling sound reflection and absorption is crucial in band room design. Therefore, a band and/or orchestra room should have ample space with high ceilings to support sound distribution, allowing the sound from brass and percussion instruments to fill the room without excessive reverberation (National Association for Music Education, 2020). Furthermore, the National Association for Music Education (2020) recommends that instrumental rehearsal rooms such as these contain at least 1,800 square feet of floor space with a ceiling height of at least 16 feet and a double-entry door. The organization further

recommends practice rooms in the size of 55 square feet for every 40 students enrolled in the program.

Proper storage in band and orchestra rooms is crucial. Instruments such as tubas, trumpets, drums, cellos, and saxophones require significant space while there are much smaller instruments to consider as well. These rooms need secure, easily accessible storage for bulky percussion instruments (e.g., bass drums, cymbals) as well as wooden and wind instruments that must be kept safe and in optimal condition. Moreover, air quality–specifically humidity levels–must be controlled in these storage areas to prevent damage to the instruments.

Acoustic comfort is essential for maintaining teacher and student health. Long periods spent in rooms with high sound intensity can lead to hearing fatigue or even hearing damage. Band rooms with high levels of reverberation can cause hearing discomfort and potential loss, particularly for conductors who often stand in the direct line of sound exposure. According to the National Association for Music Education (2020), each room should be isolated by an acoustic barrier or wall with a Sound Transmission Classification (STC) of 50 or more with lighting and ventilation systems having Noise Criterion levels of 30 or less. Sound absorption materials, such as acoustic panels or foam on walls and ceilings, should be used to reduce echo and reverberation. Diffusers should also be incorporated to scatter sound waves evenly and improve sound clarity across the room. These elements should be designed into band and orchestra spaces. In addition, the room shape and size should enhance the acoustics of the space. Careful attention to the overall building layout and mechanical design can help properly isolate the acoustics, preventing sound transfer into or out of the space.

Furthermore, seating arrangements must ensure that students do not experience physical strain due to standing for long periods. This is especially true for percussionists, who often endure repetitive physical movements. Ergonomic seating, such as adjustable chairs for wind players and percussionists, can alleviate strain and improve posture during rehearsals. All students should have music stands that are adjustable, ensuring that students can read their music comfortably while maintaining good posture. Chairs should be sturdy, comfortable, and adjustable, allowing students to sit with their feet flat on the floor and their backs straight. Designing the HVAC system to allow for a comfortable climate is essential for maintaining focus and ensuring well-being, especially since these rehearsals often involve physical exertion. THe National Association for Music Education (2020) recommends an air-exchange rate double that of an ordinary classroom.

Technology should be thoughtfully included into the design of the band spaces such that digital displays are visible from multiple points within the room. This may require multiple displays to accomplish this. Additionally, many band and choir

directors like to use video and/or audio recording equipment for student self-assessment and feedback and/or music software for composition, theory exercises, and ear training. Storage may be needed for metronomes and tuners to aid individual practice and improve ensemble precision.

Room design should also take into account sightlines for rehearsal such that the director has unobstructed views of all students. This enhances interaction and non-verbal communication as well as ensures that small group areas or individual practice spaces are integrated into the space with visibility for supervision and safety. Additionally, as Roseth (2019) explains, large ensemble teachers, such as those in band, orchestra, and choir, should leverage proximity more than just verbal and non-verbal cues and directives with students for the most effective instructional impact. The barrier to doing so in many band and orchestra classrooms is the space within the room and lack of adequately sized storage that can be used by students for backpacks and instrument cases. This is important so that students and teachers are free from barriers and trip-hazards.

Choir Rooms

While many of the aforementioned considerations around sight lines, ergonomic considerations and thermal comfort are the same as band and orchestra, there are some differences between instruments and vocal performance and how the sound travels.

Choir rooms should be designed specifically for vocal music, which requires a distinct approach to acoustics. Per the National Association for Music Education (2020), choir rooms should be at least 1,200 square feet of floor space with a ceiling at least 14 feet high, with a double-entry door. The organization further recommends practice rooms in the size of 55 square feet for every 40 students enrolled in the program. As vocal sounds are softer than those produced by instruments, a choir room should include sound-reflective surfaces to promote vocal projection and clarity. As such, reflective surfaces should be positioned to prevent sound distortion and create a balanced room reverberation that enhances vocal harmonies. It is important to diffuse acoustic treatments to prevent echoes, as excessive reverberation can confuse the clarity of choral voices.

Storage in choir rooms is less complex than in band or orchestra rooms, as the primary focus is on music stands, sheet music, and smaller vocal-related items. However, ample storage for choir robes, music folders, and podiums is necessary.

In choir rooms, vocal performance demands proper posture to avoid vocal strain. Therefore, the design should ensure that the seating allows singers to stand and sit with proper body alignment. Using tiered risers is a critical feature, as it supports students' posture and vocal projection. Acoustic comfort also contributes to teacher

and student wellness. Excessive noise levels can lead to vocal fatigue for teachers who must project their voices over large groups. Acoustic treatments, such as soundproofing and the strategic placement of diffusers, help manage noise levels and reduce the vocal strain on both students and teachers. Final design features unique to choir include proper ventilation since the instruments being played are peoples' voices and climate control. Just as with ensemble rooms, the National Association for Music Education (2020) recommends an air-exchange rate double that of an ordinary classroom. Ample space for students to stretch and access to water fountains or bottle fillers is also crucial for student and staff hydration and convenience.

General Music Rooms

In addition to band, choir and orchestra, general music is offered 6-12. This course is a melding of some instrumental play–such as electronic keyboards, ukuleles, triangles, drums or other smaller instruments, some singing, digital music creation, and music theory. As such, this space requires acoustical considerations, storage for myriad instruments of varying shapes and sizes, audio and video recording, playback equipment, and space for physical movement (National Association for Music Education, 2020).

Creating effective music rooms for grades 6-12 is a crucial component in ensuring the success of music education programs. These rooms are not only a space for musical practice but also a space where students learn about music theory, musicianship, and collaboration.

Performing Arts – Theater. Performing arts education, encompassing theater and drama, requires substantial specialized and dedicated spaces. These include performing arts spaces such as theater classrooms, drama studios, and performance venues. Additionally, areas designated for set design, set storage, costume storage, dressing rooms, and the sound and lighting needed to bring performances to life are essential. As such, there are considerations beyond other spaces within the school building that merit consideration in the *Analysis of Learning Spaces*.

Key among the special considerations for theater and drama department spaces is the overall spatial layout. This can include singular rehearsal and performance spaces, or a larger performance venue with considerably smaller rehearsal spaces. There could also be multiple venues such as a Performing Arts Center as well as a Black Box Theater. Many factors go into determining the size of such a performance space including school enrollment, community population, and any special partnerships or agreements with outside organizations that would impact seating and overall performance size determination.

Once the size is determined, work to design interior spaces for everything from costume and makeup storage to dressing rooms and sound and lighting booths commences. It is during this process that acoustics and the purchase of correctly tuned sound and lighting displays get decided according to desired price point. The design should incorporate materials that allow for controlled sound reflection and absorption and according to the National Association for Music Education (2020). Additionally, this space should be isolated by an acoustic barrier or wall with a Sound Transmission Classification (STC) of 50 or more with lighting and ventilation systems having Noise Criterion levels of 20 or less (National Association for Music Education, 2020). For example, acoustic panels, carpets, and drapes can help manage sound reflections and reverberation to ensure clear audio transmission for both actors and audiences. The ability to adjust acoustics for different activities (e.g., speech exercises, musical theater, etc.) is valuable for enhancing learning and performance and should be a sought feature in the procurement process.

Lighting design should provide flexibility for both day-to-day rehearsals and public performances. Proper lighting is crucial for creating moods, enhancing visual storytelling, and ensuring safety during performances. A combination of general and task lighting, along with specialized lighting (spotlights, floodlights, etc.) can be used to create different lighting conditions. The use of dimmers and adjustable lighting systems enables teachers and students to adjust the atmosphere based on the activity. For example, bright lighting may be used for rehearsals or script readings, while darker lighting may be used for performance work.

Additional considerations for technology include the use of cameras and projectors which allow students to record rehearsals, watch playback, and critique their performances.

The safety of students and instructors in performing arts spaces is paramount. Since drama involves physical movement, stagecraft, and live performances, safety considerations are vital to prevent accidents or injuries. Safety features to consider in space design include non-slip flooring, clearly marked exits or other required safety equipment for protocols, and a fully accessible space for both students as well as visitors to enjoy the performances. Related to safety are designated areas for physical warm-up exercises and stretching to help students avoid injury and prepare their bodies for the demands of acting or physical theater.

Stage Crew and Set Design Considerations

For most school performances, there is a stage crew that executes set construction and ultimately tears it down and removes or stores the set, or parts thereof, following the conclusion of the production. Thus, it is crucial to consider this activity in the space when analyzing these theatrical and dramatic areas.

Stage crew work includes the use of specialized equipment and a safe, organized workspace, much like what is written in the next section for technology education (TE). Stage crew uses construction materials and needs space, lighting, power, and ample storage areas to ensure safe set design and construction activities. A separate area for storing tools and technical equipment is crucial for preventing clutter and ensuring that stage crew members can easily access the necessary tools during rehearsals and performances, but that those who should not have access to them do not for safety reasons. In some instances stage crew members may wish to use computer software to assist in the set design and/or have design table areas much like in TE. This should be discussed during the design phase of this space to see if the TE area could be a shared space for this purpose or if an additional space within the performing arts portion of the building should instead be constructed and stocked with tools.

Regardless of the area for some of the design and initial work, there will need to be adequate space for bringing into the stage area materials, building, assembling, and painting set pieces. The workshop should be large enough to accommodate several sets of construction projects at the same time with tall double doors or overhead doors (LaRue, 2023).

Classroom Space

In addition to the large performance venue, there is likely at least one separate and dedicated performing arts classroom which should have a flexible layout to support a variety of activities, including rehearsals, performances, improvisation exercises, collaborative work, and individual practice. According to Norton as cited in LaRue (2023) a typical drama classroom should be a "space designed for performance, not just a classroom where desks are pushed out of the way" (p.66). Thus it is recommended that the 'classroom' resemble a black box theater with the scale of a classroom that can be painted black to resemble performance spaces and allow a variety of configurations, including a traditional classroom setup, an open rehearsal area, and a performance space. The use of movable furniture and partitions allows for quick reconfigurations and a clear, open floor area with a wall of mirrors and curtains is necessary for physical theater, choreography, and improvisational exercises. Sound and lighting should also be considered within these spaces to provide a more realistic teaching and learning environment that simulates performance.

Designing performing arts spaces includes consideration of the performance, rehearsal (often classroom), set-building, and storage spaces tied to the activity. These spaces must be flexible, well-equipped, and designed with attention to acoustics, lighting, technology, safety, and storage in order to maximize the investment in the program and spaces.

Physical Education and Health. The design of Physical Education (PE) and Health Education classrooms for grades 6-12 plays a critical role in fostering physical activity, positive attitudes about health and wellness, and well-being among students. The learning environment must facilitate active engagement, health education, and fitness activities while promoting safety, inclusivity, and wellness.

Health Classrooms

Health classes focus on all facets of health and wellness and are taught by licensed health educators within a classroom setting. This is unlike PE classes which focuses on gross motor skills and are usually taught in a large learning space such as a gymnasium or fitness center with cardio and weight machines. Due to the nature of health coursework in grades 6-12, there are no considerations for the class meeting space beyond those for a general classroom with the exception of when CPR and/or AED training is administered and students need a larger space for hands-on training.

Physical Education

Physical Education (PE) classes are usually held in gymnasiums. Some PE courses need special equipment that is logically placed adjacent to the gym, or fitness centers (or rooms) at 6-12 schools (Nair, 2019). While overall these large spaces are needed due to the size of equipment and nature of the physical activity, these spaces can present acoustical, storage, and safety concerns that should be considered during the design of these spaces.

According to the Society of Health and Physical Educators (2022), also referred to as SHAPE America, the PE classroom, most often a gymnasium, should provide 110-150 square feet per child to allow for movement. This should also include space for students to engage in physical activities like team sports, individual fitness routines, and motor skill development exercises. It is further recommended that gymnasiums are minimally 54' x 90' feet with an additional 10 foot buffer zone for safety (SHAPE, 2022). If the gymnasium serves other purposes during the school day, it should have things such as lunch tables, milk coolers, cash registers, or other materials moved out of the space prior to the commencement of class with the floor cleaned and dried for safety. Additionally, consideration of the type of flooring and markings for various games should also occur for both long-term care, ergonomic, and safety reasons.

This need for adequate space for the aforementioned activities was underscored by the PE audit conducted during the 2024-2025 school year. In particular, the audit named concerns at the middle school where multiple PE classes are held simultaneously in the limited gym space, thus creating a chaotic environment and limiting educators' instructional impact and effectiveness. Furthermore, with many students being in a large open space at once, often acoustics become a concern both for how well students can hear and understand their teacher in the space and

for the teacher who is straining their voice to project in the space. During a game or workout, inadequate acoustics or unaided vocal support can lead to safety risks if students cannot hear directions during an activity or school safety event. Moreover, poor acoustics could lead to bullying and inappropriate student remarks and behaviors not being heard or dealt with immediately and firmly thereby creating a negative learning environment (Society of Health and Physical Educators , 2009). For health and safety reasons, gyms and fitness rooms/centers should be designed with easy to use microphones/sound systems so that these concerns are properly mitigated.

Similarly, site lines and ensuring that items – including large bulky and heavy equipment - can be stowed completely out of the path for other students is essential to mitigate the risk of injury. Sufficient storage is necessary for housing a wide range of sports equipment, such as balls, nets, weights, mats, and other tools. Society of Health and Physical Educators (2022) recommends a minimum of 400-600 square feet of storage space with a minimum height of 10 feet is secured for this purpose. Storage spaces should be designed for easy access and organization, ensuring that equipment is safe, well-maintained, and ready for use. In both PE and health education spaces, it is essential to have clear signage indicating emergency exits, safety equipment locations, and the boundaries of activity zones. Proper safety protocols, including fire drills and first-aid stations, should be incorporated into the design. Additionally, accessibility for students with disabilities is a vital consideration to ensure that all students can safely participate in PE and health education programs.

PE spaces should be equipped with technology to facilitate interactive learning, such as interactive whiteboards or multimedia projectors to display health-related videos, charts, and simulations. However, having the right technology and enough screens so that all can see what is on display requires careful planning. These systems should be wired into the acoustic system to ensure that they can also be heard.

Furthermore, wearable technologies that teach specific fitness knowledge may also complement specific lessons or units such as pedometers, heart rate monitors or other personal devices to monitor effort during class (Society of Health and Physical Educators , 2009, Society of Health and Physical Educators , 2023). Space to store, properly cleanse, dry, and display for next student usage must be considered in storage and space planning.

While natural lighting in gym and fitness areas can be problematic if it cannot be well regulated, adjustable lighting is important to create a conducive learning environment for different types of lessons. This includes but is not limited to lectures, group discussions, or video screenings. Dimmable lights allow for flexibility and can help students focus or relax depending on the activity or see technology

presentations better. Society of Health and Physical Educators (2022) recommends that gymnasiums be lit, “to a minimum of 35 foot-candles, and free from shadows” (p. 9).

Finally, to promote a fully inclusive environment, gymnasiums should also include wall display areas that contain pictures and other visual cues for students who may need these to fully participate in the class. The ideal design of PE and health education classrooms for grades 6-12 must prioritize flexibility, safety, accessibility, specialized areas, and wellness. PE spaces should be designed to facilitate a variety of physical activities and promote active learning, while health education classrooms should provide an environment conducive to discussion and hands-on learning. Well-designed PE and health education classrooms will not only enhance students' academic success, but also contribute to their overall well-being and long-term health in a safe manner.

Science. In their text “A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas”, the National Research Council (2012), part of the National Academy of Sciences, emphasizes the importance of well-designed science classrooms in fostering essential scientific practices. According to their framework, effective science education encourages students to engage in key practices such as asking questions and defining problems, constructing explanations, and designing solutions. Additionally, students should develop skills in engaging in argument from evidence, developing and using models, and analyzing and interpreting data. Other critical aspects include using mathematical and computational thinking, planning and carrying out investigations, and obtaining, evaluating, and communicating information. These practices should take place in a safe and supportive learning environment, ensuring that students can explore scientific concepts in a meaningful and structured manner.

The Minnesota Department of Education (2018) recommends science classrooms be positioned on an outside wall to help vent fumes with access to an outdoor environmental area with classrooms including portable tables, sinks, electricity and heat along with student work space. Additionally, per the National Research Council (2006), consideration must be given to supplies and equipment of all types. This includes instruments for measurement and data collection, access to technology, and facilities that support prolonged work on projects. More broadly, districts need to consider space use, coupled with the above mentioned content-specific items, which can mean that quality science teaching is more expensive than other subjects (National Research Council, 2015).

The Wauwatosa School District hosts a variety of courses ranging from general exposure to biology, chemistry, and physical sciences in the middle school to more

concentrated learning of similar content areas and extended content areas at the high school level. Thus, the need for flexibility in lab design is paramount due to the diverse range of scientific subjects typically taught.

For instance, a biology lab might require movable tables to facilitate hands-on experiments, dissections, and group activities. Storage cabinets with adjustable shelves are essential for accommodating specimens, microscopes, and other equipment, as well as access to refrigeration and sinks.

In contrast, a chemistry lab necessitates robust countertops resistant to chemical spills and heat, along with fume hoods for safety during experiments involving volatile substances. Mobile storage carts equipped with locking mechanisms are ideal for storing chemicals and lab supplies securely while allowing for easy reconfiguration of the space for different experiments.

Physics labs often benefit from open floor plans that enable the setup of various equipment configurations for experiments on motion, optics, and electricity. Adjustable-height tables or benches accommodate students of different heights, mobility ranges, and facilitate collaborative work on projects requiring assembly or construction.

Environmental science labs may require specialized equipment for soil and water testing, necessitating designated workstations with easy access to utilities such as water and gas lines. Flexible storage solutions, such as modular shelving units or mobile carts, accommodate samples, field equipment, and research materials, allowing for seamless transitions between indoor and outdoor activities.

Additionally, variations within scientific disciplines should be noted. Science classrooms often include co-located labs, flexible seating, and mobile workstations for easy reconfiguration.

The classroom should be designed to maximize visibility. This includes clear sight lines between students and the teacher, while maintaining enough space for students to interact with each other and engage in hands-on activities. Ensuring each student has a direct line of sight to demonstration areas or interactive displays is also important. This promotes active engagement, minimizes distractions, and can improve safety when the student attempts to replicate the experiment on their own. Technology can also enhance this. Therefore, digital displays around the room should be included so that students can see digital instructional materials clearly, display their own lab findings, and compare data with other students.

Safety is a primary concern in science classrooms and lab spaces, particularly in middle and high school settings. As noted by West et al. (2003), designing science

spaces with safety in mind is critical to ensuring that students can work independently and confidently while minimizing risks. This includes having safety equipment readily available that students are trained to use such as eyewash stations, fire extinguishers, safety showers, and first-aid kits. The layout of the classroom should also provide clear, unblocked exits in case of an emergency. These safety best practices also require a larger footprint for the classroom/lab space and should be considered during design.

Further, science classrooms, which often involve demonstrations and group discussions, require effective acoustics to ensure clear communication which can also impact safety. Similarly, appropriate task lighting to see in detail during experiments is essential for both instructional purposes and safety. Lab stations should have adequate power so that lab instruments can be used when they are reliant on power sources for data collection. Nair (2014) recommends power to be sourced from the ceiling grid so as not to drag cords and cables through experiments or have them resting in water or potentially chemicals.

Paramount to safety is also ample, clearly labeled storage space for tools, chemicals, and lab materials. Lab stations should have built-in cabinets and drawers for storing equipment securely, as well as easy-to-reach areas for students for frequently used materials. These storage spaces must be flexibly configurable to accommodate their actual usage. If they are generically sized, specialty science equipment may not fit within the storage. As a result, the space may not be well-utilized, leading to materials remaining on countertops or requiring extra carts. This, in turn, can create safety hazards. For specialized equipment like microscopes, Bunsen burners, or lab glassware, incorporating mobile storage units can be beneficial. These units can be moved to different areas of the lab as needed. Additionally, they can be swapped between class periods, providing the necessary flexibility. This also helps to ease teacher transition time, Again, it is critical to ensure that these items are sized for the materials to be stored therein.

The ideal design for a science classroom and laboratory for grades 6-12 involves creating a flexible, safe, and well-equipped environment that supports theoretical learning,hands-on experimentation, and active discussion between students and staff.

Social Studies. Students learn about the world and study its people via social studies courses which range from the study of ancient civilizations to modern day government and civics. In Wauwatosa, the social science of Psychology is integrated into the portfolio of offerings within high school social studies programming. To facilitate teaching and learning, special considerations for a social studies classroom would include ensuring adequate technology. This would allow the use of virtual field

trips and interactive simulations, such as Google Expeditions and iCivics. These tools help bring historical sites, geographical locations, and cultural experiences into the classroom. Additionally, display areas for primary source documents, art, and images from different cultures should be provided. Timelines, maps, and other visual aids should also be displayed full-time to aid in learning (O'Mahony & Siegel, 2008). Doing so can offer students an immersive learning experience beyond what textbooks and readings can do.

Furthermore, the Wisconsin social studies standards call for civic engagement and student inquiry, including opportunities for students to explore their own questions and interests. Similar to the ELA classroom, the needs of a space dedicated to social studies instruction is quite similar. Social studies classrooms should be active spaces and involve a combination of independent reading time, whole-class discussions, small group collaboration, and presentations. As such, incorporation of movable furniture assists in supporting spaces that can be reconfigured seamlessly. Classrooms that support multiple learning modes fosters an active and participatory learning environment. This includes providing students with shared workstations or collaborative tables where they can discuss ideas, review each other's work, or engage in group reading, writing, listening and speaking exercises that encourage interaction and peer learning. These spaces should also include access to writing tools, technology, and reference materials.

Additionally, given the need for the classroom to reconfigure seamlessly to support multiple learning modes, this should include the teacher's workspace. Oftentimes, a teacher's workspace is quite permanent thus creating barriers to room configurations. Therefore, the teacher's workspace too should be able to be reconfigured seamlessly to support different learning modes. To this end, when modeling text annotations of a primary or secondary source, for example, teachers should not be confined to one part of the classroom. Rather, the teacher should be able to move flexibly while also projecting from a document camera or computer. This further reinforces the need for some sort of flexible workspace to be accessible to the teacher.

During the 2023-2024 school year, WSD conducted a curricular audit of social studies in grades K-12. For the purpose of this report, the scope of the discussion of the findings and recommendations will only focus on middle and high school. Within the findings, particularly from high school students, there was an urgent call for a more student-centered, inquiry-based learning approach. Students' perspectives is that their time in social studies class is largely spent listening to lectures and completing note packets. This is a striking juxtaposition as *nearly all* high school teachers reported using effective practices, including inquiry-based learning. During the classroom observation stage of the audit process, the auditor noted a high

frequency of teacher-centered instruction with the caveat that the classroom visits only represent a snapshot in time. Given all of the findings, the recommendation most salient to this report is for there to be a greater emphasis on inquiry-based social studies instruction. Despite the obvious that the auditor and the educators surveyed may have different definitions of effective practices and inquiry learning - which is called out in the audit report - the students' perspective cannot be ignored. They perceive their social studies learning experience to be teacher-centered. Assuming that the educators are well versed in student-centered learning as they report, then what is the barrier to implementing such pedagogy? Could the answer, in part, be connected to the instructional functionality of the classrooms?

Special Education. As noted in the 2022 Special Education and Student Services Audit of the Wauwatosa School District, "students with disabilities receive the majority of their services in an inclusive environment, which is a testament to the work the district has done to create opportunities for students with disabilities to engage with their typical peers in a general education setting with high expectations" (p.7). Furthermore, the audit noted that, "district facilities were felt to be a strength by family and community focus group participants" (p.8). As a result of WSD's inclusionary practices, the primary focus of this analysis and report is to shine a light on the current state of the universal classrooms and overall building supports for students with individualized education plans. One of the final recommendations in the audit stated, "further consideration should be given to a universal system of support including UDL, differentiated instruction, personalized learning, culturally responsive practices, in light of Teaching and Learning audit" (p.20). UDL stands for Universal Design for Learning. Novak and Rodriguez (2023) state that, "UDL is a framework for designing learning experiences, so students have options for how they learn, what materials they use, and how they demonstrate their learning" (para, 1).

Built environments that support UDL have a variety of learning spaces to allow for these learning options and storage of these varied materials. This can range from small break-out rooms to quiet sensory spaces to adjacent outdoor learning areas. As Mercy (2024) describes, UDL requires the removal of barriers to learning which means they must seamlessly serve the changing needs of the user. This is accomplished by lightweight, varied moveable furnishings, accessible dry-erase writing surfaces, stored materials and supplies within reach, inclusive technology, and integrated sensory experiences that do not overwhelm.

However, the FST recognized that there are times in which the least restrictive environment for a student with a disability is not within the universal classroom space alongside their peers. Therefore, spaces currently designated to support students' specially designed instruction, including spaces that serve as supportive testing environments were assessed as a part of this study. Due to its universal

applicability, the language of the English Language Arts rubrics were used for the special education resource spaces. For the spaces that support vocational studies, the rubrics that support the family and consumer science content area based on the similarities between the purpose of these two settings.

It must be further noted that the FST recognizes the unique, individualized needs of students that receive special education services. To account for all of the possible individualized needs is beyond the scope of this study. The FST further recognizes that it is the legal responsibility of the District to respond to any unique individualized needs of an individual student. Again, it is beyond the scope of this study to account for the wide variance of unique needs that must be legally provided to students related to facility needs. These needs are addressed as needed for the individual student.

Technical Education (TE)/Science Technology Engineering & Mathematics (STEM). Creating an ideal design for technical education classrooms and workshops for grades 6-12 requires a careful balance between functional layout, technological integration, safety, and overall school site design. Site design can support patronization of student work via easy parking and access to student-run businesses selling products as well as facilitate appropriate delivery of large resources and materials and service entrances based on the types of programming offered. It can also take into account facility visibility, which, along with parking, is one of the key elements to community recognition and support of the programs. Flexibility between indoor and outdoor spaces allows for varied activities, some of which should be done completely outside for air quality or other practical reasons.

High School

The Wauwatosa School District currently offers the following Technical Education courses at both high schools: Woods I, Woods II, Fab Lab I, Fab Lab II, Civil Engineering & Architecture, and Entrepreneurship. The following courses are only offered at Wauwatosa East High School due to space constraints for access to all necessary equipment: Construction I and Construction Capstone. Similarly, the following courses are only offered at Wauwatosa West High School due to the same barrier - space: Introduction to Power Technology and Metals. Said succinctly, Wauwatosa East hosts the construction pathway under Technology Education and Wauwatosa West houses the manufacturing pathway. Additionally, both high schools offer these three Project Lead the Way (PLTW) courses: Introduction to Engineering Design, Principles of Engineering, and Aerospace Engineering.

Based on the 2022-2023 TE audit, considerations and next steps were identified related to facilities (pp. 38-39). With that in mind, next steps identified for East High School are to:

- Ensure classrooms are available and are directly accessible to shops with suitable furniture;
- Develop a technology plan to address the dated computer lab: computers struggle to run required software; and
- Ensure courses are equipped with all supporting materials and equipment prescribed by PLTW.

Steps identified for West High School are to:

- Ensure all labs are fully functional and organized including:
    - Address the storage shortage as this can lead to safety concerns;
    - Finish the wall between the manufacturing lab from unfinished wall between the labs with plywood or drywall to at West to prolong lifespan of machines within;
    - Add additional power outlets to minimize extension cord usage;
    - Develop a technology plan to address the dated computer lab as the computers struggle to run required software; and
    - Ensure courses are equipped with all supporting materials and equipment prescribed by PLTW.

It was separately noted that there could be an effort to increase transportation efforts between high schools to bolster enrollment and provide more opportunities for students. If this were to come to fruition, there could be an impact on facilities needs in two ways to support the influx of the number of students:

- program space; and
- an easy and secure building entry for students commuting to lessen the impact of travel time on coursework.

In addition to the specific next steps identified via the audit, these courses also all have the following needs in common:

- The need for a “clean” classroom space; and
- The need for or introductory concept attainment with an attached or adjacent hands-on laboratory to practice what is being learned.

These areas should have flexible furnishings that allow for individual and group work as well as the standard technology for the District.

In addition, essential safety features are universally needed such as:

- In workshops involving woodworking, metalworking, or automotive repair, robust ventilation systems are necessary to remove dust and fumes, thereby safeguarding student health. Dust collection systems and exhaust fans are vital in these environments (Nair, 2014).
- Non-slip, durable flooring is necessary in areas where students handle heavy tools or equipment to prevent accidents, particularly in workshops and laboratories. This is especially important in high-traffic areas where movement is frequent, such as areas used for construction or automotive projects.
- Safety barriers and shields are necessary around dangerous machinery, such as CNC machines, welding stations, or lathes, to prevent accidents. These features are vital for ensuring the safety of both students and staff.
- TE workshops are often noisy due to the operation of machinery. To mitigate this, the room should be designed with soundproofing materials, such as acoustic panels or baffles, to reduce reverberation and absorb excess sound and also have ear protection and its storage easily accessible.
- Lighting is especially crucial in TE classrooms, where precision is often required for tasks such as reading technical drawings or operating machinery. Proper task lighting should be incorporated into workspaces to ensure clarity and reduce eye strain. Additionally, natural light can enhance the overall mood and productivity of students, though it should be balanced with artificial lighting to ensure visibility at all times (Nair, 2014).
- High-quality, durable work surfaces are essential for TE classrooms. These surfaces should be resistant to wear and tear from tools and chemicals, with plenty of space for students to lay out materials and plans.

Furthermore, clear site lines between classroom and lab spaces, as well as within each space must be created and maintained for student safety at all times. Proper storage is critical in TE classrooms and workshops to ensure that tools and materials are easily accessible and well-maintained. Organized storage prevents clutter, ensures safety, and extends the lifespan of equipment and materials. Effective storage solutions also minimize distractions and allow students to focus on their tasks (Nair, 2014). Dedicated storage areas for tools and equipment are necessary to ensure that students can easily access what they need while maintaining order in the classroom or workshop. These storage units should be lockable to prevent misuse and accidents. In addition to storing tools, TE classrooms and workshops must also have appropriate spaces for raw materials such as wood, metal, plastic, and fabric. These materials should be organized by type and kept in a secure area to prevent damage.

With the variation in courses offered and continuously evolving technology, beyond a strong infrastructure in technology and the aforementioned computer upgrades

needed, general classroom standards for technology displays can function well in these spaces. Additional technology equipment considerations include Virtual and Augmented Reality (VR/AR) technologies which can offer immersive learning experiences, allowing students to explore complex engineering concepts and models in a virtual environment, and working with industry partners to establish what course-specific fabrication tools such as 3D printers, laser cutters, and CNC machines are needed for these courses.

Storage was mentioned in future recommendations, but the need to attend to storage needs at the beginning of designing spaces for TE cannot be underscored enough. The quantity of materials needed and the scale of them to facilitate class means that adequate storage must be provided so that work areas are clean, safe, and site lines within the lab areas are kept clear for supervision purposes.

Middle School

At the middle schools, the suggestion is to ensure courses are equipped with all supporting materials and equipment prescribed by PLTW to facilitate the courses. At the time of this study and report, the District offers the following courses at both middle schools related to PLTW: Design & Modeling, Automation and Robotics, and Flight and Space, Magic of Electrons. Being introduced in the 2025-2026 school year is Coding & Game Design and Urban Farming. These courses are part of the District's initiative to make STEM learning accessible to more students which was a call to action from the STEM audit conducted over the course of the 2023-2024 school year.

Furthermore, at the time of this study and report, both middle schools offer STEM programs in grades 6-8 via student lottery. However, as a result of the findings and recommendations from the aforementioned audit, the middle school STEM program is being phased out beginning in the 2025-2026 school year. As it pertains to the facilities that currently support these programs, the following were reported through auditor observations and/or interviews with students, staff, and families. This includes:

- STEM classrooms were described as dirty, with inadequate cleaning and maintenance;
- Lack of windows in a contained environment in some STEM classrooms;
- Limited physical space and inadequate infrastructure for dedicated STEM activities, such as labs and maker spaces, hinder the ability to provide an immersive and hands-on STEM learning environment; and
- Absence of hands-on engineering laboratories and makerspaces for student formal and informal engagement with fabrication, design, robotics, and other fundamental engineering disciplines.

When students, staff, and families were asked to describe their ideal state related to the facilities to support STEM learning they responded with the following:

- A dedicated standalone building allowing for a high level of academic integration, particularly in science and math; and
- An outdoor education to enhance learning experiences.

The ideal design for TE classrooms and workshops for grades 6-12 requires careful attention to safety, specialized equipment, and technology integration. By prioritizing student safety, engagement, and real-world applicability, these classrooms and labs can offer dynamic learning environments that foster career readiness and professional skill development.

Visual Arts. Research by Seidel et al. (2009) highlights the nexus between perceptions of the quality of an arts program and the environment provided for it. In fact, one of the four dimensions of quality is through the Lens of the Environment. “This environmental lens reveals elements of the physical environment, including the actual space in which the learning takes place, the materials that are available, and the visible display of artworks and art-making materials” (Seidel et al., 2009, p.42). Additionally, it includes the functional and aesthetic space and materials with the arts classrooms occupying a central place in the building. The need for sufficient time for authentic artistic work, including space to store in-process projects, is critical. The researchers further highlight that physical safety needs to be tended to in the arts. This includes adequate ventilation for working with paints and other materials with chemical bases. Additionally, other functional aspects, such as lighting, sound, space for running water to clean brushes, and the display of student artwork, communicate the importance of the arts and the value placed on student work.

The visual arts program encompasses several disciplines, including drawing, painting, ceramics/sculpture, metalwork, photography, and digital media. Each of these areas requires specific materials and supplies, as well as careful attention to spatial and material maintenance. In addition to organizing these resources for art-making, teachers must also prepare the physical classroom space for students (Seidel et al., 2009).

Proper lighting is essential for all visual arts disciplines. Ideally, a combination of natural and task lighting should be used, and work surfaces should be durable, spacious, and resistant to wear. Tables should ideally be moveable for cleaning, though stability should be prioritized to prevent disruptions during detailed, delicate technical work.

Effective storage is vital in an arts classroom. Materials such as paints, brushes, and sketchbooks should be organized and securely stored, while high-value items like digital devices may require lockable storage. Individual students should have personal spaces for storing projects, and communal areas for collaborative work are necessary. Waste and recycling should be managed efficiently to maintain a clean and sustainable studio.

Lighting and acoustics should support various tasks like drawing, painting, and digital design, while acoustic treatments like sound-absorbing panels can help minimize distractions. Technology should be accessible and visible from all areas of the classroom.

The design must also include proper ventilation to ensure air quality when working with materials like paints, solvents, and clay. Ventilation systems, including exhaust fans and open windows, are essential for removing harmful fumes, and temperature control systems help maintain a comfortable environment for students working with sensitive materials.

Safety is a key consideration in art classrooms, especially with materials like glass, clay, and chemicals. Design features should include easy access to first aid, fire extinguishers, and emergency exits. Safety equipment such as gloves, goggles, and aprons should be readily available, and clear safety instructions should be displayed.

The ideal visual arts classroom should be flexible, well-organized, and technologically advanced, with specialized storage, appropriate lighting, and ventilation to support the diverse needs of students and enhance their learning experience.

World Language. World languages are taught through three distinct communicative modes: interpersonal, interpretive, and presentational. Furthermore, cultural connections serve as the anchor through which these modes of communication are rehearsed and applied. To that end, a successful world language environment is a dynamic, active classroom that affords students many opportunities to engage in the aforementioned modes of communication, similar to what one would expect in an ELA or social studies classroom. The Guiding Principles for Language Learning produced by the American Council on the Teaching of Foreign Languages, more commonly known as ACTFL, specifically underscore the following key elements involved in impactful language instruction:

- Literacy in language learning - includes interaction with the target language through reading, writing, listening, and speaking
- Target language use - includes what language learners learners say, read, hear, write, and view

- Authentic text - includes interactive reading and listening comprehension tasks in the target language
- Communicative tasks - includes oral interpersonal communication between learners
- Effective feedback - includes feedback to learners for the purpose of advancing language proficiency

To accomplish the aforementioned principles, ample space must be available in world language classrooms to allow for flexibility in furniture arrangements that fluctuate between whole group, small group, partner, and individual throughout a single class period. Moreover, when furniture is arranged in different groupings, students and the teacher need to be able to easily move throughout the classroom. This is particularly critical to accomplish the principle of "effective feedback". Teachers cannot provide real-time feedback to students as they "play" with the target language if they cannot listen in on interpersonal conversations, for example. Flexibility of the learning space also includes mobility of the teacher's workspace so that this does not become a physical barrier to grouping options. Furthermore, the ideal world language classroom also has visual support, similar to the idea of word walls in ELA classrooms, to foster real-time target language communication support. Additionally, strong world language classrooms host classroom libraries with a variety of texts that foster student learning and interests. World language classrooms should possess ample wall space for student brainstorming and iterative language development in the form of whiteboards and/or space to post large poster paper. Also, a strong world language classroom displays cultural regalia so that students can make meaningful connections to the cultural underpinnings of those that leverage said languages as their first language.

During the 2023-2024 school year, WSD conducted a curriculum audit of the world languages offered. The audit highlighted the following instructional strategies as a part of the Best Practices in Teaching World Languages:

- Daily lessons are learner-centered giving students multiple opportunities to practice the target language in pairs and small groups.
- Movement is incorporated in daily lessons through activities where students change partners, complete tasks in small groups.
- The teacher incorporates brain breaks throughout the lesson to maintain alertness among students.
- Students can self-assess their ability to understand and use the target language.
- Culture via the use of authentic materials is integrated throughout a lesson.
- Students receive actionable feedback on their performance.
- The teacher integrates the three modes of communication within a lesson.

In addition to space and strategies, acoustics are also important in world language classrooms. Since nuanced communication is critical in supporting developing language learners, acoustic levels need to be mitigated so that students and teachers can accurately respond to verbal outputs. Similarly, comprehension of authentic language outputs in the forms of video or strictly audio mediums, such as podcasts or radio segments, are often compromised for learners when there are acoustical interferences in the classroom.

In the previously mentioned world language curriculum audit, the auditor provided findings based upon observations of classroom instruction. The auditor made note that some classes were very teacher-centered with few to no opportunities for students to work in small groups or pairs. In other classrooms observed, opportunities did not exist for students to move out of their desks to engage in interactive language rehearsal activities. Conversely, in some classes students had frequent opportunities to practice the target language in pairs, small groups, or through stations. Finally, the prevalence of purposefully integrated culture was inconsistent across classrooms.

Given all of this information, it is worth considering to what degree the physical environment and its (1) spatial layout, (2) furniture, fixtures, and equipment, and (3) physical attributes are contributing to the wide spectrum of learning experiences.

Specialized Spaces within the Building. As discussed, there are a number of large-group spaces within the school building that serve multiple purposes. For example, the gym serves as a PE classroom during the day and after school may transition to a practice and/or competition facility for any number of different athletic and activities groups. These can be school sponsored or, in most cases–which is true for the Wauwatosa School District– these spaces can also be rented out if the district does not need them during the requested period of time. Thus, these types of school spaces must be flexible not just in how they can support student events, at the size and scale of the students who attend the school, but also be ergonomically correct seating for all ages and meet all accessibility needs too. In considering these types of spaces and reading up on the literature to inform rubric creation for the *Analysis of Learning Spaces,* the decision was made to defer to the section on Overall Building Aesthetics and Quality as many of these same types of facilities were discussed in that context.

It is worth noting that smaller cross–over spaces that are generally not also public facing with the exception of parents coming in to meet with staff about and/or with their children, such as the Administrative and Guidance Offices, Special Education and Pupil Service team member offices were considered to be mini-classroom

spaces for the purposes of rubric creation. This was determined because these cross-over spaces can include 1:1 and small group meetings where teaching and learning is occurring in the same manner as it would in a full-sized classroom. Therefore the research-based classroom features such as acoustics, lighting, thermal comfort, etc all apply and were considered as the basis for rubric development. Any specific functions in addition were noted on the rubric as a descriptor of something unique that would ensure the service could be fully carried out.

Conclusion

The literature highlights that decisions around building design must not be made in a vacuum, divorced from a critical lens on the vision and goals for teaching and learning in a school district. The design functionality of a learning space will inevitably have a positive or negative impact on students' and staffs' experience and ultimately learning outcomes coupled with other important factors of the school (and work) experience. Similarly, decisions made around maintenance of a building, or lack thereof, will also inevitably will have either a positive or negative impact on the student and staff experience and outcomes. While the literature highlights that school building maintenance is the first to see setbacks when budgets are tight, it is imperative to know and consider the implications to teaching and learning should there be a necessity of reductions that will result in deferred maintenance, outdated systems which are more likely to be inefficient and cause health concerns, and allow the building and grounds to show signs of disrepair.

In addition, research provides a firm foundation in both general and program-specific features which increase the likelihood of student success and improved learning outcomes. Examples of this include things like classroom size which moderates the amount of flexibility in instructional techniques due to circulation space along with furniture provided, which directly impacts pedagogical agility and in turn, student engagement. School staff are also impacted by a lack of the amount and type of work spaces needed to do their jobs, and do them well.

Finally, by reviewing and including WSD's Instructional Philosophy, research-based best practices for each programmatic area, and recommendations from recent curriculum audits, a fully developed picture of what all school buildings need to best support inhabitants down to exactly what each program-specific learning space in the Wauwatosa School District needs to include can be formed. This, coupled with gaining feedback from educators who are subject matter experts in their content areas, led to the creation of the rubrics used to analyze the learning spaces.

Methodology

The desire to go beyond traditional Educational Space Adequacy (ESA) analysis for the purposes of Long-Range Facilities Planning, coupled with the complexities of changing student enrollment counts and programmatic and service offerings to best serve students, led to the concept of what has become this *Analysis of Learning Spaces*. While there are industry-referenced rating scales for classrooms that house specific programs (such as Art, Music, Auto Maintenance, Culinary Arts) they can be difficult to reliably use in different school districts due to varying classes offered within these broad fields, regional labor market needs in sub-areas within these programmatic areas which often influence the breadth and depth of programming, and local funding available.

Similarly, increasing research has become available which illustrates differential student achievement outcomes and attitudes about school attendance with varying features of building and grounds. While impossible to create causal links, contemporary research is encouraging in isolating variables such as the amount and frequency of exposure to natural daylight, defining and measuring safe and welcoming school environments, and content and program specific design features which maximize implementation of curricula.

The Wauwatosa School District has a well-articulated Strategic Plan (approved in 2022) as well as recently completed comprehensive curriculum and programmatic review recommendations indicating resources (including features of the building and grounds) needed to fully realize programmatic goals. While aforementioned research is available on varying features of school buildings and grounds, no inventory or survey template could be found that takes into account features of buildings and grounds that support full implementation of programming at the secondary school level. Given that the WSD Model Elementary School had been developed and voted on already by District residents in the 2018 referendum, the four secondary schools, which remained largely untouched for improvements to learning spaces during 2018 projects or in other projects since, are the focus of this analysis.

Thus, a five-step process to analyze the secondary school learning spaces within the WSD was determined and implemented over a timespan of December 2023 through March 2025 as detailed below (Appendix F).

Process Determination

With the Tosa 2075 Task Force meeting and asking thoughtful questions about various District buildings and their ability to meet programming and service needs, District leaders from the WSD and PRA met on December 28, 2023 to discuss the concept of creating a new means of Analyzing Learning Spaces that would incorporate not just space calculations based on enrollment and building square footage, but specific and research based information for each programmatic area. In addition to rooting the analysis in the District's plan and programming as desired, the decision was made to evaluate every room within each of the secondary building spaces.

This level of detail was deemed necessary because often a section of a school is dedicated to a programmatic area, such as the science wing or the math floor. If programmatic spaces were rated together, areas meeting expectations and needs that could serve as a template for deficient areas might be less noticeable if space ratings were taken on the whole, creating an average. Also, this method of averaging space ratings without also having room/location-specific data could lead to duplicate space review later and/or inaccurate cost estimates if projects were undertaken to improve spaces that were not meeting functional expectations. This room-specific data is also useful in creating a master building schedule in the assignment of class offerings to spaces to ensure that the most highly rated rooms are utilized the most during each school day and less favorably rated rooms the least. Finally, having a specific rating for each space makes it easier to showcase both ideal–and less than ideal–spaces for community members who may need to tour the buildings to understand their potential investment for donations, referendums or other kinds of support.

A second meeting was held on January 19, 2024 to set the official vision of the *Analysis of Learning Spaces* with additional members of the Division of Academic Performance team. During this meeting the desire to create customized rubrics, rooted in the District's Strategic Plan and recently identified programmatic and service audits, was affirmed in addition to the determination that each space should be separately rated and catalogued for future use as distinct from other learning and building spaces.

Two additional meetings to continue to discuss and envision the scope of the project, timeline and involvement of key Wauwatosa District Staff along with PRA team members were held on January 24 and 30. These meetings allowed for a final draft of the Process + Timeline (Appendix F) to be created and prepared for review on

February 20, 2024 as a precursor to the kick off to the formal Pre-Analysis Planning Phase.

Pre-Analysis Planning Meetings

In anticipation of the creation of fifteen customized rubrics, a five question survey (sent via Google Form by WSD) was drafted and sent to all secondary school staff on February 26, 2024 and remained open until March 6, 2024. The questions included:

- Content Area and Course
- Room Number
- What are current strengths about your learning environment related to the functionality of the space in providing the desired level of instruction? (ie: space for collaboration, room for ample movement, etc.)
- What are current challenges about your learning environment related to the functionality of the space in providing the desired level of instruction? (ie: acoustics, room for ample movement, etc.)
- From your perspective, what does a desirable learning space for your content area/course include that would allow you to deliver the optimal instructional experience for scholars? (ie: white boards, room for scholars to spread out into small groups, storage, etc.)

The intent of asking staff for feedback about the spaces in which they work daily in advance of rubric creation was to begin to learn from those most familiar with the spaces. As a result, the nuances of each room were elevated and the opportunity to begin to collate data as a pilot about the spaces being studied emerged. Furthermore, this feedback presented insight into commonalities and concerns that could assist in framing sections of the rubrics to ensure that no feature or aspect of the spaces was unaccounted for in the rubric creation and finalization process. Responses to this survey are available in Appendices G-J.

Beginning on March 8, 2024, the *Analysis of Learning Spaces* research team grew with the addition of five content and program specialists within the Division of Academic Performance to form the Facility Study Team (FST). Appendix K identifies the members of the FST. During this initial day-long meeting, the newly formed FST met to become oriented to the envisioned *Analysis of Learning Spaces* process as designed to date, set the FST's purpose within that process, set dates to tour each of the four secondary schools in WSD's portfolio, and anchor in Sanoff et al.'s, (2001) work of Six Factor School Building Checklist: A Walking Tour.

Assessment Development

Sanoff et al.'s (2001) aforementioned building checklist served as the inspiration behind the development of the rubrics used to assess the learning spaces within the four secondary schools in Wauwatosa. With the background research regarding overall needs for modern learning spaces as well as program-specific needs, themes were identified to begin determining the framework for the rubrics. Broadly, the three identified for classrooms and learning spaces were:

- Spatial Layout of Learning Space including personal space, shared space, circulation access, access to storage, access to adjacent small group collaboration spaces, access to adjacent large group collaboration spaces, adequate space for delivery of effective instructional practices, and technological adaptability.
- Furniture within Learning Space including moveable furniture, flexibility in furniture, wall-boards for displaying instructional materials/resources, instructional preparation area, space for instructional equipment, and fixtures/equipment.
- Physical Attributes of Learning Space including acoustics, adequate light/dark control, adequate power, fixed features (walls/windows), natural daylight, site lines, thermal comfort, and overall aesthetics.

The assessment tool designed by Sanoff et al. (2001) serves as a checklist for users of the tool to assess a space's degree of satisfaction ranging from very unsatisfactory to very satisfactory. The FST was uncomfortable with replicating the checklist method due to the lack of specificity around what the degrees of satisfaction meant. Further following the guidance of Sanoff et al. (2001) the assessment tool should be designed to be used by a variety of stakeholders including but not limited to students, teachers, parents, architects, school board members, and a citizen's advisory council. Therefore, it was the desire of the FST that there be clear descriptors for the degrees of satisfaction so that any of the aforementioned users of the tool were all working with the same definition of "sufficient" when evaluating a space. Therefore, great time, care, and attention was given to producing the rubrics that would be used to assess the learning spaces within the secondary schools in the Wauwatosa School District. The literature presented alongside the District's articulated instructional philosophy shaped the descriptors of the rubric.

Additionally, thought was also given to how to rate the buildings overall, with identified dimensions being:

- Safe and Welcoming Environment: Parking, Clearly Marked & Secure Main Entry, Reception Area, and Storage

- Personal Comfort Factors: Restroom Access, Water Bottle Fillers, Food Service and Students, Staff, Visitor/Events
- Serves Student, Staff and Community Needs: Guidance & Student Support Services, Students with Disabilities, Library/Media Services, Community-Building Spaces, Activities, and Athletics

With these areas identified, full rubric creation commenced offline with Dr. Nicole Marble, WSD Chief Academic Officer and Dr. Melissa Thompson, PRA Director of Educational Strategy beginning to frame out each program-specific rubric leveraging direction from the District's Strategic Plan, recent programmatic audits, and research provided in the literature review. The FST met on April 9, 2024 to review progress made and critique each rubric. More content, program, and service specific language was added to each rubric based on FST member expertise and the present level of District performance and need in each area.

Rubrics were then formatted and downloaded so the FST could pilot the rubrics on April 15, 2024 at Wauwatosa East High School. Doing so led FST members to revise phrasing of some descriptors and affirmed the approach of having a 4 point scale:

1. Missing
2. Partially or Minimally Present (with comments requested if this rating was used)
3. Sufficient
4. Exemplary

Drafts of the rubric were shared with WSD Content Team Leaders (CTLs) and WSD Subject Matter Experts (SMEs) on April 29, 2024. These stakeholders were asked to provide feedback on additional descriptions needed or deletions to the descriptors by May 17, 2024.

Rubrics were then uniformly updated with reworded descriptors, formatted, and provided back to the FST for a final review to ensure all program specific nuances for each rubric had been included. A Google Form was then created for each rubric to be more easily used by raters as they walked through each learning space and building, with a QR Code generated and put on a menu page for fast transitions between spaces to be rated. This final step in readying the rubrics was completed between May 13-17, 2024, after feedback was provided by CTLs and SMEs. All rubrics can be found in Appendices L-Z.

During the data analysis process, the above ratings of missing, partially or minimally present, sufficient, and exemplary took on a numerical rating with a 1 representing missing, 2 representing partially or minimally present, 3 representing sufficient, and 4 representing exemplary.

Analysis of Learning Spaces

The next phase of the *Analysis of Learning Spaces* process included utilization of the rubrics to rate each of the WSD four secondary school buildings overall as well as the learning spaces within. These visits were set up internally by the WSD staff for the FST rating days. "To assess a school's quality it is necessary to observe it in action" (Sanoff et al., 2001, p. 15). Adhering to this guidance, the FST rating days were strategically scheduled to observe the spaces in action with teachers and students going about their typical teaching and learning actions. On the days of the visits, office staff greeted members of the FST and provided building master keys for the day to ease entry into each learning spaces within the building. Wauwatosa West and East High School ratings occurred on May 21, 2024 and May 23, 2024, respectively while Whitman and Longfellow Middle School ratings occurred on September 30, 2024 and October 3, 2024, respectively.

All secondary staff members were invited to utilize the rubrics as well so that additional data points and perspectives from those most familiar with the spaces could be obtained. This rating process occurred from May 29 - June 5, 2024. Within this report, comments submitted by school-based staff have been added to provide a qualitative context to quantitative ratings. School-based staff (teachers, support staff, school-level administrators) will be referred to as school-based assessors or school-based evaluators within the report. It should be further noted that any direct quotes included in the report have *not* been modified for grammar, spelling, or voice so as to not compromise the writer's authenticity.

Data collation and review, along with the drafting of the initial *Analysis of Learning Spaces* report began in November 2024. A check in with Superintendent Dr. Demond Means as well as PRA Partner and Education Studio Lead Nick Kent occurred on December 16, 2024 to discuss preliminary findings and to ensure the report format would be useful for future conversations and decision-making within the Wauwatosa community.

Conclusion

The analysis of the learning spaces at the secondary schools in the Wauwatosa School District is a novel approach to facilities management. It was important to District leadership to have a comprehensive understanding of the functionality of teaching and learning in these spaces benchmarked to expected industry standards. Furthermore, it was important to District leadership to have the educators charged

with working, in service of students, in these spaces to provide input based on their lived experiences. What follows are the findings from the study.

Findings

Introduction

As previously stated, **the purpose of this study is to provide a comprehensive analysis of the learning spaces. This report focuses specifically on the instructional functionality of the secondary classroom spaces in the Wauwatosa School District. Additionally, the study provides analysis of the common spaces within the building overall.**

Yet, readers of this report are cautioned as they read the findings. As noted by Sanoff et al. (2001), "*the assessment tools are not intended to be used as a strict evaluation instrument, with its findings to be used against schools* [emphasis added]" (p. 15). Rather, these findings, through the use of the leveraged tools are, *"intended to serve as a basis for an informed dialogue and consensus building with those involved in shaping K-12 school environments* [emphasis added]" (Sanoff et al., 2001, p. 15). Therefore, **these findings, alongside the literature review of this report, are presented to spark community conversation** on next steps in addressing the myriad of needs within the secondary schools of WSD. What follows is a comprehensive report of the findings of the study.

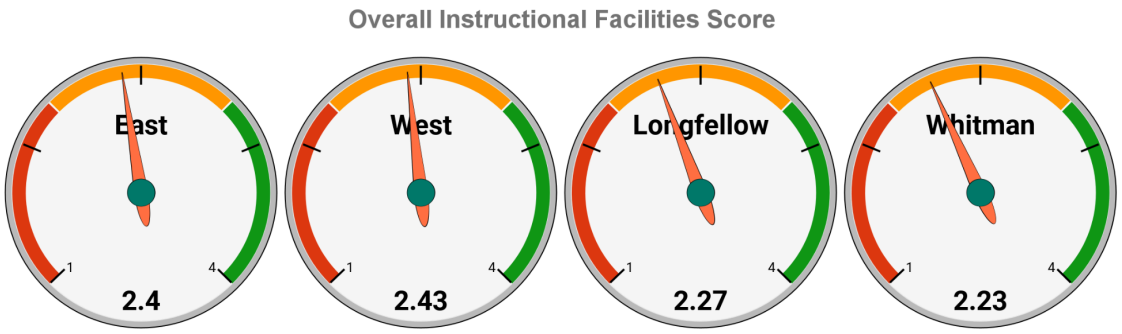
Overall Instructional Facilities Findings

Currently, the four secondary schools in the Wauwatosa School District are in need of at least approximately $150 million dollars in deferred maintenance. This is local evidence that Wauwatosa has been victim to what researchers have pointed out in regards to there being lack of funding nationally to support capital improvements in public schools (Alexander & Lewis, 2014; Filardo et al., 2019; Leachman 2018; Schneider, 2002). Moveover, simply attending to the deferred maintenance leaves many identified issues unresolved. The findings of the *Analysis of Learning Spaces* report uplift the challenges that exist in our current four secondary schools as well as underscore the positive elements that do exist and should be maintained.

After tabulating the responses submitted from the facilities study team as well as school level educators, West was identified holistically as being the most supportive instructional facility of the four secondary schools and Whitman being the least, though the variation in scores is within 0.2 on a score of 1-4. What follows is an analysis by building, by content area.

Within each school, an analysis is provided for both core content areas (English, math, science, and social studies) as well as elective areas such as art, music,

technology education and world language to name a few. Elective offerings are highly coveted by not only the students and families within WSD, but also the larger Wauwatosa Community. This is evident by the $16.1 million dollar operational referendum that the community passed in 2024 which allowed the District to continue to offer these highly regarded elective offerings for students. As such, the spaces that support these courses have been included as a part of this study.



The percentage of content areas that met or exceeded an overall "sufficient" rating was 0%, naturally leaving **100% of instructional spaces falling below the identified "sufficient" status at the four secondary schools**.

Wauwatosa East High School

Wauwatosa East High School, located at 7500 Milwaukee Avenue, was originally constructed in 1927 and served as the original Wauwatosa High School. The site is bounded by Wauwatosa Avenue on the west, a residential area on Hillcrest Drive to the north, 74th Street on the east and Milwaukee Avenue on the south. The school, along with the playfields to the north, occupy the majority of a two block area (11.4 acres).

The building has been expanded and renovated several times. The first three expansions in 1930, 1938, and 1939 were all part of the original facility plan. Further expansion was conducted in 1958, 1972, and 1975.

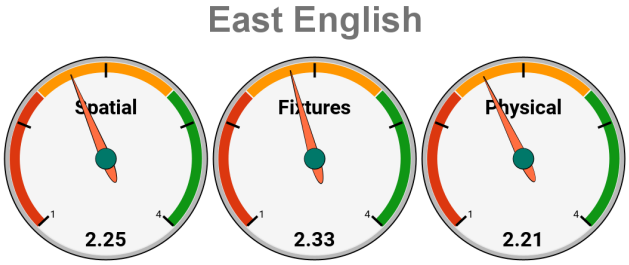
In recent years, a secure front entry vestibule was created at the main entry on Milwaukee Avenue (2015) and in 2021 the existing pool was removed and a new, larger aquatic center built in its place. With the opening of Wauwatosa West High in 1967, and the additions of the 1970s, the full capacity of the building was no longer needed. As a result, the third floor of the building was mothballed and is presently used for mechanicals and storage. Today it is 328,000 square feet serving grades 9 - 12, with significant extra room if the third floor was brought back online. In regards

to the functional school capacities calculation, Wauwatosa East High School passes all three methods: (1) capacity by desired class size, (2) capacity by learning environment area, and (3) capacity by gross building area (Wauwatosa School District Long-Range Facilities Plan, May 2024, p. 108).

Core Content Areas

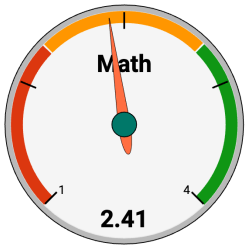
English. The spaces utilized for instruction in the area of English Language Arts were assessed at a 2.26 average rating. When broken down by (1) spatial layout, (2) furniture, fixtures, and equipment, and (3) physical attributes, the English spaces rated highest in the area of furniture, fixtures, and equipment. Movable furniture was identified as the greatest strength of this category while educators' instructional preparation area was identified as the item in greatest need of improvement (average score of 1.81).

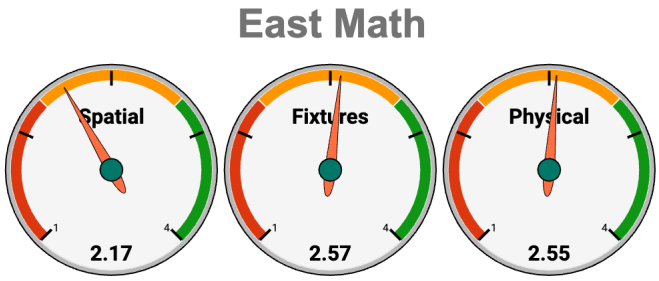
As it pertains to spatial layout, technology adaptability in the spaces that currently support English instruction was identified as the greatest strength (average score of 2.65) while access to adjacent small group (average score of 1.38) and large group (average score of 2.13) collaboration spaces were identified as the greatest area for improvement. Of additional note, circulation access also scored relatively low (average score of 2.15) in comparison to other metrics in this category. Comments associated with the scores around circulation access state that the spaces supporting English instruction are relatively small leaving it difficult for students to move around the space free of physical barriers. It is further noted that many of the spaces would not allow someone in a wheelchair to move freely about the classroom. As highlighted in the literature review, classroom circulation is critical for teachers to be responsive to student learning needs. The inability for teachers to do this compromises a key part of the learning cycle - real-time, in the moment feedback to students to feed their learning forward and immediate opportunity to address any emerging misconceptions.



Finally, physical attributes were identified as the collective weakest category of the English spaces. Natural daylight was identified as the most lacking (average score of 1.63). One school-based assessor shared, “I have heard students say, "I only have one class with a window’”. Thermal comfort (average score of 2) and adequate power (average score of 2.03) were also rated poorly. Comments related to thermal comfort note that teachers do not have access to control the temperature in classrooms. Additionally, comments report that often the spaces are too warm or too cold depending upon the time of year. Regarding adequate power, multiple school-based evaluators note the use of extension cords in the classroom so that students can access power to charge their Chromebooks, especially during classes at the end of the school day. Further commentary on the use of extension cords to provide students access to power noted that, “students are constantly tripping over” them. A suggestion from a school-based evaluator was, “floor outlets (or outlet stations) would be a good start to making the space power friendly”. Serving as the greatest asset in the English learning spaces was site lines (average score of 2.55).

Mathematics. Overall, the mathematics instructional spaces at Wauwatosa East High School averaged a 2.41 score. When broken down by (1) spatial layout, (2) furniture, fixtures, and equipment, and (3) physical attributes, the spaces rated highest in the area of furniture, fixtures, and equipment. This does not come as a surprise to WSD staff as new furniture, fixtures, and equipment were purchased alongside new math curriculum implementation in the 2016-2017 school year. This included more flexible furniture that promotes student to student collaboration as well as additional whiteboards mounted on walls to promote visualization of student thinking. Until the most recent English Language Arts and Science curriculums were implemented in the 2024-2025 school year, math was the newest curriculum adoption. Despite the large number of mounted whiteboards that are accessible in the math classrooms, there are overwhelming comments from both school-based assessors and the FST noting sub-par functionality of these boards as they are glass. The glare from both natural and artificial light impedes visibility of what is written on the boards. It was also shared that only some marker colors are visible at a distance and extra strong magnets are needed to post materials on the boards.

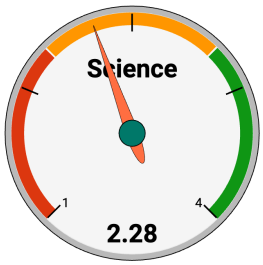




Rating the lowest for the mathematics spaces at East High School was the spatial layout. Albeit that assessors identified personal space as the category's greatest strength with a rating of 2.58, assessors noted that access to adjacent small (average score of 1.31) and large group collaboration spaces (average score of 1.58) as lacking.

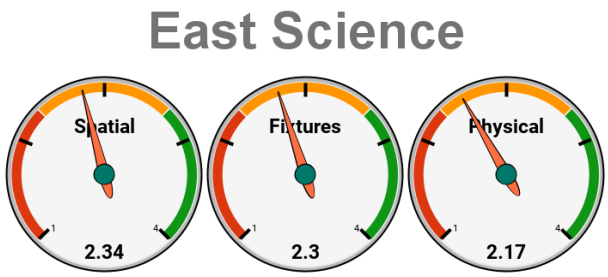
Strengths contributing to the average 2.55 score under physical attributes include adequate light/dark control (average score of 3.38) and natural daylight (average score of 2.85) with the greatest area for improvement being access to power.

Science. The science classrooms at Wauwatosa East emerged as the highest rated science classrooms of the four secondary schools with an overall rating of 2.28 out of 4. This is closely followed by the overall average score of the science classrooms at Wauwatosa West (average score of 2.27. Science labs are mostly appropriately-sized, but are dated and in need of renovation. The aggregate rating for the science spaces at Wauwatosa East High School was assessed at a 2.28 average rating. When these spaces are analyzed from the aforementioned three sub-categories, spatial layout rated the highest. Storage access (average score of 2.64), technology adaptability (average score of 2.68) and personal space (average score of 2.73) were identified to be the strengths of this category leading to the categorical average rating of 2.34. Receiving the lowest rating in this sub-category was that of access to small group collaboration spaces (average score of 1.47). The second lowest score was associated with circulation access (average score of 2.31). Comments submitted alongside circulation access ratings indicated that many of the spaces are challenging to navigate; nearly impossible for students and staff with restricted mobility (e.g. individuals in wheelchairs). One school-based assessor shared, "Student backpacks are generally in the way for other students to be up and about. This is not a problem for me as I have had to step over back packs for the last 22 years in this room and can get between the aisles. Anyone larger or less agile than me would probably have a problem navigating the room". Despite this educator's willingness to adjust to their environment, these working conditions are less than optimal. Furthermore, teachers are expected to monitor student thinking and work so that timely feedback can be provided. If a teacher has to climb over backpacks and navigate clunky furniture in tight spaces, one's ability to fluidly monitor student learning is compromised, thus a key part of the learning cycle is impacted which is a detriment to maximizing student learning.



Largely contributing to the low average score of 2.17 for physical attributes is the 1.02 average rating for natural daylight. No classroom at East High School that is utilized for science instruction has access to windows. Adequate power (average score of 2.1)

and thermal comfort (average score of 2.19) were also scored low. The greatest noted strength of the classrooms at East is the acoustics (average score of 2.58).



One of the key instructional practices in any science classroom is fostering an environment for safe investigation and experimentation of the scientific world. This is largely done by way of lab experiments in science classes. To ensure proper safety features a supportive classroom will have the following items present and easily accessible: chemical fume hoods for chemistry classrooms; eye wash stations in each science classroom; sinks in all classrooms; gas lines in each room; individual lab stations (where students can collaborate in a lab as a group, facing each other; not facing outward toward the wall only); chemical storage cabinets; fire blankets & extinguishers; first aid kits. When assessed against these standards (Fixtures/Equipment), the science classrooms at East High School scored an average of 2.12 meaning that many of the aforementioned requisite features are largely missing or minimally present. Comments related to this note dysfunction of safety showers and lack of fume hoods in classrooms that one would expect to see a fume hood (e.g. a chemistry classroom).

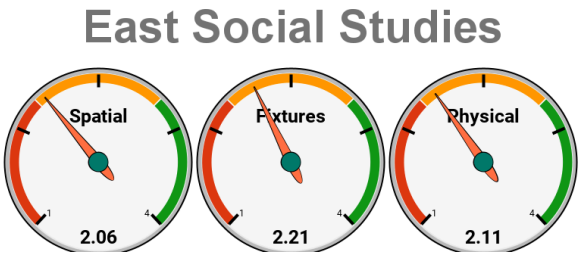
Coupled with the Fixtures/Equipment rating is the Fixed Features rating under physical attributes. Assessors evaluated the science spaces at East High School to have an average score of 2.25. This score as well as the low 2.12 score for Fixture/Equipment highlight that science classrooms at East inherently do not promote safe, student-centered learning, especially when it comes to safe parameters for experimentation. Furthermore, not all classrooms house the aforementioned requisite equipment, thus limiting valuable experimental experiences for students.

Social Studies. Overall, the instructional spaces utilized for Social Studies instruction at Wauwatosa East High School averaged a 2.12 score. **This is the lowest rated content area at East High School.**

Spatial layout was rated the lowest with access to small group (average score of 1.14) and large group (average score of 1.7) collaboration spaces being rated the lowest.

This was followed by shared space (average score of 2.14) and personal space (average score 2.19). The average square footage of the classrooms that currently support social studies instruction at East High School is 833 square feet. There are multiple sections of required social studies courses with 30 students in the class. When calculating capacity by learning area, 35 square feet per student is used. Given these calculations, the maximum number of students on average that should be in a single social studies class is 23. Knowing that this is not the typical average class size, it can only be concluded that the social studies classrooms are overcrowded. Comments shared by assessors, which included teachers that work in these spaces daily, noted that the classroom spaces are tight and do not allow for easy circulation of staff or students. This presents a significant challenge instructionally. Teachers are expected to monitor student thinking and work so that timely feedback can be provided to feed student learning forward. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.

While fixtures were rated the highest, instructional preparation area for teachers (average score of 1.92) and space for instructional equipment (average score of 2.05) were identified as the greatest areas for improvement, while flexible furniture (average score of 2.62) was identified as the strength of these classrooms.



In regards to the scoring behind physical attributes, site lines (average score of 2.43) and overall aesthetics (average score of 2.41) were identified as the strengths within that category. Thermal comfort received one of the lowest scores with an average score of 1.92. Comments associated with the thermal comfort scoring noted that the rooms that currently support social studies instruction have extreme temperatures. The rooms are either unbearably cold or hot and humid. The rooms are above the current pool which may contribute to the humidity. Comments associated with these extreme temperatures also noted the difficulty that staff and students have staying focused on teaching and learning when the space is too warm or too cold. Natural daylight (average score of 1.27) was assessed as the lowest score. It should be

noted that only one classroom that currently supports social studies instruction has windows.

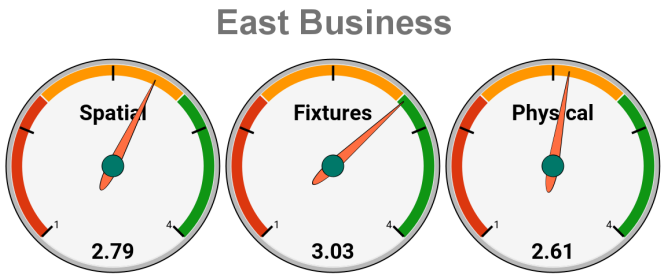
Elective Offerings

Business. The spaces that currently support business education were assessed to be the overall strongest instructional spaces at East High School with an average overall score of 2.78.

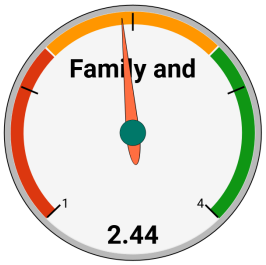
Most of the assessed elements earned a score of 3, meaning that what is currently in the spaces sufficiently meet instructional expectations with the exception of two negative outliers and two positive outliers.

Related to spatial layout, access to storage was identified as a positive outlier with an average score of 3.14. The negative outlier came with access to small group collaboration space with an average score of 1.57.

Under fixtures, wall-board space was a positive outlier with an average score of 3.14. Under physical attributes, the negative outlier was access to natural daylight (average score of 1) as none of the spaces that currently support business education have windows.

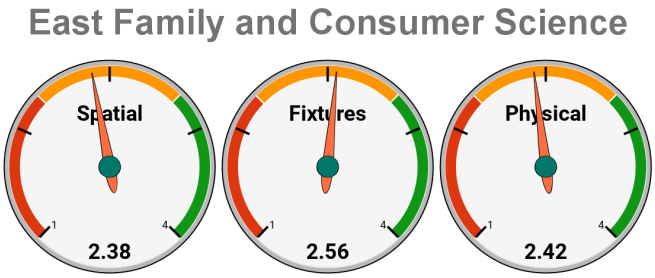


Family and Consumer Science. The classroom that supports the Certified Nursing Assistant (CNA) program was updated in 2019. This space was certified as an approved certification location in fall 2024. This program is limited to 10 students per certification requirements, therefore, the ratings communicated in this section are moot as it pertains to supporting the CNA course as it is declared "sufficient" to support the CNA program per certification requirements. Despite this "sufficient" rating, the space still lacks optimal elements such as access to natural daylight and thermal temperature control to name a few.



In 2016, the classroom that houses the kitchen labs was updated. In the 2024-2025 school year, the culinary arts lab space is used in 5 of 7 class periods each semester. While there appears to be an opportunity to increase the use of the space, the number of students that requested to take Culinary Arts 1 and were not permitted to enroll due to capacity limitations still exceeds the number of class periods in the day. For example, in order to fulfill the number of student requests for the 2024-2025 school year, 5 additional sections would need to be added. If the lab space usage were to be maximized, the maximum number of classes that can be run are 7 each semester for a total of 14 throughout the school year. Additionally, teachers that utilize the spaces daily noted that they are unable to add sewing to the curriculum (despite having sewing machines) due to the limited classroom space available.

Under spatial layout, circulation access is identified as the greatest challenge with an average score of 2.15. Comments associated with spatial layout speak to limited space to support the number of students taking the course at one time. Additionally, a school-based assessor shared the following, “backpacks and chairs make this difficult - moving around the room requires asking others to move or move their belongings”. Teachers are expected to monitor student learning so that timely feedback can be provided. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.

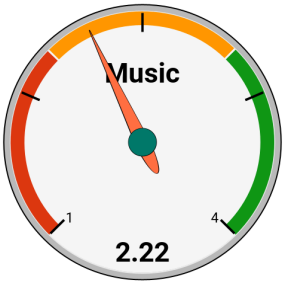


The fixtures of the Family and Consumer Science spaces were identified to be the greatest asset overall. Yet, fixtures/equipment (average score of 2.38) was identified as the greatest area of improvement. This is reflective of the kitchen labs being along the classroom perimeter which is problematic for safety supervision and providing real-time feedback to students.

In regards to physical attributes, access to natural daylight received the lowest average score of 1.31. This was followed by site lines (2.08) and thermal comfort (2.23). In regards to site lines, the classroom is recessed from the hallway making it a safety

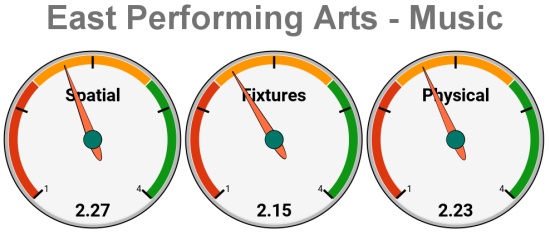
concern. In regards to thermal comfort, comments associated with this rating note that the spaces run on extremes - very warm, or very cold. Again, this extreme fluctuation in temperature can impede students' and staff's ability to properly concentrate on the teaching and learning task at hand.

Performing Arts - Music. Performing arts in the Wauwatosa School District is a pride point for the community. Wauwatosa East High School offers both performance based courses - choir, band, and orchestra, as well as non-performance based courses - music theory and digital music production where students create and produce their own digitally made music. The suite of music spaces was created with the 1970's renovation projects. In general, these spaces are dated and lack access to natural light. Accessibility is also a challenge.



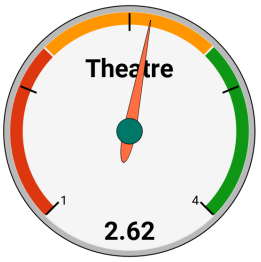
Overall, the instructional spaces currently supporting music instruction are small as evident by a 2.15 average rating for personal space. This is the **lowest score related to personal space at East High School**. Annually, it is not uncommon for one of the band ensembles to comprise more than 80 students or an orchestra ensemble to be composed of more than 60 musicians. This many musicians coupled with large instruments makes the environment challenging for all students and teachers to fit and rehearse comfortably, especially in the larger ensembles. Associated with personal space is circulation access which was assessed with an **average score of 2.08, making it the second lowest rating at East High School** only to be behind world language. In the comments related to circulation access, one music instructor noted that the room is too small for them to move in between students during class. This is problematic in the instructor's ability to provide both individualized feedback and address undesired behaviors in a personal and private manner.

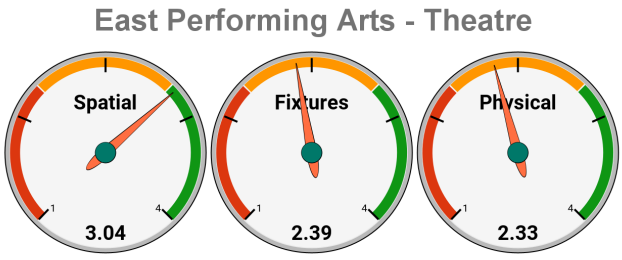
Access to storage under spatial layout was also identified as problematic. The average score for access to storage was a **2.31, which is the second lowest score at East High School** only behind world language. Expensive instruments are observed to be stored out in the open such as the hallway and in the back of classrooms. To add to this, the thermal temperature in the music rooms is also problematic. The average rating for thermal comfort was 2.31. As one teacher noted, "It is far too humid and warm...this temperature and humidity is damaging the instruments".



Performing Arts - Theatre. The theatre at East High School, which seats 1,250, underwent aesthetic renovations in 2016 as well as an update to the sound system. However, this system is not designed or equipped to manage the sound balance of such a large space. During this renovation, space utilization, systems, capital equipment, and support functions were not addressed. The lighting and controls have been updated three times since the 1990s, but due to the different systems installed over time, integration failures necessitate routine outside vendor service. Additionally, a significant portion of the space is still lit with incandescent lighting, which is behind the industry standards.

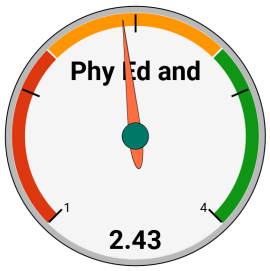
The theatre at East High School carries the **highest overall average rating (3.04) for spatial layout**. The theatre is used on a daily basis to support the theatrical courses offered. Therefore, in terms of supporting daily instruction, the limited wall-boards for displaying instructional materials such as anchor charts or other visual instructional supports is in need of improvement. This received an average score of 1.33. The site lines within the theatre are also problematic when considering the educator's responsibility to support a safe learning environment. The average score for site lines was 1.33. There are many entries and exits to both inside the school and the exterior of the building. There are also many nooks within the space making full visibility of who is in the space a given time challenging. Storage space is adequate but is located in a lower level that is prone to water infiltration and makes transportation of sets and equipment difficult and often results in damage to set equipment. Long-term consequences of repeated water infiltration damage over time is a concern. The venue lacks a direct, ADA accessible route to the stage. Scene construction shop space is adequate. Two dressing rooms measure approximately 64 sq. ft. each and are significantly undersized. The makeup area was upgraded in the renovation and does have more space.





Physical Education and Health. For purposes of the discussion around the spaces used for physical education and health instruction, the two will be discussed separately with the aggregate average ratings displayed in the graphics consistent with other content areas.

First, an analysis of the space utilized for health instruction. This space had an overall rating average of 2.43. The greatest identified strength of this space is the access to natural daylight with an average score of 4 making it exemplary. Of greatest concern in this space is the lack of adjacent small group collaboration space (average score of 1), technology adaptability (average score of 1.83), moveable furniture (1.83), and access to sufficient storage (2.17). Overall space is also identified as a concern in the comments despite the fact that the numerical averaging of the scores do not indicate this as a concern. Comments also indicate that due to the layout of the space, direct instruction, or teacher-centered instruction, is forced rather than the more desirable student-centered approach.

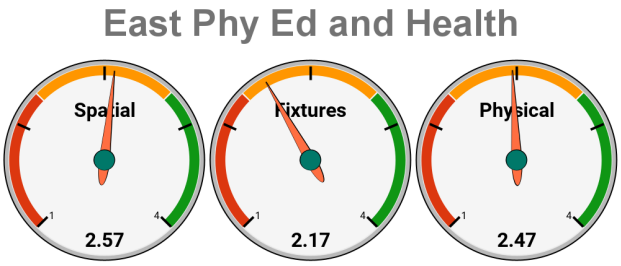


As it pertains to the space used to support physical education instruction, the spatial layout was largely deemed to be sufficient with an average score of 2.76. However, by industry standards, the gym space is significantly undersized for a high school of this size. It would not be uncommon for a school of this size to have a four station fieldhouse to accommodate demand for physical education classes as well as athletics. The greatest concern under spatial layout was technology adaptability (average score of 1.43). The gym spaces at East High School lack access to large scale digital displays and audio systems that allow students to see and hear demonstrations. This was followed by a low score associated with access to adjacent small group collaboration space (average score of 2). A space such as this would be supportive when the learning is centered on instruction not involving physical activity. The subsection of fixtures had an average overall rating of 2.12. This was mostly impacted by the lack of readily accessible furniture in the gym space and the limited wall board space to support visual cues. Overall, the physical attributes of the gym space received an average score of 2.3. Thermal comfort was identified as an area of concern (average score of 2.29). Temperature is unable to be adjusted by the teachers and the gym is not air conditioned which poses a safety hazard for participants under certain humidity and temperature conditions. Adequate light/dark control (average score of 2.14) was also identified as an area of concern. The lights run on motion detectors.

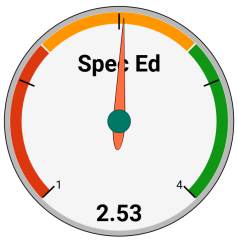
While it is not a state requirement, the physical education curriculum in the Wauwatosa School District is privileged to offer aquatics instruction at Wauwatosa East High School due to the presence of the swimming pool. As communicated in

the long-range facilities plan, the aquatic center was constructed in 2021, replacing an aged facility. As of the date of the facilities plan, a comprehensive engineering survey has been commissioned to identify and correct numerous construction defects and operational problems that have occurred since its opening.

Additionally, as noted in the long-range facilities plan, the locker rooms were renovated in 2021 and are in good condition. At that time, capacity expansion was not possible. Locker facilities for physical education needs are appropriately sized, but dedicated athletic lockers are not sufficient to meet demand.



Special Education - Resource. Special Education Resource rooms at Wauwatosa East High School are largely used for small group or individual instruction in service of a student's specially designed instruction outlined in their individualized education plans. Said another way, the spaces that support this element of special education services are not meant to support typical average class sizes of 25-30 students, rather less than 10 at a given time. That said, many are full sized classrooms or other, smaller classrooms. This use of space is aided by the current enrollment being lower than the building's target capacity. These spaces are also distributed throughout the building.

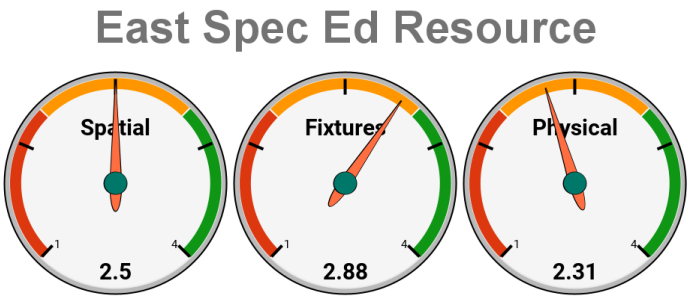


With this context, the following overall average ratings were identified: (1) spatial layout 2.5, (2) fixtures 2.88, and (3) physical attributes 2.31. Under spatial layout, access to large adjacent collaborative spaces was identified as sufficient (average score of 3) with access to small adjacent collaborative spaces receiving the lowest average score (1.25). Given the nature of these courses, the space itself could be considered the small adjacent collaborative space.

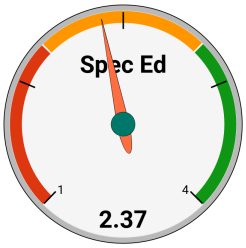
Under fixtures, all of the elements were identified to be sufficient (average score of 3) with the exception of wall-board space for displaying instructional materials which received an average score of 2.25. For a space that is intended to provide additional assistance to students in service of their individualized learning needs, ample space

to provide visual supports is paramount. Furthermore, one of the classrooms has large pillars running throughout the classroom making it difficult to monitor all students at the same time.

In regards to physical attributes, acoustics and light/dark control were identified as sufficient - both with an average score of 3. This is important knowing that these spaces may be utilized to support a student in re-regulating themselves. Having a space void of added noise pollution as well as sufficient ability to adjust lighting, is supportive of regulation strategies. The lowest score of these spaces was for access to natural daylight (average score of 1).



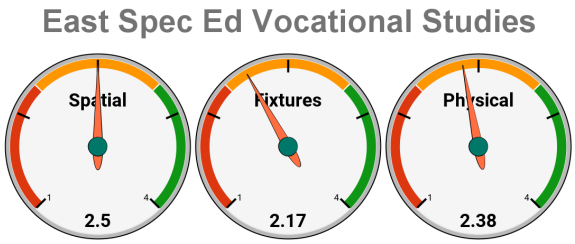
Special Education - Vocational Studies. The vocational studies program at Wauwatosa East High School supports students in their development of independent living skills such as cooking, cleaning, laundry care, as well as other executive functioning skills. The skills developed through this program can also be transferred to employability skills.



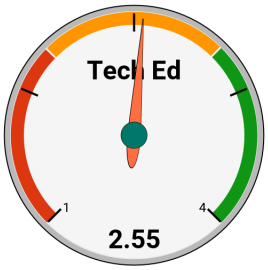
The elements that make up spatial layout were largely determined to be sufficient within this space, with the exception of the average scores of the following elements: circulation access (2.5), access to storage (2.5), access to adjacent small group collaboration (1), and technology adaptability (1.5). Since there is limited storage, materials and equipment are left out, thus contributing to the issue of circulation access. Furthermore, when supporting students with vulnerable needs, staff need unimpeded access to provide assistance and feedback to students during daily lessons.

Additionally, the fixtures in the vocational studies space are largely fixed which contributes to the overall average score of 2.17. There are moveable tables and chairs; however, there is limited space by which to rearrange said tables and chairs. Limited

wall space exists to provide visual cues for students in addition to limited space for physical models to also provide visual cues for students in their pursuit of engaging in the aforementioned skills independently.



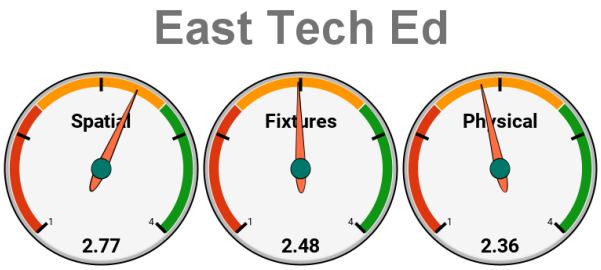
Technology Education. As part of the 2018 referendum, the technology education spaces were renovated. Since that time, participation in the program has increased, particularly in the area of construction trades. Overall, access to additional teaching space is needed to meet the increased demand.



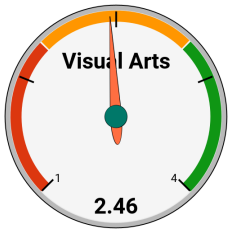
In general, there is strong support that the space allocated for instruction is sufficient as evidenced by the average scores associated with personal space (2.89), shared space (2.84), and circulation access (2.84).

Under fixtures, the instructional preparation area was identified as the greatest asset (average score of 2.74) while moveable furniture was identified as the area for greatest improvement (average score of 2.16).

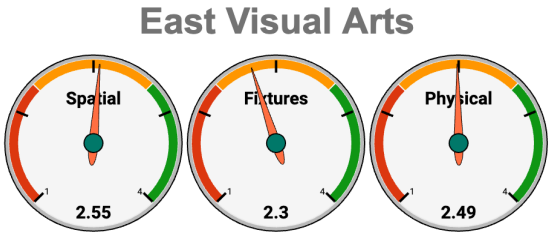
Under physical attributes, adequate power was identified as a strength (average score of 2.63), yet wide opportunity for improvement exists. The weakest element identified was site lines with an average score of 1.84. The greatest reason noted for this rating was the impediment to seeing into the hallways from within the classrooms, making this a significant safety concern.



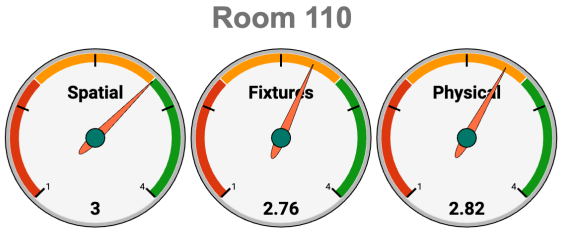
Visual Arts. Some of the spaces that support instruction around the visual arts at East High School were updated as a result of the 2018 referendum. The building has four primary art studios supporting 2D, 3D and Digital arts. The art studios are all located on the first floor of the building. In general, with the exception of 3D/Ceramics, the studios are generally appropriately-sized.



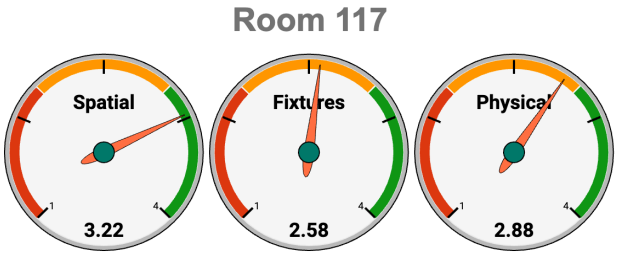
The instructional functionality of the art spaces vary from room to room largely due to the updates in some spaces, but not others. For that reason, each room will be discussed individually which is a deviation from how other content areas have been addressed. The overall averages for the three subcategories can be seen in the gauges below.



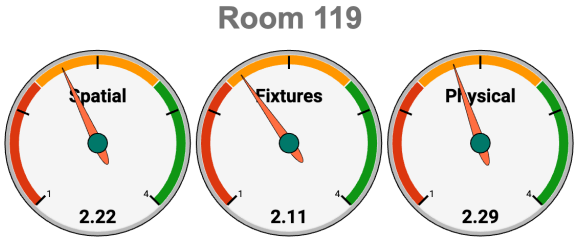
Room 110. Room 110 is the newest visual arts instructional space at East High school. It is a large open space that provides a lot of flexibility for instruction. The major criticisms of the space is that more storage is needed and the space is echoey thus impacting communication between the users of the space. The gauges below offer a high level assessment of the average ratings.



Room 117. This room was part of the 2018 referendum renovation. The educators that utilize this space noted that the renovations to this space were done incorrectly largely because of the communication breakdown due to school closures during the COVID-19 pandemic. Of particular note, the lab was placed on the incorrect side of the space and a large dividing wall that exists was not a part of the original conceptual idea. The wall that does currently exist was intended to be a sliding glass door. Furthermore, the space was intended to support digital art instruction. Due to the constructed layout of the space, the computer technology does not connect to the digital projector and cords plague the space causing tripping hazards. Additionally, part of the space serves as a museum board. The wall space that separates the lab and the museum space was supposed to be a museum board so that students could work on all walls of the workspace. While the space in general is aesthetically pleasing, the overall functionality is not being maximized to support the desired level of instruction. The gauges below offer a high level assessment of the average ratings.



Room 119. Room 119 mostly supports the introductory art class (Art Foundations) and painting. This room has not been updated. As such it is a very dated, not aesthetically inspiring space in comparison to rooms 110 and 117. The room is undersized with fixed features that serves as a barrier to a more flexible learning environment. Access to natural light is the greatest asset to this space while wall-board space for displaying instructional materials and resources is the area most lacking. The gauges below offer a high level assessment of the average ratings.



Room 123. Room 123 supports 3D art including ceramics. This room has not been updated and is the most concerning visual arts instructional space at East High School. A professional safety audit completed in 2023 identified numerous hazards and identified the space as unsuitable for the current programming and number of students. In particular, ventilation, general classroom size, and storage are inadequate.

As it pertains to the spatial layout, teachers that utilize the space shared the following comments:

- All items that enter the room become quickly covered in ceramic dust.
- Two large support columns obstruct seating and room arrangement options in addition to adequate supervision of students working.
- Potter's wheels are spaced very close to each other to accommodate larger class sizes.
- Sufficient cleaning is not achievable as there is very limited space to clean between student work spaces.
- To access electrical outlets, cords lie across the floor. These cords also often get splashed with water and slip as students work.
- Limited access to sinks.
- Moving about the room is challenging with the number of students in class (up to 30 students at one time).
- Teachers cannot get directly to all students to meet one-on-one to provide feedback to students as they work.
- Due to the poorly filtered air and the small work space, teachers who work in the space report experiencing breathing difficulties.
- Students are often seen working on the floor due to limited space.
- Soldering stations are closely situated next to clay stations.
- The storage that is present is limited to only small projects; larger projects are stored on open countertops which then impacts work space for other students.

In regards to furniture, fixtures, and equipment, educators had the following comments:

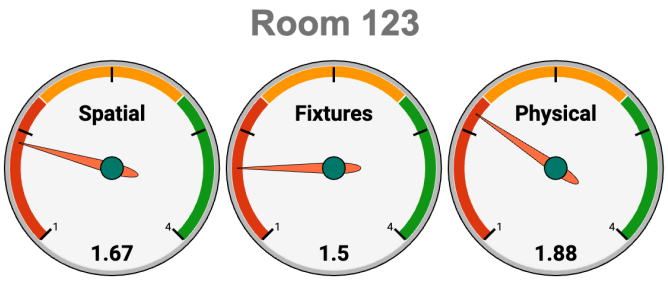
- Moving furniture is not an option due to the spatial layout.
- Tables are too low, old, and are not sturdy.
- More soldering stations are needed.
- There is no space to prepare materials out of the way of students' work space or space for large clay works.
- Students using potter's wheels are forced to sit very close to one another.
- There are no whiteboards for ideation.
- Fume hoods need to be more properly cleaned.
- Air filtration that removes dust particles is needed.

- Flooring that can withstand water is needed; currently flooring tiles continuously come up due to becoming wet.
- Sinks continuously clog.
- Insufficient space exists for the requisite number of soldering stations.

Finally, with respect to physical attributes, educators communicated the following:

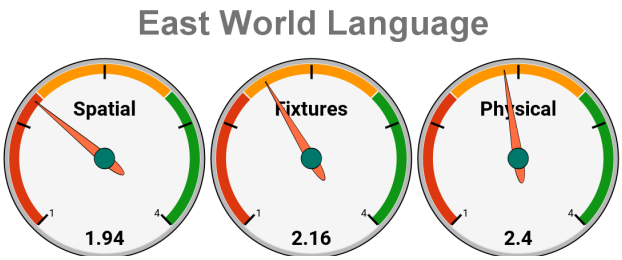
- Due to running equipment (pug mill, outdated ventilation hoods) it is often difficult for students and teachers to hear one another including hearing announcements and safety drills.
- Lighting is insufficient for students to solder.
- Larger wedging tables that allow students to stand at counter height are needed.

The gauges below offer a high level assessment of the average ratings of this classroom. The low ratings underscore how woefully problematic this classroom is in a quantifiable manner.



World Language. At Wauwatosa East High School, four languages are offered for students to elect into: Spanish, German, French, and Latin. Of the four, Spanish is accessed by the most students at East High School. The spaces that support world language instruction received an overall average score of 2.17 making it the **second lowest ranking content area just behind Social Studies**. When broken down by (1) spatial layout, (2) furniture, fixtures, and equipment, and (3) physical attributes, spatial layout received the lowest rating. In fact, the **spatial layout ranking for the World Language content area is the lowest ranking content area at East High School**. Comments from assessors, which includes staff that use the space daily, note that the rooms are very small. One world language teacher stated, "In a class of more than 18 students, there is not enough space in the classroom for students to spread out enough for assessments." The average square footage of the World Language classrooms is less than 693 square feet. When the 35 square feet per student is applied, the average maximum classroom capacity for the world language classrooms is 18. Therefore, the above comment submitted by the language teacher squares with this calculation. As noted earlier, Spanish is the most commonly accessed course. Spanish classes at East High School at times have had to accommodate up to 30 scholars making the space very limiting to promote a highly effective communicative learning environment for students. This can be summarized as follows, any world language class above 18 students is above capacity. Furthermore, as previously mentioned under Social Studies, classroom circulation is paramount for proper instruction. Teachers are expected to monitor student thinking and work so that timely feedback can be provided to feed student learning forward. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.

As it pertains to the scoring behind fixtures, having moveable furniture was identified as the greatest strength (average score of 2.54). However due to the size of the spaces, as noted above, the flexibility in which to arrange said furniture is limited as identified by the average score of 1.85.



Physical attributes was the highest score, mostly because all of the classrooms that currently support world language instruction have both direct and indirect access to natural daylight (average score 3.83). Access to adequate power (average score 2.02) was noted to be the greatest area for improvement. World Language teachers expressed in the comments that lack of access to outlets is a problem not only for ensuring that students are engaged in their learning by having battery life on their devices, but charging cords stretching across the room is a significant safety concern for students, and the teacher, moving through the spaces safely.

Overall Building - Common Spaces

Appendix AA outlines the assessed scores for the common spaces at East High School. The following three elements were identified to be of greatest concern based on the low scores.

Clearly marked and secure main entrance received an average score of 2.06 and was identified as the area of greatest concern. Comments related to this element speak of confusion for those not familiar with the school of where the main entrance is as there is no clear signage. Also emerging from the comments under this element it is noted that despite there being a main entrance, students enter through various doors throughout the day. Commenters further note that it is not uncommon for students to open exterior doors for one another as well as prop exterior doors open making it easy for anyone to enter the building. This is a significant security concern.

The second greatest concern identified by assessors (average score of 2.22) was related to staff access to staff only restrooms and bottle fillers within the same wing/quadrant as their primary work space. Comments related to this element make note that current restrooms dedicated to staff are outdated and small. The suggestion for added male only staff restrooms was also noted by multiple school-level respondents.

The library media space was identified as the third area of greatest concern with an average score of 2.33. At the time of the assessment, the library media space at East High School was multi-purposed. It is the meeting space for such events as staff meetings, professional learning, and PTA meetings. During the time of the assessment, it also served as the Academic Resource Center (ARC), the library media center, and a satellite study hall. Library media spaces should be a space in which teachers can bring their classes to engage in collaborative learning through the utilization of advanced technologies and text resources. Comments related to East's

library/media space state that classes rarely utilize the space as intended, the ARC is encroaching on the space that does exist for students and staff to collaborate, and that the space in general is dated.

A few other key notes as it relates to common learning spaces. East High School sits on a very small site. There is effectively no opportunity for any significant area of outdoor learning. Additionally, the campus does not have a sufficient number of parking stalls for students or event visitors. The street parking immediately outside of the school is timed and students must leave the school building during the day to move their cars, thus impeding students' time on academic tasks.

Wauwatosa East Findings Summary Analysis

Wauwatosa East High School epitomizes the historic charm that makes Wauwatosa a unique architectural community. Yet, despite some of the more recent updates made (visual arts, technology education, family and consumer education), the learning spaces continue to largely lag behind expected contemporary standards.

In summary, the overall instructional spaces at Wauwatosa East High School in greatest need of improvement to enhance student learning are those that currently support world language and social studies instruction. The visual art space that supports 3D course offerings (room 123) is in need of significant improvement simply to eradicate the safety and health hazards it currently presents. The instructional spaces that currently are dedicated to business education have been identified as best supporting the student learning.

When considering the elements that make up the subcategories of spatial layout, furniture, fixtures, and equipment, and physical attributes there were two elements that fell below the average 2 designation of “partially missing”. The first being access to adjacent small group collaboration spaces with an average score of **1.64 across the building**. Contemporary instructional pedagogy aims to provide students with ample opportunities to engage in peer collaboration and inquiry. Access to small group collaboration spaces promotes these opportunities for students. The long-range facilities study notes that consideration for departmental adjacencies should be given as there are few opportunities for convenient cross collaboration as currently organized.

The second element is access to **natural daylight with an average score of 1.83 across the building**. Many spaces in this building are internal and lack any access to daylight. The long-range facilities study states, as part of a general modernization of this building, strategies to bring daylight to as many student spaces as possible

should be considered including adding skylights, adding borrowed lights to corridors and using light shelves to bounce light deeper into the building. Increasing this would be supportive for staff and students' mental health. This is particularly important during winters in Wisconsin when the mental health of students and staff may need more attention.

In regards to the building's common spaces, increased security of the external doors as well as wayfinding to the main entrance is needed. Additionally, the library media space needs updating and a level-setting of how the space should be used to best support teaching and learning throughout the entire school.

In sum, while the exterior facade promotes the vintage charm of the community and evokes meaningful memories for alumni near and far, the fact remains that **the interior learning environment is instructionally obsolete**.

Wauwatosa West High School

Wauwatosa West High School, located at 11400 W. Center Street was constructed in 1967, making it the newest of the four secondary schools within the Wauwatosa School District. The pool was added in the 1970s. The site is bounded by Eisenhower Elementary School on the west, an interstate highway on the north and east and Center Street on the south. The school, along with playfields to the north, occupies 35 acres shared with neighboring Eisenhower Elementary School.

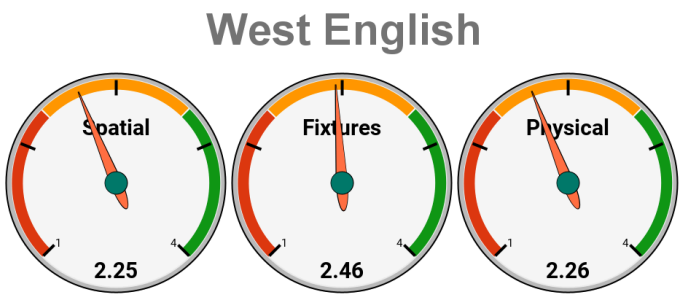
The facility is currently 297,631 square feet and serves students in grades 9 - 12. In regards to the functional school capacities calculation, Wauwatosa West High School passes two methods: (1) capacity by desired class size and (2) capacity by learning. However, method 3 - capacity based on gross building area is calculated below that of current student enrollment indicating that the building support spaces may be undersized for the student population served (Wauwatosa School District Long-Range Facilities Plan, May 2024, p. 113). In other words, Wauwatosa West High School is currently not properly configured to accept additional growth in student enrollment.

In the assessment of all four secondary schools, Wauwatosa West was identified as the healthiest facility when it comes to supporting the desired instructional state with an overall average score of 2.43 out of 4, marginally ahead of Wauwatosa East which had an overall average score of 2.4 out of 4.

Core Content Areas

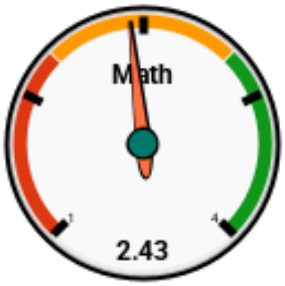
English. The instructional spaces that currently support English instruction at Wauwatosa West High School received an overall average rating of 2.46 with furniture, fixtures, and equipment identified as the strongest subcategory. While moveable furniture (average score of 2.98) was identified as the element of greatest strength within this subcategory, the lower rating of 2.6 under flexibility in furniture arrangement presents a challenge. Comments associated with this element highlight that the room size limits the options in which the furniture can be arranged which impacts the instructional options. For example, a school-based assessor noted a high-impact, student-centered instructional strategy that was attempted to be used which requires students to sit in a large circle. The educator had to abandon the strategy due space constraints. The lowest rated element was the teacher instructional preparation area with an average score of 2.11. Comments note that due to the size of the classrooms, this space is tight.

Physical attributes was the next highest rated subcategory with an overall average rating of 2.26. The lowest rated element was thermal comfort with an average score of 2. Qualitative information aligned to this element notes that at times of transition (before the boiler or the air conditioner are turned on to heat or cool the school) classroom temperatures are unpredictable. One school-based educator shared, “My room has been 80 degrees and 65 degrees depending on the time of year”. Fixed features (average score of 2.04) such as bookshelves and closets are largely absent from the English classrooms at West High School, hence the low rating. While these are largely missing, the positive is that there are no fixtures impeding educators’ ability to observe all students in the classroom. The third lowest rated element is associated with adequate power (average score of 2.07). Comments on this element express that there are not a sufficient number of outlets in various places within the rooms, thus necessitating the use of extension cords. A byproduct of this is the increased tripping hazards for students and staff circulating the classrooms.



The lowest rated subcategory was spatial layout with an average score of 2.25. Access to small group collaboration (average score of 1.4), shared space (average score of 2.18), and circulation access (average score of 2.24) were the three lowest rated elements. Of particular note rests with circulation access with comments sharing that the spaces are very crowded when students are present making students' and teachers' mobility through the space challenging. In particular, it was noted that if a student or staff member were in a wheelchair, they would not be able to freely move through a variety of the English learning environments. Instructionally, the inability to move freely throughout the classroom presents a significant barrier to serving students. Teachers are expected to monitor student thinking and work so that timely feedback can be provided to feed student learning forward. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.

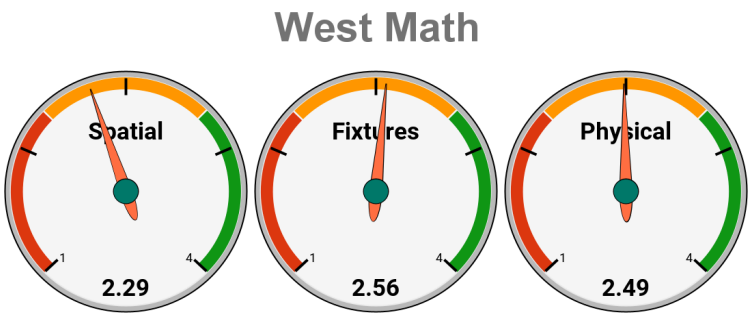
Mathematics. Of the four core content areas, **math received the highest rating with an overall average score of 2.43**. Similar to English, the most complementary subcategory was furniture, fixtures, and equipment with an average score of 2.56. Wall-boards for displaying instructional materials/resources (average score of 2.96) and moveable furniture (average score of 2.97) were the strongest elements under this subcategory. As previously highlighted at Wauwatosa East, Wauwatosa West also implemented an updated math curriculum in the 2016-2017 school year which coincides with the purchase of the current furniture and whiteboards in these classrooms. The element in most need of improvement is teacher instructional preparation areas which received an average score of 2.12. Comments associated with this rating elevated that instructional preparation space is very limited due to the small size of the classrooms. One school-based assessor noted the following, "I have to use the tops of the student desks and remove all materials before the students show up".



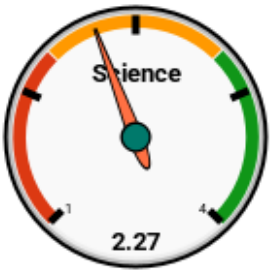
Spatial layout received the lowest overall rating with an average score of 2.29. Aside from access to adjacent small group collaboration spaces (average score 1.54), shared spaces (average score of 2.2) and circulation access (average score of 2.23) were elevated as the lowest rated elements. The size of many of the classrooms coupled with the number of desks needed to accommodate the number of students in the classes makes it challenging for extra space to remain for shared space purposes. Similarly, with upwards of 30 students and 30 desks in a classroom, it can be challenging for students and staff to freely circulate throughout the classroom. Classroom circulation is increasingly impossible should a student or staff member utilize a wheelchair. As previously mentioned under English, this presents a significant challenge instructionally. Teachers are expected to monitor student

thinking and work so that timely feedback can be provided to feed student learning forward. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.

Physical attributes found itself in the middle of the three subcategories with an average score of 2.49. Similar to the English classrooms, access to adequate power (average score of 2.14) emerged as a core concern. Related comments note that access is limited which prompts the use of power cords. This exacerbates the ability to move safely and freely throughout the classroom for both students and staff. Again, similar to English, fixed features (average score of 2.23) such as bookshelves and closets are largely absent from the math classrooms. While these are largely missing, again, the positive is that there are no fixtures impeding educators' ability to see all students in the classroom. Access to natural daylight was also identified as a concern (average score of 2.23). Positives identified by evaluators included lighting (average score of 2.94) and the overall aesthetics (average score of 2.84).



Science. Spatial layout (average score of 2.32) emerged as the strongest subcategory for the science classrooms at Wauwatosa West High School with technology adaptability as the greatest asset (average score of 2.56). Aside from access to small group collaboration spaces (average score of 1.9) and large group collaboration spaces (average score of 2.21), the greatest areas of concern that emerged are circulation access (average score of 2.21) and shared space (average score of 2.23). Comments related to shared space indicate that it is possible to create this space for student collaboration, but only if class size is limited and subsequently furniture can be removed. Similar to English and math, circulation access is a significant challenge. Comments underscore that the ability to comfortably move around the classrooms is "tight". Comments related to some classrooms state that wheelchair mobility is impossible. One of the most fundamental responsibilities of educators is to serve as the "guide on the side" as students engage in productive struggle and work through the learning process. If educators are not able to circulate the instructional space with ease, a significant part of the learning cycle is missing in the real-time feedback that teachers are able to offer students. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.



Furniture, fixtures, and equipment was the second highest rated subcategory with an average overall score of 2.27. Instructional preparation areas were identified as the greatest asset with an average score of 3.03. This is largely due to the inner storage area that also serves as a preparation area connected to a number of classrooms. One school-based commenter noted that the layout could be improved to provide greater functionality as well as the removal of "old junk". Fixtures/equipment was identified as the element of greatest concern with an average score of 2 out of 4. The following are missing or not visibility present in some of the science classrooms. In a fully functional science classroom, it is a minimal expected that these fixtures/equipment be present:

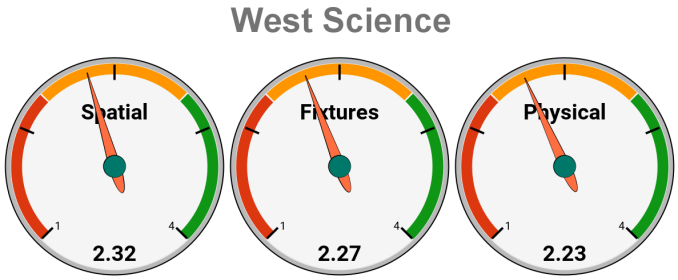
- Fume hoods;
- Gas lines;
- Eye wash station;
- Fire blanket;
- Fire extinguishers; and
- First aid kits.

Additionally, in classrooms where lab stations are present, they are mostly situated along the perimeter of the classroom which is an instructional challenge. This impedes instructors' abilities to see student actions during labs to not only support their learning as that "guide on the side", but it also impedes their ability to supervise

proper safety procedures. Flexibility in furniture arrangement received the second lowest rating under this subcategory with an average score of 2.05. Related comments to this element note the following as impediments to flexible furniture arrangements:

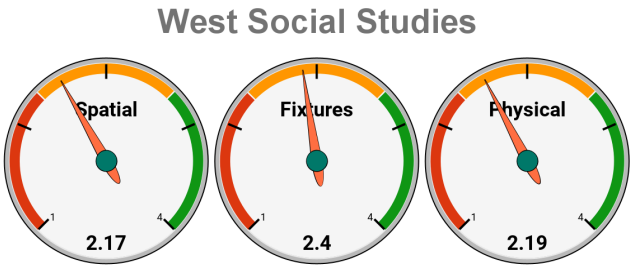
- A fume hood is located in the center of rooms 115 and 118;
- Room 128 has large furniture pods on wheels, but due to their composition and size cannot be reconfigured in a more flexible manner within the space; and
- Large inflexible tables.

Other comments noted that many of the classroom arrangements are mostly fixed as there is limited space in which to arrange furniture differently.



The physical attributes subcategory received the lowest rating with an overall score of 2.23. The lowest scoring element was that of access to natural daylight with an average score of 1.05. The second lowest rated element was that of fixed features with an average score of 2.21. Related comments note that the location of fume hoods in some rooms as well as labs around the periphery of the classroom impeded instructors' ability to see all of the in-progress instructional activities. One school-based evaluator shared, "students face away so I cannot see what they're doing without being right next to them". Relatively speaking, acoustics received a more favorable rating with a 2.44 average; however, qualitative data suggests that deeper exploration may be needed in some of the classrooms. One school-based evaluator noted, "You can hear everything through the walls". The elements that received the highest ratings were that of adequate light/dark control and site lines, both with an average score of 2.51.

Social Studies. The classrooms that currently support social studies instruction received the lowest overall score (2.23) for the core content areas at West High School and received the second lowest overall score for all content areas just behind visual arts (average score 2.09). Spatial layout was the subcategory identified in greatest need of improvement with an average score of 2.17. Lack of adjacent small group collaboration space (average score of 1.22) received the lowest rating. This was followed by shared space (average score of 2.09) and circulation access (average score of 2.17). Comments submitted by evaluators noted that the classroom spaces are very "tight" especially when it is necessary to have seating accessible for up to 30 students, thus leaving little to no shared space available. As a result, ease of circulation for students and staff is also compromised. A school-based evaluator shared that they are, "Constantly tripping over chords and backpacks every day" while another shared, "The teacher is able to easily access only the front of class. They cannot navigate to the rear". Another shared, "We have had concerns, particularly in 208 and 224, regarding space for our students who may be in wheelchairs. There is often limited mobility for them, and limited spaces for them to sit and be in the classroom". As previously identified in the other core content areas, this is a significant concern from an instructional lens. The inability to move freely throughout the classroom presents a significant barrier to serving students. Teachers are expected to monitor student thinking and work so that timely feedback can be provided to feed student learning forward. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning. However, personal space was identified as the greatest asset within this subcategory with an average score of 2.45. Yet, related comments to personal space elevate that students' personal space is relatively limited in many classrooms.



The physical attributes subcategory received the next highest rating with an overall average score of 2.19. Site lines were identified as the greatest asset within this subcategory (average score of 2.65). Recessed doors were noted the most in the comments which impede site lines into the classroom/hallway. This is not

necessarily an instructional concern, rather it is more of an overall school safety concern. Natural daylight (average score of 1.46), thermal comfort (average score of 1.99) and adequate power (average score of 2.04) were identified as the elements in greatest need of improvement. The social studies rooms by and large do not have direct or indirect access to natural daylight. Related to thermal comfort, similar to the English classrooms at Wauwatosa West, it was noted in the comments that social studies classrooms also see unpredictable classroom temperatures. Polarizing temperatures makes concentration and engagement challenging for students and staff. In regards to adequate power, comments submitted noted that power cords are utilized for students to have charged Chromebooks so that they can access instructional materials. If students do not have access to these instructional materials they are not able to properly engage in the day's learning. With the addition of power cords, the circulation about the classroom for staff and students becomes further compromised.

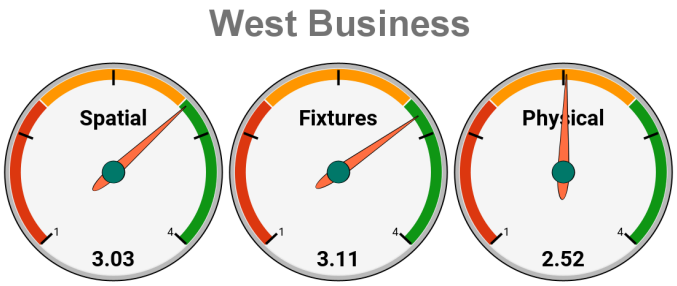
Furniture, fixtures, and equipment was identified as the strongest subcategory within the social studies department with an overall average rating of 2.4. Moveable furniture was rated the highest (average of 2.93) indicating that the furniture is mostly sufficient. Coupled with the challenges lifted up under the spatial layout subcategory, due to limited shared space and circulation challenges, educator instructional preparation areas (average score of 2.03) are also wanting.

Elective Offerings

Business. Business classes are currently run out of one classroom. As a result, what is articulated in this section is reflective of only one classroom at West High School - room 230. Additionally, **business has emerged as the highest rated content area when the *Analysis of Learning Spaces* rubric was applied with an average overall score of 2.86**.

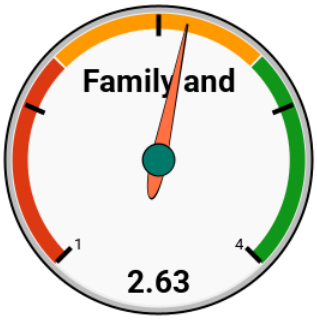
Furniture, fixtures, and equipment was the highest rated subcategory with all elements within the subcategory rating at a proficient level.

The elements under the spatial layout subcategory were also largely identified as proficient with the exception of access to adjacent small group and large group collaboration spaces. Both elements received an average score of 2.57.



Physical attributes was the subcategory that did not meet proficiency by assessors. Within this subcategory there were two elements that did meet proficiency standards - acoustics (average score of 3.14) and adequate light/dark control (average score of 3). The other elements averaged less than a 3 with fixed features (average score of 2.14) and access to natural daylight (average score of 1) rating the lowest.

Family and Consumer Science. The spaces that are currently used to support family and consumer science education at West High School emerged as the third highest rated content area when the *Analysis of Learning Spaces* rubric was applied (average score of 2.63). The culinary arts lab space has been recently renovated, and this program has seen significant interest from students in recent years.

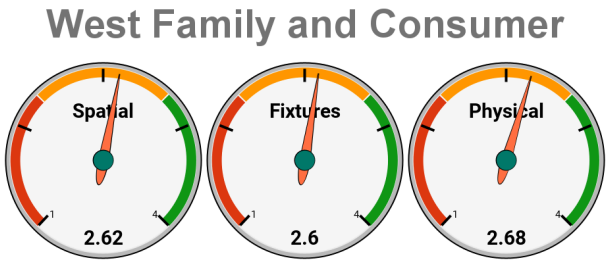


The physical attributes subcategory scored the highest with natural daylight (average score of 3.27) and overall aesthetics (average score of 2.87) as the most supportive elements. Adequate power (average score of 2.27), site lines (average score of 2.4) and fixed features (average score of 2.4) were the elements in need of greatest improvement. Comments associated with this subcategory mostly noted the safety concern with classrooms largely not visible from the hallway.

Spatial layout was the second highest rated subcategory with an average score of 2.62. Access to adjacent large group collaboration spaces was rated the lowest with an average score of 2.4 while access to storage was rated as sufficient (average score of 3 out of 4). While adequate space for programming was rated at 2.6, deeper study revealed that this may be an inflated rating. As previously stated, this program has seen increased interest in recent years. In fact, the lab space at West High School is used every class period of the day each semester. During the 2024-2025 school year, **student interest actually demanded more sections of Culinary Arts 1 and 2.**

However, due to limited lab space, additional sections could not be run. Therefore, space and consideration for an expansion of this space may be prudent as part of a larger modernization project.

Furniture, fixtures, and equipment emerged as the lowest rated subcategory (average score of 2.6). Space for physical models was identified as the greatest asset with an average score of 2.8 while wall-boards for displaying instructional materials and resources (average score of 2.47) emerged as the greatest area for improvement within said subcategory.

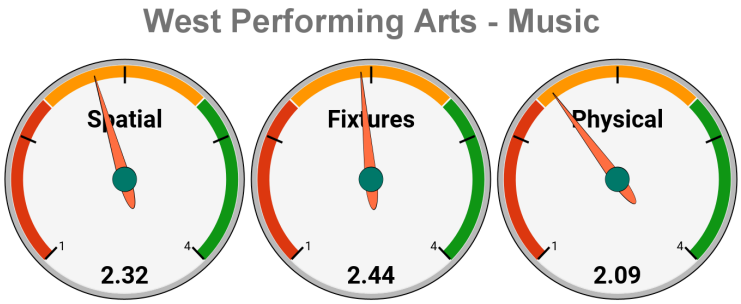


Performing Arts - Music. Furniture, fixtures, and equipment was the subcategory that emerged as the most supportive subcategory (average score of 2.44). Instructional preparation area received an average rating of 2.92 and was the highest rated element within this subcategory. Rated the lowest were fixtures/equipment and flexibility in furniture arrangement, both with an average score of 2.15. The comments submitted around fixtures/equipment note a need for more whiteboards as well as more flexibility in music storage spaces. The comments submitted around furniture arrangement express limited options for there to be flexibility in furniture arrangements due to tiered flooring.

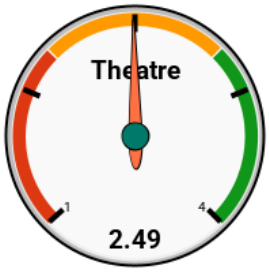
Spatial layout was the second highest rated subcategory for music with an average score of 2.32. Access to adjacent large group collaboration spaces received a proficient rating with an average score of 3.08. Conversely, access to adjacent small group collaboration spaces received the lowest average score (1.92). Also receiving an average score of 1.92 was technology adaptability. Comments related to technology reveal that there is a need to update devices so that displays are larger, more prevalent, and less blurry.

Lastly, physical attributes is the lowest rated subcategory. Access to natural daylight (average score of 1) and overall aesthetics (average score of 1.92) received the lowest ratings. In regards to overall aesthetics comments submitted divulge the following:

- Carpet is worn;
- Ceiling tiles have a tendency to fall;
- Large black stains are prevalent on the ceiling; and
- In general the spaces present as dated and worn.



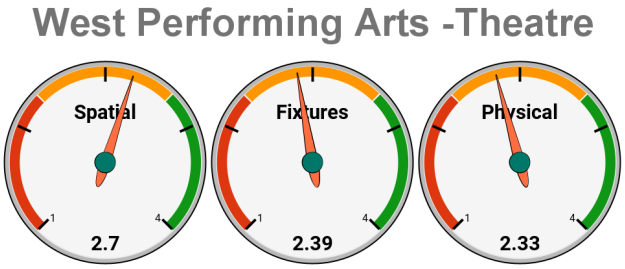
Performing Arts - Theatre.. The theatre space received an average score of 2.49 when the *Analysis of Learning Spaces* rubric was applied. From a daily instructional standpoint, the space largely supports the instructional objectives. However, when considering the larger needs of such a facility, the long-range facility study best captures the needs of this space. What follows is what has been reported out in said study.



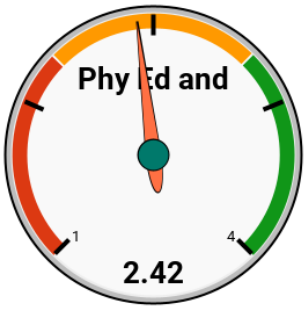
The theatre at West High School, which seats 838, features areas designed to provide wheelchair accessibility. Seats are original to the theatre and are at the end of their useful life. Some seats are not usable and there are no replacement parts.

- The lighting board is 10 years old and at capacity; it should be replaced. Some system maintenance is needed and a small percentage of original light fixtures remain.
- The sound board and components are obsolete and need replacement.
- Stage curtains are in poor condition and were identified as needing replacement in 2016.
- Dressing room space is extremely limited and lighting is original. Dressing rooms are small and inadequate for large casts of students. Restroom facilities are original and non-functioning. Part of the set storage is used as a girls dressing room.
- Storage is not adequate and presents challenges for productions.
- Scene construction shop space is somewhat adequate but needs additional electric circuits and a dust collection system.

- The fly system has damaged arbors, rusty wire rope and inadequate batten connections.
- The rigging system has not been inspected since 2016. A theatre consultant should inspect the theatre's rigging and fly areas on an annual basis.
- Restrooms near the theatre are lacking in size and do not meet current ADA standards.
- The venue lacks a direct, ADA accessible route to the stage.



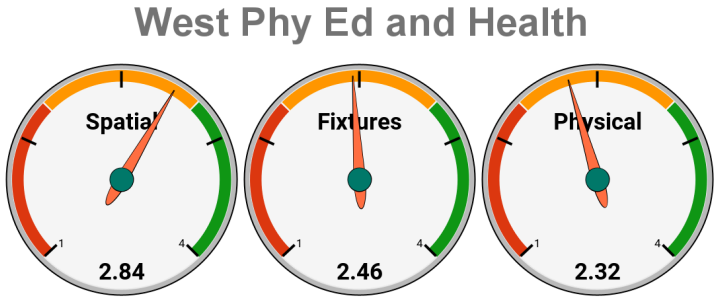
Physical Education and Health. The physical education and health spaces at Wauwatosa West received an average overall score of 2.42 out of 4 when the *Analysis of Learning Spaces* rubric was applied. Spatial layout was the subcategory that received the highest rating with an average score of 2.84. Access to adjacent large group collaboration spaces was identified as the greatest asset with an average score of 3.26 and technology adaptability received the lowest average rating with a score of 2. Comments related to technology adaptability share that current displays are either missing or too small. Technology in the health room was deemed to be proficient. Access to a mobile electronic display board was also noted.



Furniture, fixtures, and equipment was the second highest rated subcategory. Wall-boards for displaying instructional materials were elevated as in greatest area of need (average score of 1.95) while space for physical models and equipment was the most supportive element (average score of 2.95).

The lowest rated subcategory was physical attributes. Natural daylight was identified as the greatest asset with an average score of 2.47 while adequate light/dark control was elevated as the greatest area of improvement. Comments related to light/dark control state that dimmers are not present. Acoustics emerged as one of the lower rated elements with an average score of 2.32. Associated comments express concerns with no visual cue to alert students and staff that there is an announcement in progress. In the event of a true emergency staff and students in the gyms may miss out on important information. As it pertains to the classroom

currently used for health class, comments note that voices from other classrooms can be heard within the space.



While it is not a state requirement, the physical education curriculum in the Wauwatosa School District is privileged to offer aquatics instruction at Wauwatosa West High School due to the presence of the swimming pool. As communicated in the long-range facilities study, the pool was constructed in the early 1970's making it approximately 50 years old. A 2024 professional evaluation of the pool recommended a significant investment be made to the pool basin, piping/filtration systems, and diving board structure. Associated costs to address these recommendations are not yet identified in the District's capital improvement plan.

Furthermore, the long-range facility study provides additional context that deserves to be overlaid in this report. What follows is additional language has been included in the long-range facility report around gym spaces at West High School.

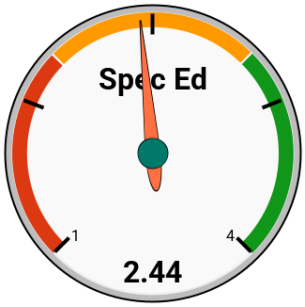
Gym space is significantly undersized for a high school of this size. It would not be uncommon for a school of this size to have a four station fieldhouse to accommodate physical education classes and athletic team practices. All interior athletic venues and auxiliary spaces are original to the 1957 construction and in poor condition. Some spaces originally assigned to athletics have been repurposed for other uses. In general, the interior spaces at West that support athletics are substandard and considered the worst in the conference. From a physical education and athletic offering perspective, Wauwatosa West is severely limited in its ability to offer adequate events and services when compared to other conference schools.

In general the outdoor venues assigned to athletics are in relatively good condition. Some auxiliary components, lighting, sound systems, storage, etc. are in poor condition. Seating capacity is limited and not ideal for hosting sectional level play.

- Gymnasium seating capacity is approximately 1,000 seats. There is insufficient restroom capacity to support this level of attendance and the restrooms do not meet current ADA standards.

- The gymnasium and locker rooms are original to date of construction, do not meet current ADA standards, and are in poor condition/at the end of their useful life.
- The gymnasium is not air conditioned and poses a safety hazard for participants under certain humidity and temperature conditions.
- Storage and associated amenities are substandard. Locker rooms are at the end of their useful life, not-ADA accessible and require remodeling.
- The weight room and fitness equipment are undersized, in poor condition, and make it difficult to safely and effectively work with athletes and students.
- Sectionals cannot be hosted and larger events that other schools in the conference are capable of holding cannot be held at West.
- The primary entrance is not clearly identified or easily accessible.

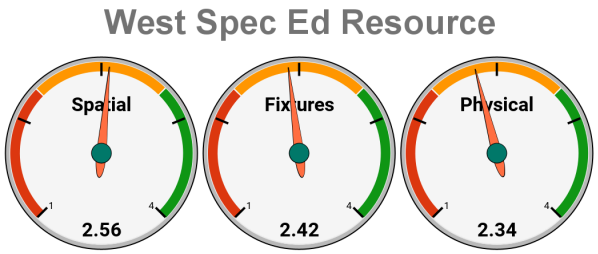
Special Education - Resource. Spaces serving the special education program at Wauwatosa West High School are distributed throughout the building. Many are full size classrooms or other, smaller classrooms. This use of space is aided by the current enrollment being lower than the building's target capacity. Spatial layout emerged as the most supportive subcategory with an average score of 2.56.



Despite this, comments from school-based educators indicate that the current space does not support student needs, in particular on days in which there are assessments. On days in which the number of assessments are high, finding the necessary space for students requiring a separate assessment setting per their individualized education plan (IEP) is a challenge. Furthermore, comments state that on assessment days the only current options available are the library, the Academic Resource Center, or the Steiner Center. While these spaces can support a larger number of students, it is not the most conducive testing environment for students that may benefit from a distraction-free environment as the aforementioned spaces are high-traffic areas.

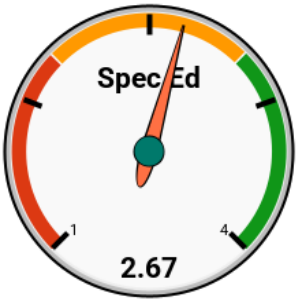
Furniture, fixtures, and equipment was the second highest rated subcategory with an average score of 2.42. Wall-boards for displaying instructional materials/resources received the highest rating with an above sufficient rating of 3.25. Instructionally, this is supportive in providing students with extra visual support to aid their learning. Instructional preparation areas received the lowest score with an average rating of 1.5. Staff are often working in rooms that are not designed to best support their work. Access to flexible learning spaces around the building is limited, necessitating meeting in places remote from a student's main classroom. A school-based evaluator shared the following comment in relation to this element, "We are sharing

2.5 rooms between seven teachers and have at least 11 self contained classes between those classrooms. This forces us to have to share desks and prevents some of those owners of the desk from having their own space to prepare materials. On top of this we are having students consistently coming up to the desk that has not only the teachers materials for the day there, but also the owner of the desk's materials which may or may not be confidential".



Physical attributes was the lowest scoring subcategory with an average score of 2.34. Adequate light/dark control, fixed features, site lines, and overall aesthetics were all identified as strengths with sufficient scores of 3 out of 4. Access to natural daylight (average score of 1) and acoustics (average score of 1.5) were the lowest rated elements of this subcategory. In regards to acoustics, noise pollution is an area of concern. The following comment was submitted by a school-based assessor, "The walls are extremely thin between the classrooms, so providing a quiet small environment is next to impossible". For students that are easily distracted, the identified noise pollution is not a supportive feature of their current learning environment.

Special Education - Vocational Studies. Similar to Wauwatosa East, the vocational studies program at Wauwatosa West High School supports students in their development of independent living skills such as cooking, cleaning, laundry care, as well as other executive functioning skills. The skills developed through this program can also be transferred to employability skills.

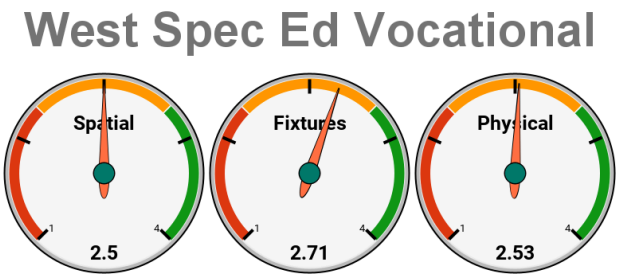


Furniture, fixtures, and equipment was the highest rated subcategory with flexibility in furniture arrangement and wall-boards for displaying instructional materials/resources receiving sufficient ratings - both with an average score of 3. Instructional preparation area, space for physical models/equipment, and fixtures/equipment were all the lowest rated elements all with an average overall score of 2.5. A school-based evaluator shared the following comment related to space for physical models/other equipment, "Need more storage space in main classroom in order to store and have

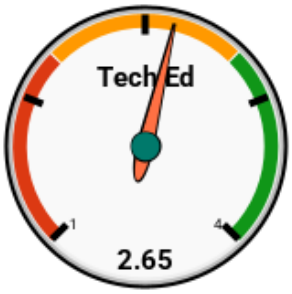
good access to physical models. Voc Skills classes have many "job bins" which students should have easy access to. They currently do not in this classroom set up".

Physical attributes surfaced as the next highest rated subcategory with an average score of 2.53. Acoustics were the highest rated element and identified as sufficient with an average score of 3. Adequate power received the lowest rating with an average score of 2. Thermal comfort and adequate light/dark control received average scores of 2.25 each. Comments submitted by school-based assessors on thermal comfort noted the extreme polarization of temperatures stating, "Frequently too cool when A/C is on, too hot when heat is on". Regarding adequate light/dark control, school-based evaluators shared, "Old light fixture does not allow for dimming of overhead lights. In a SPED space, the ability to flex lighting is imperative. Current classroom is being lit by string lights to allow for dimmer (less harsh) lighting".

Spatial layout materialized as the lowest rated subcategory with an average score of 2.5. Personal space, shared space, and circulation access were all elevated as strengths under this subcategory with all evaluated with a sufficient score of 3.25. Access to adjacent small and large group collaboration spaces received the lowest scores with an average of 1.5. Comments submitted indicate that current storage spaces could be repurposed for small group or individual work with a student.



Technology Education. The space that supports technology education received the second highest rating when the *Analysis of Learning Spaces* rubric was applied with an average overall score of 2.65. This space has seen a recent renovation. Physical attributes was the subcategory with the highest rating with an average score of 2.72. Access to natural daylight was the highest rated element with an average score of 3.5. Adequate power and site lines also received sufficient ratings both with a 3.08 out of 4 rating. Acoustics emerged as the lowest rated element with an average score of 2.17. Comments submitted note that there is air flow humming polluting the acoustics and there is no visual cue to alert students and staff of bells sounding or that there are announcements occurring. With the loud equipment used in the space, this presents a safety concern. Similar to physical education, in the event of a true emergency staff and students in this space may miss out on important information. Adequate light/dark control and thermal comfort both received an average score of 2.33. Comments indicate that the scores are mostly reflective of lack of window coverings and the inability to control the temperature inside the classrooms.

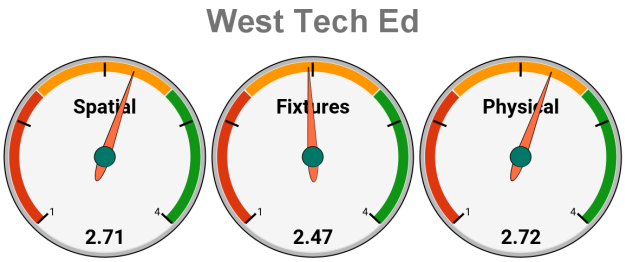


The subcategory of spatial layout had an average overall score of 2.71. Personal space was identified as the most supportive element with an average score of 2.92. Technology adaptability was identified as the element in greatest need of improvement within this subcategory with an average score of 2.42. Comments submitted indicate that technology is either missing, dated, or undersized. In spaces where technology is undersized students may have challenges seeing what is projected. Additionally, the technology may also be challenging for students to see from certain angles due to the geography of the room.

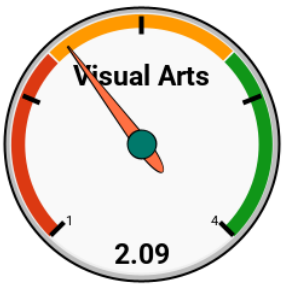
Under furniture, fixtures, and equipment, space for physical models/equipment was identified as the greatest asset with an average score of 2.83. Given the fact that there was a recent renovation and that this content area requires access to a variety of equipment, it is promising that the spaces are on the border of sufficient. The elements receiving the lowest ratings, all with an average score of 2.25, were moveable furniture, flexible furniture arrangements, and wall-boards for displaying instructional materials. Comments indicate that furniture flexibility may be ok given the purpose of the space, however wall-boards, especially vertical white boards, are largely missing. Knowing that a lot of planning and ideation needs to go into student projects, from an instructional standpoint, the lack of access to this instructional tool presents a gap in the learning process.

Finally, the long-range facilities study highlights that corrective measures need to be taken to address dust passage from the woods side of the shop to the metals side.

Additionally, a wheelchair accessible route needs to be added to the recessed lab spaces.



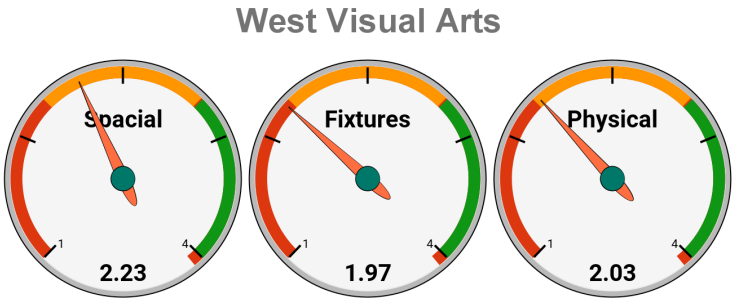
Visual Arts. The visual arts spaces at Wauwatosa West High School received the lowest overall average score at the school with a rating of 2.09. The subcategory of spatial layout was identified as the greatest asset with an average overall score of 2.23. Within this subcategory personal space was the most supportive (average score of 2.69). Circulation access (average score of 2.06) and access to adjacent small group collaboration spaces (average score of 1.44) were identified as the elements in most critical need of attention. With regards to circulation access, comments summarize that circulation is limited. One school-based evaluator shared, "with student bodies, and backpacks we are not able to move freely or safely in this room, it needs less students or more square footage". Another school-based evaluator shared that more square footage is needed to spread out equipment, tables, and storage. As elevated in other content areas, this is a significant concern from an instructional lens. The inability to move freely throughout the classroom presents a significant barrier to serving students. Teachers are expected to monitor student thinking and work so that timely feedback can be provided to feed student learning forward. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.



Physical attributes was the next highest rated subcategory with an average score of 2.03. Contributing to the score is access to natural daylight (average score of 1.34), overall aesthetics (average score of 1.56), and adequate light/dark control (average score of 1.94). Comments related to overall aesthetics note that the visual art spaces have been largely neglected for years, with the exception of the recently converted athletic space into a visual art space. Further details state that there are holes in the walls, ceiling tiles are falling apart, cabinet doors are falling off, and paint is missing on the walls. In short, the space is visually uninspiring. The greatest asset to this subcategory is acoustics with an average score of 2.44. While quantifiably this

element was identified as the greatest asset, accompanying comments state that noise from other classrooms can be heard within these learning spaces.

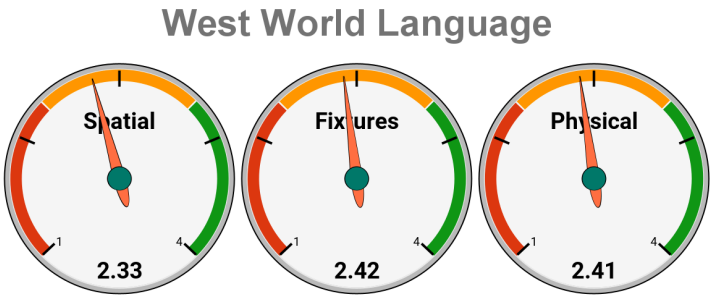
The lowest rated subcategory was furniture, fixtures, and equipment with an average score of 1.97. The highest rated element within this subcategory was moveable furniture with an average rating of 2.31. Related comments elevate that the furniture is moveable, but there is no space in which to move it, or the furniture is very heavy duty and inflexible. Wall-boards for displaying instructional materials/resources emerged with the lowest average rating (average score of 1.63).



World Language. Furniture, fixtures, and equipment was the subcategory that emerged as the most supportive to world language instruction at West High School. Moveable furniture was identified as the greatest asset with an average score of 2.7. One school-based assessor shared appreciation for desks with separated chairs by saying that they, "are awesome" because "They accommodate all students". Fixtures/equipment emerged as the element in greatest need of improvement. Related comments note that bookshelves are largely missing or were purchased with educators' own funds.

The second highest rated subcategory for world language was physical attributes (average score of 2.41). The most supportive element within this subcategory was acoustics with an average score of 2.64. A few comments emerged that noise pollution exists from neighboring classrooms and the nearby highway. Thermal comfort was the element that received the lowest rating with an average score of 2.12. Individual educators do not have the ability to control the temperature in their classrooms. A few school-based evaluators noted that it is often too warm for comfort in their classrooms, especially in the afternoon.

Spatial layout received the lowest score subcategory score with an average of 2.33. With an average score of 1.52, the lowest rated element was access to adjacent small group collaboration spaces. The second lowest rated element was circulation access with an average score of 2.24. Comments submitted with circulation access express concerns about the size of the classroom stating that they are “undersized”. Due to the size, educators are more or less forced into a lecture-based approach. Comments further suggested that desks should be removed to increase circulation access, however, then there would not be enough desks to accommodate the number of students. One school-based evaluator summarized their experience in their classroom related to circulation access, “I am able to move, but with difficulty. I am often confined to the front of the classroom when delivering direct instruction because of the difficulty in being able to move about the classroom. Since there is limited personal space, there are often backpacks in the aisles, posing a tripping hazard for me and the students. There are often Chromebook charging cords that cross over the aisles, since there are limited outlets in the room”. As previously identified in the other core content areas, this is a significant concern from an instructional lens. The inability to move freely throughout the classroom presents a significant barrier to serving students. Teachers are expected to monitor student thinking and work so that timely feedback can be provided to feed student learning forward. This is particularly important in supporting language acquisition. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.



Overall Building - Common Spaces

Appendix AB outlines the assessed scores for the common spaces at West High School. The following three elements were identified to be of greatest concern based on the low scores.

Student restrooms and access to a bottle filler within each wing/quadrant of the building was identified as the greatest area of concern at West High School with

an average overall score of 1.79. School-based assessors shared the following comments in relation to this element.

- “Students complain that they are unable to use the bathroom between classes because all of the stalls are full”.
- “Need more water bottle fillers. Many bathrooms are outdated with poor washing stations & old doors”.
- “Restrooms need to be updated. We need more bottle fillers. Trans and non-binary students should get additional suitable restrooms”.
- “We literally have bathrooms locked up with the ceiling falling down”.
- “Only one handicap accessible bathroom located on first floor, used by any student so it may not always be accessible when needed”.
- “Students often complain about lack of access to bathrooms, locked bathrooms, or water fountains being extremely old/disgusting”.
- “There's only one water bottle filler on the 2nd floor and the bathrooms consistently have long lines for them during passing periods”.
- “Gender neutral bathrooms are limited and unmarked. Additionally we do not have any on the 2nd floor”.

Instructional spaces to best support special education services was identified as the second greatest area of concern at West High School with an overall average score of 1.86. School-based assessor comments reflect that sensory/calming spaces are lacking and where they are available they are often occupied for purposes other than student calming such as meetings or a student assessment location. As previously mentioned, more space is needed for students to take assessments in a distraction-free environment. Additionally, multiple staff members are currently required to share rooms which further compounds the aforementioned issue of providing students with distraction-free spaces to take assessments. For example, a special education teacher may be working with an individual or small group of students in a space that they share with another special education teacher. This becomes problematic when the other teacher needs to assist a student in taking an assessment in a distraction-free environment.

The third element in greatest need of improvement at West High School was identified as the administrative services suite with an overall average score of 2.11. Qualitative data collected from school-based assessors highlight the lack of conference rooms/meeting spaces as the crux of the rationale for the low rating. Staff note that additional space is needed to support the vast array of meetings that take place on a daily basis, including meetings hosted by special education case managers for students’ IEPs. They also noted that space is needed to better support in-school suspension needs. Furthermore, commentary submitted shared that the conversations that occur in the current conference room located in the main office can be easily heard, thus compromising privacy and confidentiality.

Wauwatosa West Findings Summary Analysis

Despite being the most contemporary secondary school building in the District (constructed in the 1960s) and receiving the highest overall rating against the *Analysis of Learning Spaces* rubric with an overall average score of 2.43, there are many aspects of the building that do not meet the requisite learning needs of students 60 years later.

The instructional space that is currently dedicated to business education has been identified as best supporting the student learning. The content areas in greatest need of improvement include visual arts (overall average score of 2.09), social studies (overall average score of 2.23) science (overall average score of 2.27), English (overall average score of 2.27), performing arts - music (overall average score of 2.27). Within these content areas it was elevated that **circulation access is a significant barrier**. From an instructional standpoint, the inability to move freely throughout the classroom presents a significant barrier to serving students. Teachers are expected to monitor student thinking and work so that timely feedback can be provided to feed student learning forward. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning. **This must be remedied in order for students to receive the expected level of instruction.**

When considering the elements that make up the subcategories of spatial layout, furniture, fixtures, and equipment, and physical attributes there were two elements that fell below the average 2 designation of "partially missing". The first being access to adjacent small group collaboration spaces with an average score of **1.9 across the building**. As previously stated, the school-based staff members that completed the rubric noted this as a significant need, in particular in supporting small group and individual instruction/testing for students that receive special education services.

The second element is access to **natural daylight with an average score of 1.98 across the building**. Many spaces in this building are internal and lack any access to daylight. The long-range facilities study states, as part of a general modernization of this building, strategies to bring daylight to as many student spaces as possible should be considered including adding skylights, adding borrowed lights to corridors and using light shelves to bounce light deeper into the building. Increasing this would be supportive for staff and students' mental health. This is particularly important during winters in Wisconsin when the mental health of students and staff may need more attention.

As it pertains to the common spaces at West High School, improvements in student restrooms and bottle fillers is of greatest concern. Also of greatest concern to be remedied include additional spaces for special education needs mostly to support students requiring separate testing environments per their IEPs. Finally, the number of conference rooms needed as well as space for large teams to meet in the administrative offices needs to be increased and expanded.

In sum, despite Wauwatosa West High School being the most contemporary building within the secondary school portfolio in the District, **the interior learning environment is instructionally obsolete**.

Overall High School Findings Summary Analysis

In an effort to address essential question #2, "To what extent is the student experience the same across both middle schools and both high schools?", the following similarities exist between two high schools. A particularly curious and troubling similarity from both high schools is the challenge for staff and students to circulate instructional spaces easily. At Wauwatosa East High School, this emerged as a barrier in the following content areas: (1) English, (2) family and consumer science, (3) performing arts - music, (4) social studies, (5) special education - vocational studies, and (6) world language. At Wauwatosa West High School this was identified in the following content areas: (1) English, (2) math, (3) science, (4) social studies, (5) visual arts, and (6) world language. As noted in the literature, it is imperative for there to be ample space in the classroom for educators and students to access one another (Evertson & Emmer, 2009). As a result of this barrier, it should be of no surprise that school leadership teams have identified antiquated, non-student centered instructional practices (e.g. lecturing) as a core practice in many classrooms. It should also come as no surprise that Wauwatosa largely lacks a culture of feedback (teacher to student, student to teacher, teacher to teacher, and administrator to teacher). The design of certain instructional spaces does not foster an environment where feedback can be readily provided, thus eliminating a pivotal part of the learning process. **Above all else, teacher and student ability to circulate through the learning spaces needs to be improved upon. If it is not corrected, it should be expected that educators will continue to lean on outdated practices and students will not get the real-time feedback that they deserve.**

Access to natural daylight as well as access to adjacent small group collaboration spaces fell below the 2 designation of "partially missing" at both high schools.

Therefore, students at neither school are advantaged by having more access to one of these elements over the other school.

The athletic facilities at both high schools are not commensurate with contemporary athletic spaces in other school districts. A school district the size of Wauwatosa should, at a minimum, accommodate four basketball courts. As such, students at neither school are advantaged by having more access to one of these elements over the other school.

A key difference is that the technology education space at East supports instruction around construction and the space at West supports instruction around manufacturing. Therefore, the students at East are disadvantaged to access to manufacturing instruction, and students at West are disadvantaged to access to construction instruction.

As it pertains to common spaces at the high schools, each building has its own unique current challenges. The greatest challenges at East High School include the security of the external doors and main entrance wayfinding, the functionality of the library media center, and staff restroom and bottle filler access. At West High School, the greatest current challenges include functionality and lack of access to student restrooms, lack of space for special education services, and lack of number and sufficiently sized conference rooms. While there is a difference in the most critical concerns of the common spaces at both high schools, it should be noted that none of the common spaces evaluated at either school earned a “sufficient” score as assessed by both building-level evaluators and members of the FST.

To reiterate, **the interior learning spaces at Wauwatosa East and Wauwatosa West are instructionally obsolete**.

Longfellow Middle School

Longfellow Middle School, located at 7600 W. North Avenue was constructed in 1956. The site is bounded by 80th Street on the west, Wauwatosa Cemetery on the north, Wauwatosa Avenue on the east and North Avenue on the south. The school, with the playfields to the west, occupies the majority of a two block area (19.9 acres).

Today it is 191,200 square feet serving grades 6 - 8. In regards to the functional school capacities calculation, Longfellow Middle School passes all three methods: (1) capacity by desired class size, (2) capacity by learning, and (3) capacity based on gross building area (Wauwatosa School District Long-Range Facilities Plan, May 2024, p. 100).

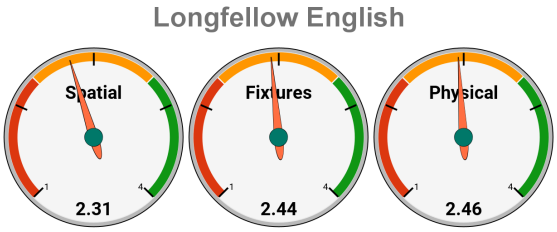
Core Content Areas

English. The spatial layout of the instructional spaces that are currently used for English instruction was identified as the subcategory least supportive of desired instruction. Most problematic is access to small (average score of 2.12) and large (average score of 1.65) adjacent collaborative spaces. Additionally, comments related to this subcategory notes that the space is somewhat confining to allow for fluidity of small group and large group instruction when class sizes are on the higher side (26+ students).

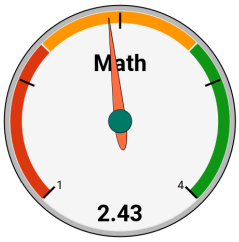
In regards to furniture, fixtures, and equipment, moveable furniture was identified as the greatest need to better support instruction with an average score of 2.34. Rated as the subcategory's instructional strength was adequate space for instructional equipment with an average rating of 2.56. Despite this being the highest rated element under this subcategory, comments related to this topic indicate that additional space is needed to better support student and teacher access to a variety of texts.

Physical attributes were identified as the most supportive subcategory to the desired instructional state. The greatest asset is access to natural daylight (average score of 3.23). The greatest area for improvement is adequate power (average score of 1.96). Teacher comments reflect spaces in which power outlets do not work as well as not having enough power sources at various points in the classroom to support students' needs to charge Chromebooks. Tripping hazards are created with cords lying on the floor throughout classrooms. The second greatest area in need of improvement is in regards to acoustics (average score of 2.26). Comments related to this element

reflect that it is often difficult for teachers and students to hear one another due to noise pollution from the HVAC system.



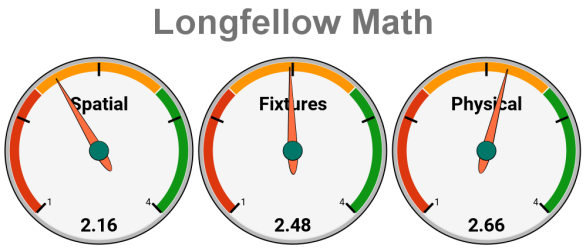
Mathematics. Of the core content areas, **math had the highest overall average score with a 2.43**. The current spaces at Longfellow that support math instruction were identified to have relative sufficient strength in regards to their physical attributes. The highest contributing element to the overall average physical attribute score of 2.66 was that of access to natural daylight (average score of 3. 54). Bringing down said score is the area of greatest concern under this subcategory being adequate access to power with an average score of 1.82. Circulation access (average score of 2.13) was also identified as an area of concern. This data point further speaks to the concern illuminated in the comments around class size and the limited space for students to move and fit comfortably, especially when classes are in excess of 30 students. Further noted in the comments on this topic was that this is further problematic when classes are over 30 students for the physically larger 8th grade students. Additionally, the inability to move freely throughout the classroom presents a significant barrier to serving students. Teachers are expected to monitor student thinking and work so that timely feedback can be provided to feed student learning forward. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.



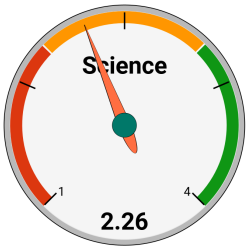
Within the subcategory of fixtures, wall boards for displaying instructional materials and space for students to make their thinking visible via whiteboards was identified as the greatest area of strength with an average score of 2.8. Similar to the high school's adoption of its current math curriculum in 2016, the middle schools saw a similar adoption of new curriculum at the same time which afforded them not only new, more flexible furniture, but also added whiteboards for students to use for a student-centered, inquiry-based curriculum.

Under the subcategory of spatial layout, the lowest rated subcategory for the content area of math at Longfellow, the greatest area identified for improvement was that of

access to small (average score of 1.56) and large group (average score of 1.41) collaboration spaces. The elements identified as strengths of these instructional spaces under this subcategory include adequate space for delivery of effective instructional practices and technology adaptability, both with an average score of 2.62.



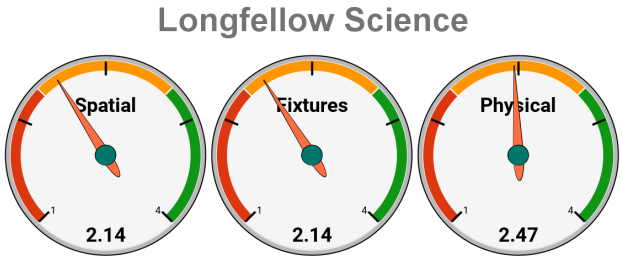
Science. Similar to math and English, concerns emerged regarding access to small and large adjacent collaborative spaces with average scores of 2.05 and 1.59, respectively. Closely following these scores were identified concerns related to personal space (average score of 2.11), circulation access (average score of 2.07) and access to storage (average score of 2.16). Comments associated with these ratings make note that the large tables in some spaces make it challenging to circulate effectively through the space. Also, where present, lab sites are on the periphery of the space making observation of student work for the sake of monitoring student safety as well as providing real time feedback is challenging.



Under the subcategory of fixtures, the element that received the highest score was instructional preparation area with an average score of 2.39. The lowest score was fixtures and equipment with an average score of 1.66. Comments made by facility evaluators regarding fixtures and equipment identify the following items as fully lacking or present with limited access, all of which is problematic in supporting science instruction:

- sinks;
- chemical hoods;
- eye wash stations;
- safety showers;
- lab stations;
- chemical storage; and
- gas lines.

The subcategory of physical attributes, natural daylight was identified as the greatest asset with an average score of 3.5. The greatest areas of concern were in the areas of adequate power (average score of 1.91), fixed features (average score of 2.25), and acoustics (average score of 2.27). Similar to English, due to the lack of adequate power sources, extension cords running through science rooms is not uncommon causing tripping hazards. In regards to fixed features, lab stations are either missing or situated along the periphery which, as noted above, are problematic in supporting students while they are engaged in labs. Finally, as noted with the English spaces, the acoustics are also problematic in supporting instruction. Not only was the HVAC noted to be loud, but also it was commented that the rooms are echoey. Multiple assessors shared that in some classrooms it appeared that the teacher had to yell in order to be heard by the students.

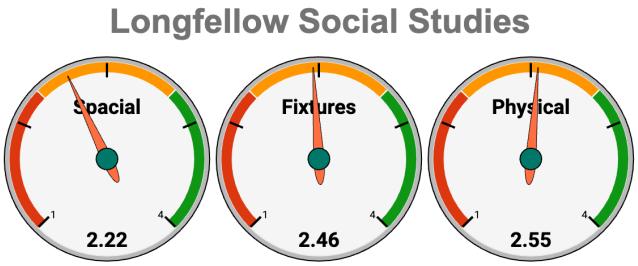


Social Studies. The evaluation of the social studies spaces possesses many similarities to other core content areas. The spatial layout of the instructional spaces that are currently used for social studies instruction was identified as the subcategory least supportive of desired instruction. Most problematic is access to large adjacent collaborative spaces (average score of 1.36). While circulation access was relatively low under English, it emerged as the second lowest rated element for social studies (average score of 2.09). Comments related to circulation access mention that students that use physical supports (e.g. crutches, wheelchairs) have a difficult time navigating throughout the space without running into backpacks and cords. Other comments mention that the spaces are tight, which is compounded when the space is to accommodate more physically developed adolescents, such as eighth graders. Technology adaptability was identified as this subcategory's strength with an average score of 2.75.

Under the subcategory of furniture, fixtures, and equipment, moveable furniture was identified as the greatest need to better support instruction with an average score of 2.29. This is similar to what was identified for English. Related comments make note

that more flexible furniture may also support greater circulation access. Conversely, wall-board space for displaying instructional resources and materials was identified as the greatest asset with an average score of 2.71.

Finally, physical attributes identify adequate power as the greatest area for improvement (average score of 1.96) as well as acoustics (average score of 2.18). The greatest strength identified is access to natural daylight (average score of 3.64). This mirrors what was identified for English and science. Similarly, concerns related to adequate power and acoustics were shared in the comments collected from assessors.



Elective Offerings

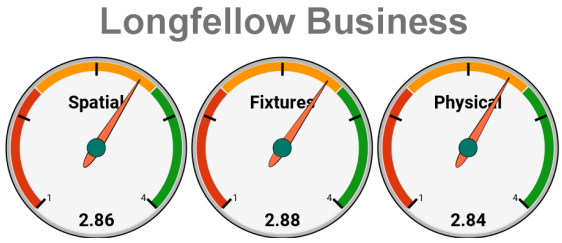
Business. Not unlike the high schools, the space that supports business education at Longfellow Middle School was also **rated the highest of all of the content areas with an overall average score of 2.86**. Additionally, like Wauwatosa West, the rating is reflective of one singular classroom - room 222.

In regards to spatial layout, the instructional spaces that serve business instruction are by and large identified as “sufficient”. The only ratings under a 3 were that of access to adjacent small group collaboration spaces (average rating of 2.57) and access to adjacent large group collaboration spaces (average score of 2).

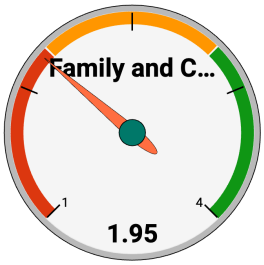
Under fixtures, all element ratings were at or above a 3 rating with the exception of moveable furniture which had an average score of 2.14.

As it pertains to physical attributes, access to natural daylight was the highest rated element with an average score of 3.71. The lowest rated element was that of overall aesthetics with an average rating of 2.29. Comments associated with overall

aesthetics note that there is a lot of maintenance needed in regards to blinds for the windows and ceiling tiles.



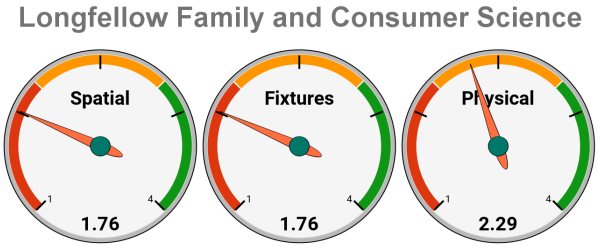
Family and Consumer Science. While further in this report performing arts - theatre will be discussed as the lowest scoring content area, no current, daily curriculum exists to support this content area. Therefore, it should be noted that the **lowest rated content area that supports daily student instruction is family and consumer science with an average overall score of 1.95**.



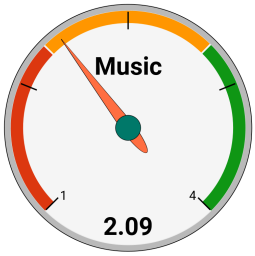
Culinary arts is a popular program, but the current space is undersized and woefully outdated. To best support this program, a larger space is needed that offers flexibility and additional capacity to meet the student demand. The greatest strength of the current space is related to its physical attributes. Contributing to the average overall score of 2.29 is access to natural daylight with an average score of 3.43. Further contributing to physical attributes is the greatest area of concern being site lines with an average score of 1.63. Unfortunately, no additional commentary was provided by assessors to qualify the rating.

In regards to spatial layout, the family and consumer science space is wildly lagging. All of the elements received an average rating under 2, representing that elements are mostly “partially or minimally” present. One’s ability to fluidly move about the space is impossible. The only two elements that received an average rating above 2 were shared space (average score of 2) and technological adaptability (average score of 2.29).

Furniture, fixtures, and equipment, received the same average score as spatial layout with an average score of 1.76. All elements received an average score of less than 2 with the exception of moveable furniture (average score of 2.14) and wall-board for displaying instructional materials (average score of 2).



Performing Arts - Music. The music spaces at Longfellow Middle School **scored the second lowest for a content area that supports daily instruction** behind family and consumer science with an average overall score of 2.09. In general, the music suite consists of three separate classroom spaces. The band/orchestra room is somewhat undersized for the programming it supports. The room has risers which limit flexibility and does not meet current accessibility standards.



Physical attributes was the subcategory that scored the highest with an average overall score of 2.27. The greatest strength identified was access to natural daylight (average score of 3.36). The greatest area of concern was overall aesthetics (average score of 1.77). Comments related to overall aesthetics share the following:

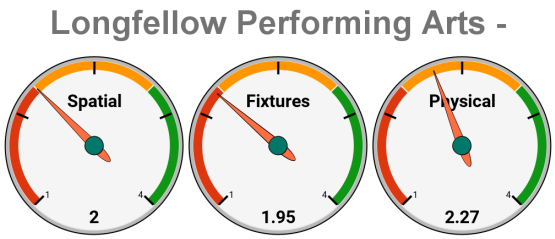
- Often tiles fall from the ceiling;
- Carpet frequently comes up off the floor;
- A fresh coat of paint would be helpful (remaining marks of a once mounted stereo speakers is evident);
- The space looks worn and tired;
- Blinds are broken;
- Plaster and paint are chipping and bubbling off the walls; and
- Cracks are visible in the walls.

The subcategory scoring the lowest is fixtures. Moveable furniture (average score of 2.18) and instructional preparation area (average score of 2.05) are the only two elements to score above a 2. Frequently noted in the comments elevate the problematic raised flooring in the band/orchestra room which impedes the ability to have moveable furniture, flexibility in furniture arrangement, and serves as a fixed feature barrier.

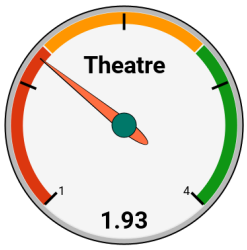
Spatial layout was identified as the subcategory in the middle of fixtures and physical attributes. The element receiving the lowest rating in this subcategory is circulation access (average score of 1.77). This is largely due to the raised flooring in the band/orchestra room. Educators shared the following in regards to the barriers related to spatial layout:

- Removing the raised flooring would allow educators to “flip” the classroom and provide flexibility in where the educator is situated during large group instruction as well as provide wall space for visual aides and technology;
- Removing the raised flooring would allow for rehearsal in the round;
- Removing the raised flooring would allow for small group instruction;

- Removing the raised flooring would allow for the instructors to travel freely within the space to observe student performance and provide real-time feedback; and
- As previously stated, the overall size of the band/orchestra room is not supportive of the large ensembles that the space is charged to support



Performing Arts - Theatre. The theatre space at Longfellow Middle School was identified as the **lowest scoring space with an overall average rating of 1.93.** Despite the fact that there is no daily theatre instruction, the theatre space is called upon often to support school-based events. The seating capacity is 421. Unfortunately, the space does not have areas designed to provide wheelchair accessibility. Overall, the seating is 15-20 years old and in relatively good condition.

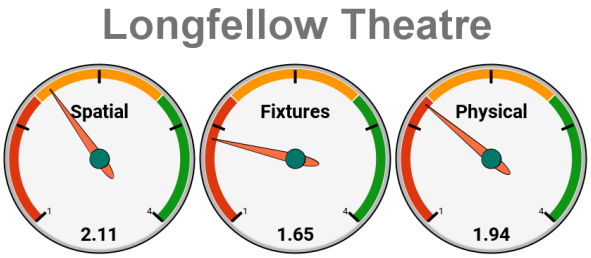


The long-range facilities plan drafted in 2024 identifies the following:

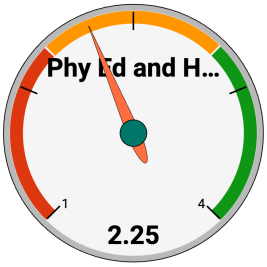
- The stage light controller, spotlights, and the light system board are 45-50 years old, obsolete, and need replacement. The light booth control is 10 years old and in good condition.
- One of the two sound systems is obsolete and needs replacement.
- Stage curtains range in age from six to 18 years old, and are in good condition.
- There are two dressing rooms and both are in good condition. The girls' dressing room is 181 sq ft and the boys' dressing room is 195 sq ft. There are two associated restrooms.
- There are two rooms that provide adequate storage. One room is located on the 3rd floor, used to store props, and has an area of 410 sq ft. The second storage is located in the recreation room, used for costumes, and has an area of 465 sq ft. Lighting is original and should be updated to LED.
- There is a 493 sq. ft. workshop space in the back of the stage. The room has a working table, a miter saw, and two cabinets for tools. The lighting is original and should be updated to LED.

- Theatre ceiling tiles need to be replaced and the lighting needs to be upgraded to LED lights. The original stage floor is in bad condition. For now, the stage floor is covered with masonry boards as a temporary fix.
- The venue lacks a direct, ADA accessible route to the stage.

Longfellow has another theatre called "The Little Theatre." It contains 60 seats, which are 15 to 20 years old but in good condition. The stage floor is in good condition, but the theatre needs a new carpet on the house side and new lighting for both the stage and the house sides.



Physical Education and Health. Similar to the high schools, the physical education curriculum in the Wauwatosa School District is privileged to offer aquatics instruction at Longfellow Middle School due to the presence of the swimming pool. However, following a 2016 professional pool evaluation and a 2024 professional evaluation of the pool, the 70 year old pool needed to be shut down due to significant safety concerns. Significant repairs requiring significant capital investment are necessary to make the pool safe and operational. As a result, not only has this part of the physical education curriculum been suspended for students at Longfellow, but also the shutdown has impacted community-based activities arranged through the recreation department.

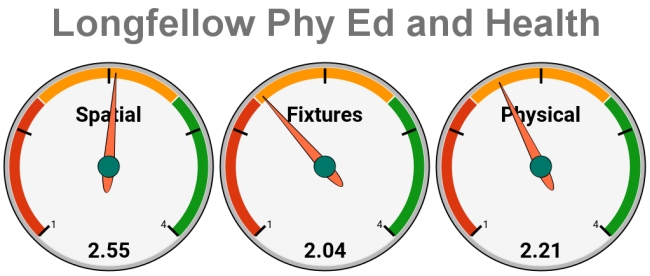


The spatial layout was identified as the greatest strength of the physical education and health spaces at Longfellow Middle School with an overall average score of 2.55. The greatest contributing factors to this score include personal space (average score of 3.12), shared space (average score of 3), and circulation access (average score of 3). The most hindering elements include technology adaptability (average score of 1.53) and access to adjacent small group collaboration space (average score of 1.82).

Physical attributes was the second highest subcategory. Adequate power (average score of 1.94) and overall aesthetics (average score of 2) were the lowest rated

elements while site lines were identified as the greatest strength (average score of 2.59). General comments note that the spaces appear to be worn and dated.

The lowest rated subcategory is fixtures. Space for physical models/equipment was rated the highest with an average score of 2.53 while movable furniture (average score of 1.53) and wall-boards for displaying instructional materials (average score of 1.59) were rated the lowest. No comments were submitted to provide additional qualitative reasoning behind the ratings.



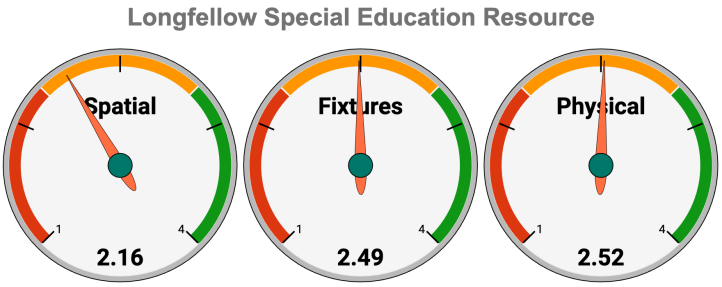
Special Education - Resource. Special education spaces are distributed around the building, including full size classrooms. The use of full size classrooms is workable only because the current capacity of the building is larger than the student enrollment.

Like the special education spaces noted above, as the service model has changed over the years, so has the need for number and type of spaces. Specialists are often working in rooms that are not designed to best support their work. Access to flexible learning spaces around the building is limited, necessitating meeting in places remote from a student's main classroom.

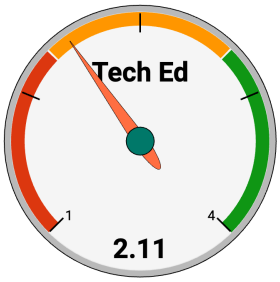
The greatest asset (natural daylight - average score of 3.36) and greatest area for improvement (site lines - average score of 1.86) were both identified within the physical attributes subcategory. The element that garnered the most comments was in relation to acoustics (average score of 2.29). As previously mentioned, the HVAC system is loud causing noise pollution in these instructional spaces. One school level respondent shared the following information in their comments, "The rooms have no sound proofing making it almost impossible to hear at times. For students with sensory sensitivity, these rooms are a nightmare. We need sound buffering boards or carpeting options to assist with baffling the sound".

Under furniture, fixtures, and equipment, moveable furniture and instructional preparation areas received the highest ratings (both had an average of 2.57). The lowest rated element was wall-board space for displaying instructional materials/resources (average score of 2.36).

In the spatial layout subcategory, storage received the highest average score (2.64) with access to adjacent small group and large group space receiving the lowest score (average rating for both - 1.64). As it pertains to personal space, shared space, and circulation access, evaluators noted that different, more flexible furniture would increase functionality of the space. One school level staff member shared, "The flexible seating options that we currently have do not work".



Technology Education/STEM. At the time of this study, dedicated science, technology, engineering, and mathematics (STEM) classrooms are present for sixth, seventh and eighth grades. Additionally, there is another dedicated instructional space for technology education classes that all students in grades six through eight can opt into.

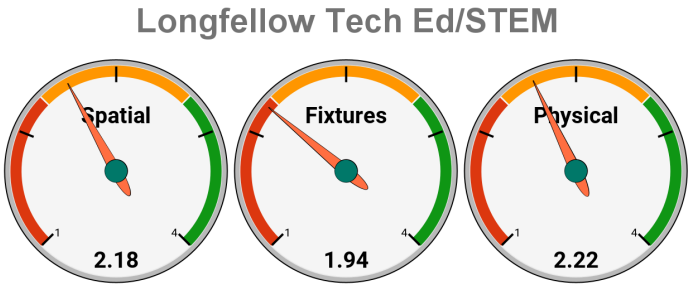


The lowest rated subcategory is related to furniture, fixtures, and equipment. The lowest rated element is fixtures/equipment (average rating of 1.65). To support strong, integrated learning of the STEM components it would be appropriate to expect certain fixtures and equipment to be present - for example fume hoods. Due to the limitations in the available fixtures/equipment, also limited are the experiences that students can be provided, safely. Space for physical models/other equipment received an average score of 1.67. Similarly, due to space limitations, equipment such as 3D printers and CNC machines, are not present in the immediate classrooms or not available at all. Again, this further limits the learning experiences that are afforded to students.

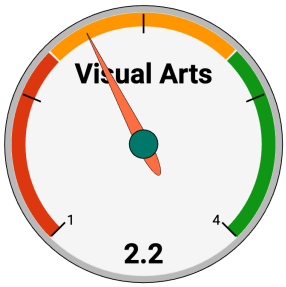
Within spatial layout, access to storage was identified as the lowest rated element (average score of 1.98). The lack of storage space compounds the previously identified barriers under furniture, fixtures, and equipment. Since there is an overall

lack of storage, free space is taken up by the equipment and materials that are present again impeding on the learning experiences that are afforded to students.

Ratings related to physical attributes fared the strongest with access to natural daylight receiving the highest rating (average score 2.9) and adequate power receiving the lowest rating (average score 1.85).

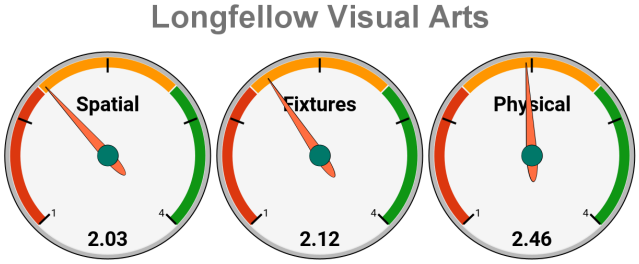


Visual Arts. Only one room currently operates in service of visual arts at Longfellow. The greatest asset identified is the space's access to natural daylight (3.86 average score) under the physical attributes subcategory. Adequate power was identified as the area for greatest improvement under the same subcategory (averages score of 2). Similar to other content areas, the HVAC system was identified to be a noise irritant (average score of 2.29).



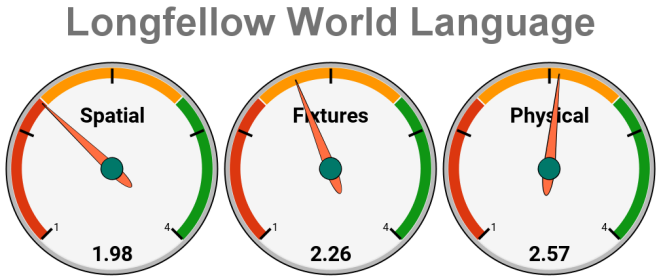
With an average subcategory score of 2.12, furniture, fixtures, and equipment was identified as the next highest. Within this subcategory fixtures/equipment was identified as the lowest rated element (average score of 1.86). It was noted that rolling whiteboards and a new sink would be supportive updates. While there is access to a kiln, it is located in a separate part of the building.

Under spatial layout, access to storage (average score 2.14) garnered the most comments by both school staff and the facility review team. It was noted that the main storage closet is not located within the classroom, therefore the teacher does not have ready access to materials throughout the day to support student learning. To retrieve the materials in real time requires the teacher to leave students unattended which is a safety concern.



World Language. In regards to supporting world language instruction, the physical attributes of the spaces were rated the highest (average score of 2.57). Similar to other content areas, access to natural daylight received the highest rating (average score of 3.67). Within this subcategory, the lowest rated element was adequate power (average score of 1.96). One school level evaluator shared, "Often there are more students that need plugs than outlets available". The next lowest rated element is related to acoustics (average score of 2.22). Comments related to this rating note the loud HVAC system. One school-level assessor shared, "During speaking activities at a reasonable volume, it is hard for students to hear each other even in close proximity".

Furniture, fixtures, and equipment received an overall average rating of 2.26. The element with the highest rating was that of wall-boards for displaying instructional materials/resources (average score of 2.52). This is important in a world language classroom to not only provide awareness of the cultures that use the language that students are learning, but also to be used as a supportive visual scaffold for students' language production and comprehension. Space for instructional equipment received the lowest rating of the subcategory (average score of 2.11). No comments were submitted for greater qualitative context for the rating. The element with the next lowest rating was flexibility in furniture arrangement (average score of 2.15). One school-based assessor shared, "There is no flexibility in furniture. I have worthless tables in my room".



In regards to spatial layout, access to small (1.56) and large (1.33) adjacent spaces received the lowest average ratings. The three elements that received the most comments, especially from school-based educators, were personal space (average score of 1.78), circulation access (average score of 1.85), and shared space (average score of 1.96). The fact that the space is filled with tables and chairs rather than individual desks poses a challenge for the educators in the space in regards to these three elements. One school-based educator stated, "I HATE having tables. The kids try to cheat all the time. I wish we still had individual desks so students have their own personal space". Another school-based educator shared, "With larger class sizes than core classes, we need to be moved to larger rooms. We do a lot of speaking

activities and our space makes it hard to move and gets very loud even at a normal volume". As it pertains specifically to circulation challenges, a school-based educator submitted the following, "Having backpacks laying all over the floor is a major issue. Students should not be bringing backpacks in the classroom. I was injured tripping over a backpack earlier in the year. Students can not move around the room because they are tripping over the backpacks. There is not enough space for tables, 30 kids, and backpacks". In summary, there is support from the school-based world language educators that assessed their instructional spaces for there to be more space and different furniture to support world language instruction.

Overall Building - Common Spaces

Appendix AC outlines the assessed scores for the common spaces at Longfellow Middle School. Of the four secondary schools, the common spaces at Longfellow were rated the highest with an average score of 2.53. Next was that of East High School with an average overall rating of 2.47. **Of all of the common spaces evaluated at all four secondary schools, Longfellow's library/media center was the only common space to score a "sufficient" rating with an average score of 3.13.**

With the library/media space identified as the only "sufficient" space, the following three elements were identified to be the elements of greatest concern.

Access to staff restrooms and bottle fillers within the same wing/quadrant as one's primary work space received the lowest rating with an average score of 1.87. Commenters reported that there is limited access to these two fixtures. Staff restrooms are fixed to the main office (located on the second level) and the teacher's lounge (located on the first level) which was noted as having narrow stalls.

Space to support Special Education was identified as the second greatest area of concern with an average score of 2.07. Qualitative data collected from building level staff share the greatest barrier as navigating shared spaces, especially for testing and small group instruction. Additionally, it was shared that spaces designated for special education services are not always clearly defined and subsequently shared appropriately. One school-based evaluator shared the following suggestion, "We need either a central CMC (Content Mastery Center) which can accommodate drop ins and is staffed all day, or each team member requires a space to accommodate the number of students on their caseload for assessments. A CMC would need to be a separate location from where we would provide specially designed instruction as these spaces have to be flexible to accommodate varying group sizes and needs".

Clearly marked and secure main entrance was identified as the third greatest area of concern with an average score of 2.33. As identified in the long-range facilities report, the main office has been recently renovated and is generally appropriately sized. Additionally, the same report communicates that the main entrance does present a secure entry; however, the front desk staff does not have a clear line of sight to visitors approaching the building. Reliance on cameras is necessary. Reconfiguration to allow for a secure transaction window that would not require visitors to enter the building should be considered. Assessors, including school-based educators, commented as a part of the *Analysis of Learning Spaces* study that visitors are often confused about where to enter the building. Additional comments highlighted that where the parking is orientated (on the side and back of the building) is not conducive to the main entrance which is situated on North Avenue. Visitors that utilize the parking lots need to travel some distance to access the main entrance. There is limited street parking on North Avenue which is the closest to the main entrance.

Below are a few other key notes as it relates to common learning spaces at Longfellow Middle School. As reflected in the low rating under community-building spaces (average score of 2.4), Longfellow lacks a space for all educators to comfortably gather and engage in professional learning with one another. This is mission critical to ensuring that a strong professional culture, anchored in academic excellence, is cultivated. Additionally, comments were elevated under administrative services and counseling services that private conversations can be heard through the walls and doors, compromising confidentiality. Furthermore, under these two elements, it was further noted that there are not enough conference rooms to accommodate the number of meetings that occur with staff, students, and families.

Longfellow Findings Summary Analysis

At present, the greatest asset that supports a strong learning environment is the access to natural daylight. By and large, most of the instructional spaces have direct access to daylight. This is supportive for staff and student mental health, especially during winters in Wisconsin, so that there can be increased time and attention on learning.

When considering the elements that make up the subcategories of spatial layout, furniture, fixtures, and equipment, and physical attributes there were three elements that **fell below the 2 designation of "partially or minimally present". Access to adjacent small (overall average score of 1.89) and large (overall average score of 1.73) collaboration spaces were two of the three elements identified. The third**

was adequate power (average score of 1.99). The long-range facility study does note that the overall organization is good and it could be enhanced by additional connectivity between rooms and breakout spaces. In regards to common spaces, the school is largely inaccessible and confusing to visitors.

Finally, while the quantitative analysis elevated the aforementioned elements as areas of critical concern, the qualitative analysis of evaluator comments shines a light on the acoustics of the learning spaces at Longfellow. **In 75% of the spaces, noise pollution from the HVAC system or noise pollution from other classrooms was identified contributing to difficulty in communication between teacher to student, student to teacher, and student to student during instructional time**. While instruction does not take place in the cafeteria, it is very challenging to hear anything in the cafeteria, especially when there are over 200 students in the space at one time. The other element that emerged out of the qualitative data is that of the furniture in the school. With the 2018 referendum some furniture was updated; however, there remain a large portion of the learning spaces that are functioning with inflexible furniture. When this is coupled with fixed features in the learning space, furniture arrangements at times can be limiting.

In short, the learning spaces at Longfellow Middle School do not support the desired learning environment for students of the 2020s and beyond. In general, the school is currently uninspiring and needs significant improvements.

Whitman Middle School

Whitman Middle School, located at 11100 W. Center Street was constructed in 1959, serving originally as West High School until 1967. A pool was added in the 1960s. It is the second youngest secondary school in the Wauwatosa School District. The site is bounded by Center Street on the south, the highway to the west, retail buildings to the north, and a railroad line to the east. The school, with the playfields to the north and west, occupies the majority of a two block area (21.5 acres).

Today it is 141,174 square feet serving grades 6 - 8. In regards to the functional school capacities calculation, Whitman Middle School passes all three methods: (1) capacity by desired class size, (2) capacity by learning, and (3) capacity based on gross building area (Wauwatosa School District Long-Range Facilities Plan, May 2024, p. 104). However, the calculation for capacity based on gross building area came in equalling that of the school's current enrollment. This is an indication that building support spaces may not be properly sized to serve an increase in student enrollment.

In the assessment of all four secondary schools, Whitman Middle School was identified as the **least healthy facility** when it comes to supporting the desired instructional state with its overall average score of 2.23 out of 4.

Core Content Areas

English. The English spaces at Whitman emerged as the lowest rated core content area with an average overall score of 2.19. Within this content area, furniture, fixtures, and equipment was identified as the most supportive subcategory with an overall average rating of 2.36. Serving as the greatest asset is wall-boards for displaying instructional materials/resources with an average score of 2.77. Rated second highest was that of moveable furniture with an average score of 2.5. One school-based assessor shared, "Student furniture is mostly moveable, but it does not reconfigure easily". Presenting challenges to the English instructional spaces under this subcategory rests predominantly under instructional preparation area (average score of 2.05) and space for instructional equipment (average score of 2.16). As it pertains to teachers' instructional preparation areas, one school-based assessor commented the following, "I have a teacher corner, but I do not work at it because it is so cramped. I have too many things that have no permanent home, so I opt to work at student desks away from my space". Regarding space for instructional equipment, one school-based evaluator shared, "If I added anymore furniture, I think the room would burst. I can't add anything in, permanently or semipermanently". These two elements speak to the additional concerns that emerged under the subcategory of spatial layout.

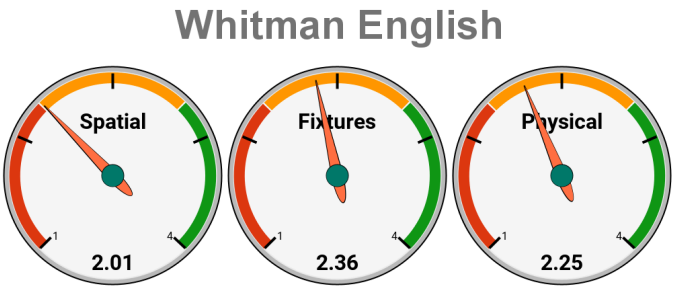
Spatial layout was identified as the subcategory in greatest need of improvement (overall average score of 2.01). Half of the elements under this subcategory scored below a 2 rating of "Partially or Minimally Present". Those elements were:

- Access to adjacent small group collaboration spaces (average score of 1.2);
- Access to adjacent large group collaboration spaces (average score of 1.34);
- Access to storage (average score of 1.88); and
- Shared space (average score of 1.96).

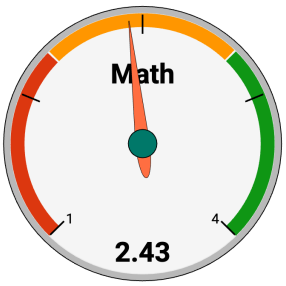
The next lowest score was associated with circulation access with an average score of 2.13. From an instructional perspective, comments associated with this rating are the most troubling. The following comment from a school-based evaluator captures this concern succinctly, "I cannot move around the room easily based on the number of students and size of furniture in the room. Additionally, despite the amount of chairs and tables, I have no space to pull students for small group work". **In short, this educator is communicating that they know what best practice is; however, they are unable to meet this minimal standard due to the number of students they**

are required to serve in the size of the classroom that exists. Within this subcategory, technology adaptability is the highest rated with an average score of 2.64. Preventing a more proficient score is the size of the main projection boards and educators' knowledge of how to use the technology wirelessly.

Physical attributes was the subcategory scoring in the middle with an average score of 2.25. Adequate power (average score of 1.91) and thermal comfort (average score of 1.95) scored the lowest with access to natural daylight (average score of 2.63) and site lines (average score of 2.59) rating the highest. In regards to adequate power, comments elevate the fact that power cords are everywhere for student access to power to keep Chromebooks charged. The presence of power cords does present tripping hazards in an already small, crowded space. As it pertains to thermal comfort, it was noted that many of the rooms presented as humid and muggy with no ability for staff to manage the temperature individually. One school-based evaluator noted that their room is "moist and the smell of mildew can fill the room if I don't open windows to air it out". Fans were also noted to be running which further contributes to any noise pollution in the classrooms. Regarding natural daylight, not all of the classrooms that support English at Whitman have windows, but many do. One school-based evaluator shared, "The sunlight is the best feature of my room!". While it did not emerge as a top concern quantitatively, qualitatively the element that received the most attention was acoustics. Comments submitted note that neighboring classes can be heard which impedes on the instruction taking place inside the classroom. This is compounded in the classrooms that have semi-permanent walls that are connected to another classroom. Additionally, loud ventilation and fans were also identified as contributing factors to noise pollution. Noise coming from the hallway was also captured as an impediment to instruction within the classroom. These distractions are not conducive to ensuring that students have a supportive learning environment.



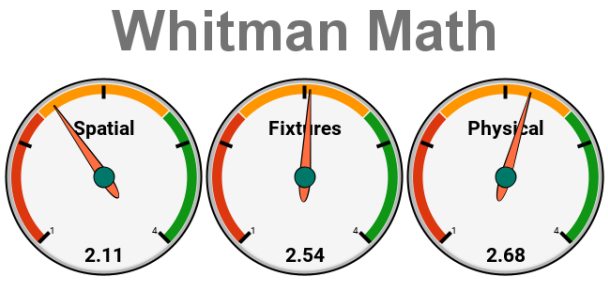
Mathematics. Math is the highest rated core content area in the application of the *Analysis of Learning Spaces* rubric with an average overall score of 2.43. Physical attributes were identified as the greatest asset of the math classrooms at Whitman. Under this subcategory the two elements that were rated the highest were access to natural daylight with an average score of 3.36 and adequate light/dark control with an average score of 3.14. The area of greatest concern under this subcategory is adequate power (average score of 2.24). Comments submitted related to this element are similar to what was elevated under English in that extension cords are ever present for students to charge their Chromebooks. Thermal comfort was elevated as the second greatest area of concern with an average rating of 2.31. Contributing to this rating is the fact that there is no independent control of the temperature inside of the classroom causing the space to either be too warm or too cold. Similar to English, the element that received the greatest qualitative attention was acoustics with an average rating of 2.37. Many of the math spaces experience noise pollution from neighboring classrooms which is exacerbated when the classroom shares a semi-permanent wall with a neighboring classroom. Hallway noise also infiltrates the classroom space. Fan noise was also captured as a contributing factor to poor acoustics. In short, these are concerning distractions that students at Whitman need to negotiate daily in order to fully engage in their learning.



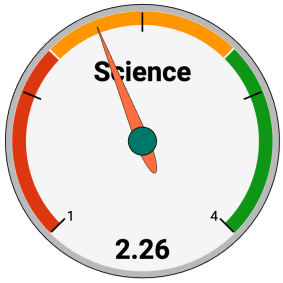
Furniture, fixtures, and equipment was identified as the second most supportive subcategory with an average overall score of 2.54. Rating the highest was wall-boards for displaying instructional materials/resources with an average score of 2.92. Despite the highest rating within the subcategory, one school-based evaluator left the following comment, “The glass boards are hard to write on and can only use tape (leaves marks then). There are no bulletin boards to display student work at all. I like the large magnetic white board wall for students, but I wish I had a large bulletin board for displaying student work and better boards than the glass ones in the front of the room. Those are terrible”. Instructional preparation areas received the lowest rating with an average score of 2.36. Unfortunately, no comments were submitted to better understand the quantitative rating. The second least favorable rating was for space for physical models/other equipment with an average rating of 2.37. In relation to this rating, one school-based assessor shared, “There is no space for student physical models or work to be held. I have cabinets for teacher things, but that is where it ends”.

Spatial layout was identified as the subcategory of greatest concern within the math classrooms with an average score of 2.11. Lack of access to adjacent small group collaboration spaces (average score of 1.19) and adjacent large group collaboration

spaces (average score of 1.44) emerged as the areas of greatest improvements. Shared space (average score of 2) and circulation access (average score of 2.32) were also identified as elements of concern. Relative comments note that different furniture may assist in creating more shared space and afford better circulation. However, when classes have more than 24 students any shifts in furniture in the current spaces may not remedy this concern. The most supportive element of this subcategory was identified as that adequate space for delivery of effective instructional practices exists (average score of 2.63).



Science. The science spaces at Whitman Middle School saw an overall rating of 2.26 out of 4 against the *Analysis of Learning Spaces* rubric. The subcategory of physical attributes materialized as the strongest of the three subcategories with an average overall score of 2.58. Access to natural daylight (average score of 3.26) and adequate light/dark control (average score of 2.85) surfaced as the most supportive elements within this subcategory. As it pertains to the elements of greatest concern, adequate power (average score of 2.2), thermal comfort (average score of 2.31) and fixed features (average score of 2.39) were identified. Under adequate power, no comments were submitted to support further context. In regards to thermal comfort, submitted comments note that there is an inability to control the temperature from within the classroom in many spaces. Finally, related comments to fixed features being located in a way for educators to see all instructional activities was highlighted as a challenge mostly due to lab spaces being situated on the classroom periphery. When lab spaces are placed in this way, students huddle around the lab station and all that a teacher can see are students' backs which presents not only an educational concern (the inability to provide students with real-time feedback), but also there is a safety concern in not being able to see what students are doing.

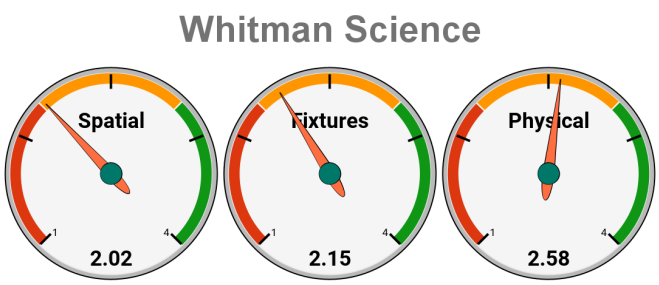


The second highest rated subcategory was furniture, fixtures, and equipment with an average overall rating of 2.15. Instructional preparation area was identified as the

greatest asset of this subcategory (average score of 2.33). In the comments, some spaces had added notes stating that there were no instructional spaces for labs. Additionally, one school-based evaluator shared, “We use the storage area to set up. It would be nice to have a dedicated area for planning”.

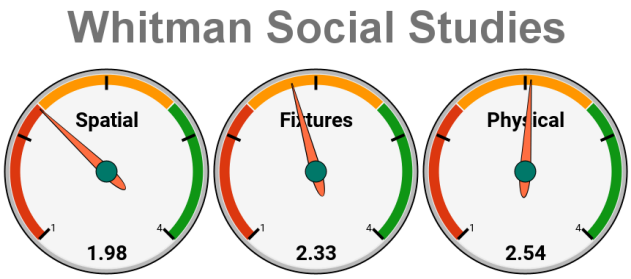
Flexibility in furniture arrangement (average score of 1.98) and fixtures/equipment (average score of 2.04) were the elements under the subcategory of furniture, fixtures, and equipment with the greatest need of improvement. Comments submitted related to flexibility in furniture indicate that some of the spaces are too small to accommodate flexibility and that lab tables do not allow for flexibility. **In short, the classroom size is undersized for science**. Related to fixtures/equipment, basic science fixtures are missing such as fume hoods, eye wash stations, gas lines, and first aid kits. As previously mentioned, lab space against the walls does not allow students to collaborate with one another at all angles.

The subcategory in greatest need of improvement is spatial layout (average score of 2.02). Technological adaptability was identified as the greatest asset under this subcategory with an average score of 2.61. The greatest criticism is that the large display boards are undersized for the space making it potentially challenging for students to see what is being displayed with ease, especially from further away. Similar to other content areas, access to adjacent small group collaboration space (average score 1.46) and adjacent large group collaboration space (average score of 1.17) emerged with the lowest ratings. Shared space and circulation access were both rated at an average of 1.93 when the *Analysis of Learning Spaces* rubric was applied. Regarding shared space, one school-based evaluator shared, “There is no where to send students”. Different furniture may assist in creating more space; however, lab space–where it exists–is still chained to the periphery. Regarding circulation access, one school-based evaluator articulated the challenge by stating that there needs to be either “more space or less students”. It was noted that different furniture may be able to assist in remedying the challenge; however, the spaces remain small for the number of students accessing the space. When educators are unable to monitor student thinking successfully, students miss out on opportunities for real-time feedback to feed their learning forward. This is a significant concern given the pursuit to improve student learning outcomes at Whitman Middle School.



Social Studies. The instructional spaces that currently support social studies saw an overall average rating of 2.28 with physical attributes as the strongest subcategory with an average score of 2.54. Access to natural daylight emerged with the strongest score of an average of 3.75. The second highest score was associated with site lines which had an average score of 2.82 indicating that most classrooms are relatively well structured for visibility to the hallway/room approach area from the doorway to the classroom as well as from within the classroom itself. Of the greatest challenge under this subcategory is adequate power (average score of 1.95) and acoustics (average score of 2.16). Comments submitted around adequate power did not provide significant insight into the numerical rating; however, much commentary was shared regarding acoustics. Similar to other content areas at Whitman, noise from neighboring classrooms infiltrate the classrooms. This is particularly amplified when a semi-permanent wall is present in a classroom. Additionally, comments associated with loud fans were also recorded. The constant distractions impede students ability to fully engage and concentrate on the learning taking place inside the classroom. For the developmental age of middle schoolers, this can be more problematic than students at other ages.

Furniture, fixtures, and equipment was the next most supportive subcategory with an average score of 2.33. Wall-boards for displaying instructional materials/resources emerged with a score of 2.66. Comments elevate a desire for more whiteboard space to be included. The element for greatest improvement is space for instructional equipment. Comments note that rooms are undersized to support this, including a lack of storage space.



Spatial layout received the lowest rating with an overall average score of 1.98. Adequate space for delivery of effective instructional practices (average score of 2.45) and technological adaptability (average score of 2.61) were identified as the greatest assets. Comments submitted around adequate space for delivery of effective instruction note that some of the social studies spaces are small impeding on this

opportunity. Related to technological adaptability, comments note that the large display boards present are undersized for the space potentially impeding students' ability to see properly, especially from far away. The following elements all score less than an average of 2 "Partially or Minimally Present":

- Shared space (average score of 1.93);
- Circulation access (average score of 1.98);
- Access to storage (average score of 1.86);
- Access to adjacent small group collaboration space (average score of 1.14); and
- Access to adjacent large group collaboration space (average score of 1.66).

Room size was the underpinning comment related to the scores for shared space, circulation access, and storage. It was noted that different furniture may assist in creating more space. When there is a lack of storage, educators are reluctant to explore how manipulatives may support student learning. Also, as previously noted, when there are barriers to circulation access students miss out on much needed real-time feedback on their learning. When this is not afforded to them, their learning opportunities are not maximized.

Elective Offerings

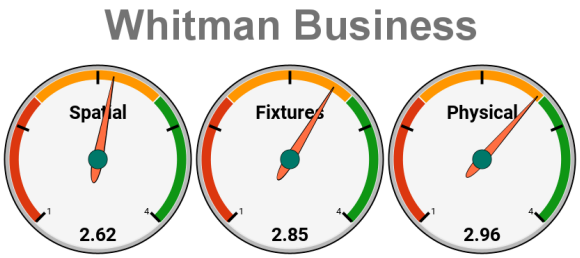
Business. Similar to the high schools and Longfellow, the space that supports business education at Whitman Middle School was also **rated the highest of all of the content areas with an overall average score of 2.8**. Additionally, similar to West and Longfellow, the rating of the business instructional space is reflective of only one classroom - room 109.

The strongest subcategory for this content area was physical attributes with an average score of 2.96. Access to natural daylight was identified as the greatest asset with an average score of 3.75. Overall aesthetics was identified as the element in greatest need of improvement with an average rating of 2.38. Comments aligned to this element highlight that the lights are considerably past their lifespan as well as the ceiling tiles which have holes and are peeling.

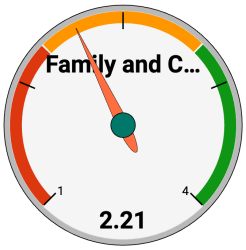
Furniture, fixtures, and equipment was identified as the next most supportive subcategory with an average rating of 2.85. Of the five rated elements within this subcategory, the only two that emerged below an average 3 "Sufficient" rating was flexibility in furniture arrangement (average score of 2.43) and instructional preparation area (average score of 2.71). Related comments to flexibility in furniture arrangement elevate that the floor outlets that are present limit arrangement

options and flexibility. No additional comments were supplied to explain the less than sufficient rating for instructional preparation area.

Spatial layout emerged as the least supportive subcategory with an average score of 2.62. Of the nine elements rated under this subcategory, four received less than a 3 "Sufficient" rating. Similar to other content areas, access to adjacent small group collaboration space (average rating of 1.25) and adjacent large group collaboration space (average score 2.14) are largely absent. Access to storage received an average score of 2.71. No related comments were submitted to provide further context. Shared space emerged with an average rating of 2.25. Raised power banks were identified as barriers to establishing such a space in the room. Comments further noted that different furniture might be able to support greater flexibility in the space.



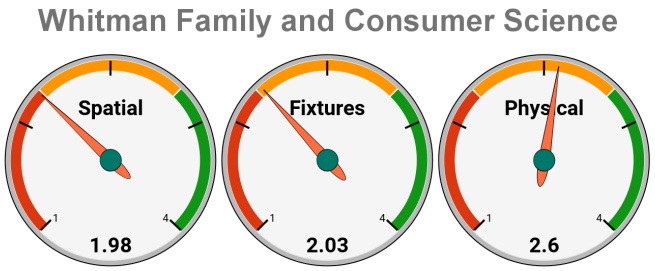
Family and Consumer Science. Similar to business, the ratings for family and consumer science at Whitman Middle School is reflective of one classroom - room 3. This space saw an overall average rating of 2.21. Physical attributes emerged as the strongest subcategory with an average score of 2.6. The most supportive element was identified as natural daylight with an average score of 3.71. Adequate power was identified as the element in greatest need of improvement with an average score of 2.14. A school-based assessor commented, "Often during cooking labs the east side of my classroom lab stations lose power and the custodian needs to come flip a switch". Site lines and overall aesthetics received the second lowest rating with an average score of 2.38. A school-based evaluator shared the following regarding site lines, "I have ZERO sight lines into my room. I would appreciate a mirror located outside my room to let me see 1) kids in the hallway messing around 2) people coming toward my classroom 3) intruder or unsafe situation that I can respond to ASAP 4) any other pertinent needs occurring in the hallway that I can respond to to help promote safety!". In regards to overall aesthetics, submitted comments share that the space is outdated.



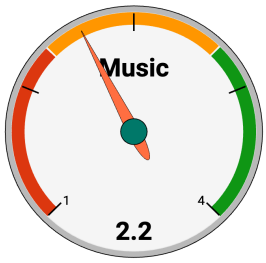
The second highest rated subcategory was furniture, fixtures, and equipment with an average overall rating of 2.03. Instructional preparation area and space for physical

models both surfaced as the greatest assets under this subcategory with an average rating 2.29. Comments related to both elements simply state that more space is needed. The element in greatest need of improvement under this subcategory is flexibility in furniture arrangement. Again, more space was identified as the ultimate need to be able to support different furniture arrangements.

Spatial layout was identified as the weakest subcategory with an average overall score of 1.98. Access to storage received the highest rating with an average score of 2.57. Related comments note that many of the storage cupboards, drawers, and cabinets are unusable as they are rusty, stained, broken, and/or bent. The elements rating the lowest were access to adjacent small and large group collaboration spaces, both with an average score of 1.29. Technology adaptability emerged as one of the lowest rated elements with an average rating of 1.86. A school-based evaluator noted, “The picture is less than acceptable when the sun is out and the conditions are too bright for effective viewing”. Additionally, circulation access was elevated as an area of grave concern with an average rating of 1.88. A school-based evaluator shared, “I have a difficult time navigating through the work tables to get to all areas of my class easily”. As highlighted in other content areas, not only is poor circulation access a safety concern, it is also a significant instructional concern. A teacher’s inability to reach the students easily does not allow for the critical part of the learning cycle where teachers provide real-time, actionable feedback to students.



Performing Arts - Music. The music spaces at Whitman Middle School received an overall average score of 2.2 when the *Analysis of Learning Spaces* rubric was applied. Physical attributes was identified as the least supportive subcategory with an average score of 2.14. Deemed the greatest asset under this subcategory was site lines with an average score of 2.48. Site lines are largely supportive in the music spaces with the exception of the band room which has two large support beams in the middle of the instructional space and there is no site into the hallway from the back of the classroom. Access to power for student Chromebooks and other instructional technology was found to be limited with an average score of 1.96. Only one of the classrooms has access to natural daylight (the band room - room 102), bringing down the overall average rating to the lowest of the subcategories with an average of 1.78. The greatest area of concern, while it did not ultimately emerge as the quantitative lowest, is that of overall aesthetics and thermal comfort - both with an average quantitative rating of 1.87. First and foremost, overall aesthetics. It should be noted that rooms 14 and 16 have seen flood damage which has caused water stains on the ceiling tiles and carpet tiles to peel. It has also been noted that the flooring under the carpet tiles is green. From a health and wellness perspective, there is concern that mold is growing due to the noted flooding which can have severe health impacts on staff and students. From an instructional standpoint, further flooding could potentially lead to damage to instruments thus impacting students' musicality development and access to appropriate instruments and their functionality. In regards to thermal comfort, school-based evaluators shared that the temperature and the humidity levels can fluctuate considerably throughout the year. From an instructing standpoint, unstable humidity levels can have a detrimental impact on the effectiveness of the instruments, additionally impacting students' musicality development and access to appropriate instruments and their functionality.



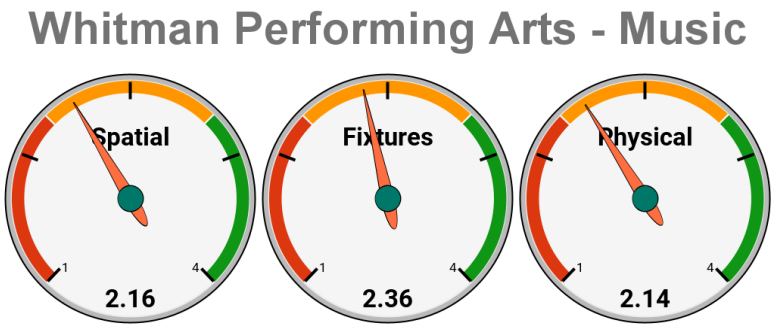
Spatial layout was the second strongest subcategory with an average score of 2.16 out of 4. Of the nine elements under this subcategory six of them scored under a 2.2 average score. A discussion of the six follows.

Shared space received an average score of 2.04. In general, the size of the music spaces are largely undersized for their purpose, thus leaving any additional space to be claimed as shared space largely missing. Also earning an average score of 2.04 was access to storage. The aforementioned flooding has impacted where and how equipment needs to be stored. As a result, the space is not able to be used as efficiently as possible. In general, the amount of storage space for the instruments that need to be stored is undersized.

Circulation access received an overall average score of 2.17. Again, the spaces are largely undersized for their purpose making circulation for staff and students challenging. One school-based evaluator shared, “I am constantly shifting chairs together past students as I move around the room”. Also receiving an average score of 2.17 is adequate space for programming. **In general, the spaces identified for music at Whitman are undersized from an instructional standpoint**. Additionally, as it currently stands, the spaces are at or above capacity.

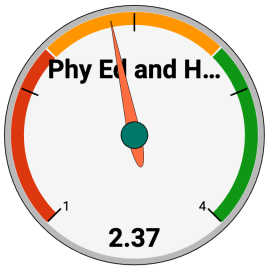
Receiving the lowest rating under this subcategory was access to adjacent small group and large group collaboration spaces - both with an average rating of 1.74. Comments submitted around these two elements underscore how the music program would benefit from having small group rehearsal areas for all music strands as well as a large space for multiple ensembles to rehearse/perform together.

Furniture, fixtures, and equipment was the subcategory that received the highest rating with an average score of 2.36. Moveable furniture was identified as the greatest asset (average score of 2.74). School-based evaluators elevated the need for more efficient violin and viola racks as current storage is bulky. Fixtures/equipment was identified as the least supportive element with an average rating of 2.09. School-based assessors noted that current storage is inefficient and presents obstacles in room layout. One school-based evaluator shared, “We are pushing the limits of our storage at the moment. I've gotten creative in ways to make some more room, but our shelves are filling up as are our sheet music storage shelves. We also don't have a designated storage area for additional chairs and stands. I've made due with what we have, but any more growth in the program might cause us to run out of space”. Additionally, there is a call for more vertical whiteboards.



Performing Arts - Theatre. Similar to Longfellow Middle School, there is no daily theatre instruction. However, unlike Longfellow Middle School, there is no existing theatre space at Whitman. Students who attend Wauwatosa Montessori combine talents with students from Whitman Middle School for extracurricular performances, which are typically held at Wauwatosa West High School. For this reason, theatre, overall and within each subcategory, scored a 1 for "Missing". Having once served as the westside high school, it is a-typical that a performance space does not exist.

Physical Education and Health. The physical education and health spaces at Whitman Middle School scored an overall average of 2.37 against the *Analysis of Learning Spaces* rubric. Spatial layout emerged as the subcategory of greatest support to instructional programming with an average rating of 2.55. Shared space received the highest rating with an average score of 3 while technology adaptability saw the lowest average score with 1.88 indicating that access to technology is largely missing or minimally present in these instructional spaces. No additional commentary was submitted.



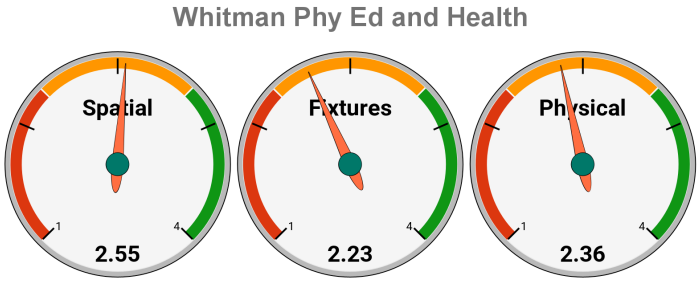
Physical attributes was identified as the second most supportive subcategory with an average rating of 2.36. Site lines emerged as the most supportive asset of the subcategory with an average rating of 2.71. Access to adequate power was elevated as the least supportive element with an average rating of 2.06. No additional commentary was submitted.

Finally, furniture, fixtures, and equipment was identified as the least supportive subcategory with an average rating of 2.23. Wall-boards for displaying instructional materials/resources was identified as the weakest element within the subcategory with an average rating of 1.71. Space for physical models/other equipment was identified as the strongest element within the subcategory with an average rating of 2.47. No additional commentary was submitted.

While it is not a state requirement, the physical education curriculum in the Wauwatosa School District is privileged to offer aquatics instruction at Whitman MIddle School due to the presence of the swimming pool. As communicated in the long-range facilities study, the pool at Whitman is in need of repair. What follows is what has been communicated in said study.

The pool was constructed in the 1960's, making the pool approximately 60 years old. A 2024 professional evaluation of the pool recommended a significant investment in

pool basin repairs and replacement of the cast iron piping system. Associated costs to address these recommendations are not yet identified in the District's capital improvement plan.



Special Education - Resource. Special education spaces are distributed around the building, some in full size classrooms. No specific sensory room is available. The seventh grade special education classroom is located in a space that used to serve as instrument repair and storage for the band room next door. Overall the spaces currently leveraged to support special education services at Whitman Middle School scored an overall average of 2.51 against the Analysis of Learning Spaces rubric.

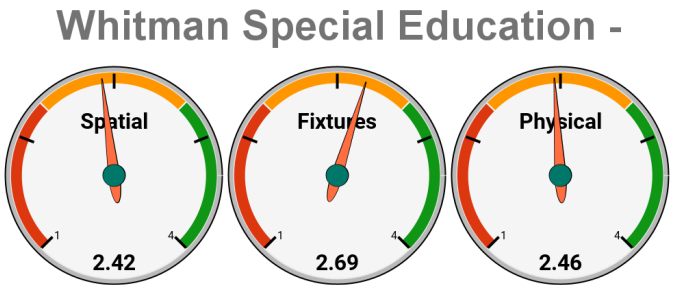
Furniture, fixtures, and equipment emerged as the most supportive subcategory with an overall average score of 2.69. Wall-boards for displaying instructional materials/resources was the highest rated element with an average score of 3. The following four elements were all identified as the areas most in need of improvement, all with an average score of 2.56: (1) moveable furniture, (2) flexibility in furniture, (3) instructional preparation area, and (4) space for instructional equipment. No additional commentary was submitted to support the quantitative ratings.

Under physical attributes, second highest rated subcategory, three of the eight elements earned 3 "Sufficient" ratings, those being:

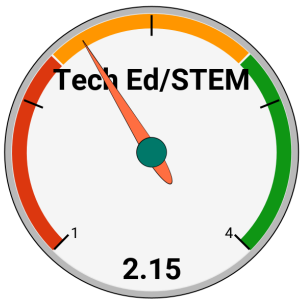
- Site lines (average score of 3.33);
- Adequate light/dark control (average score of 3.22); and
- Fixed features (average score of 3.22).

Adequate power access saw an average rating of 2 while overall aesthetics emerged with an overall score of 2.11. Comments associated with this element noted original lights and stained ceiling tiles. Access to natural daylight emerged with an average score of 1 as none of the resource rooms have windows or indirect access to daylight.

Spatial layout was identified as the least supportive subcategory with an average rating of 2.42. Personal space (average score of 3) was the highest rated element while access to adjacent small group and large group collaboration spaces were rated the lowest, average rating of 1.56 and 1.67 respectively. Qualitative comments submitted under this subcategory expressed concerns regarding wheelchair accessibility in certain resource classrooms as well as wheelchair accessibility in restrooms.



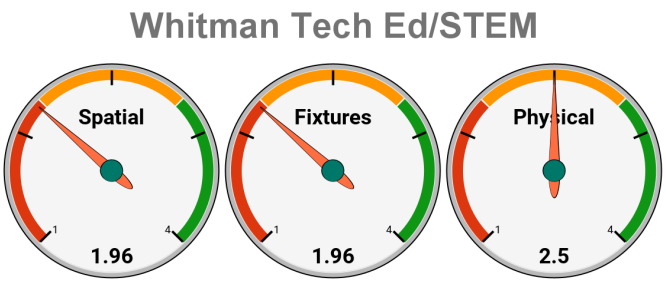
Technology Education/STEM. At the time of this study, dedicated science, technology, engineering, and mathematics (STEM) classrooms are present for sixth, seventh, and eighth grades. Additionally, there is another dedicated instructional space for technology education classes that all students in grades six through eight can opt into. As a whole, the technology education/STEM spaces at Whitman Middle School emerged with an overall average rating of 2.15. This is the third lowest rated content area at the school behind theatre (which does not exist, thus rated at a 1) and visual arts (average overall score of 2.12).



Physical attributes emerged as the strongest subcategory with an overall average score of 2.5. Access to natural daylight was the highest rated element with an average score of 3.73. Site lines was identified as the second greatest asset with an average rating of 2.85. The overall aesthetics of these instructional spaces was identified as in greatest need of improvement with an average rating of 1.92. One school-based evaluator shared the following, “The room is cramped and feels visually cold and dated. The desks and chairs are from more than 15 year ago and the teaching desk is designed with a typewriting bay. Aside from the white board and the smart board everything is dated”. Additional comments identified dirty lighting, water-damaged ceiling tiles, and no visibility of expected equipment to support STEM instruction. Fixed features (average rating of 2.04) and access to adequate power (average rating of 2.08) also saw the lowest ratings under this subcategory. Related to fixed features one school-based evaluator shared, “There are not enough fixed features that are seen in other lab rooms to expedite creation and clean up”. In regards to access to adequate power, notes were

submitted regarding the need for extension cords throughout the classrooms to support student access to power for their Chromebooks and other instructional aids and equipment.

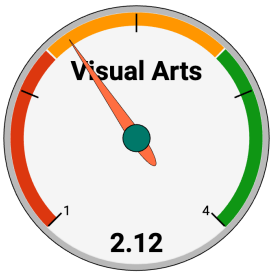
The subcategories of spatial layout and furniture, fixtures, and equipment emerged with the same overall average score of 1.96. Under spatial layout, access to adjacent small (average rating of 1.65) and large (average rating of 1.42) group collaboration spaces were rated the lowest. Comments submitted relative to these two elements note that the hallway is currently used for small group collaboration; however, this is often done unsupervised which presents a host of concerns not only in terms of monitoring student safety, but also educators' access to students to provide real-time feedback. It was noted that large group space is available by way of the lunch room; however, depending upon the time of day, it is off-limits. Adequate space for programming and adequate space for delivery of effective instructional practices also earned one of the lowest scores - both with an average rating of 1.85. Related comments noted that the spaces used for STEM instruction are largely undersized. Unlike at Longfellow, there is no large workroom or applicable shared space in the classroom to support student-centered instruction that leverages innovation, experimentation, and inquiry. Additional commentary noted that some of the STEM spaces were most supportive of lecture-style instruction and that students are often confined to their individual workspaces due to the lack of space. Personal space was identified as the greatest asset under the subcategory of spatial layout with an average rating of 2.63. This overall average rating is perhaps inflated. When the rating is disaggregated to account for the classroom that supports technology education space from the classrooms that support the STEM program, the technology education learning space emerges with an average rating of 3.66 while the STEM classrooms have an average rating of 1.75. No qualitative context was submitted for the technology education classroom; however, one school-based evaluator shared the following regarding the STEM classrooms, "Students have no choice but to be seated extremely close together often not being able to get in and out of their chairs comfortably. Tables are also small so that students' belongings crowd the area during work times".



Within the subcategory of furniture, fixtures, and equipment wall-boards for displaying instructional materials/resources was elevated as the strongest element with an average rating of 2.5. Related comments share that while there may be access, some whiteboard space is often inaccessible due to storage constraints and materials being stored in the open again said wallspace. Fixtures/equipment emerged as the weakest element with an average rating of 1.42. Access to more equipment, including sinks, is largely missing in the STEM classrooms. Space for physical models/other equipment was also rated low with an average rating of 1.73. It is noted in the comments that space for equipment such as 3D printers is largely absent from the STEM classrooms, but available in the technology education classroom. One school-based evaluator shared, “I don't have the space for it but I make the space because I don't want to lose access to the tech”.

To summarize, the current instructional infrastructure at Whitman Middle School does not minimally support the current STEM program as currently conceptualized.

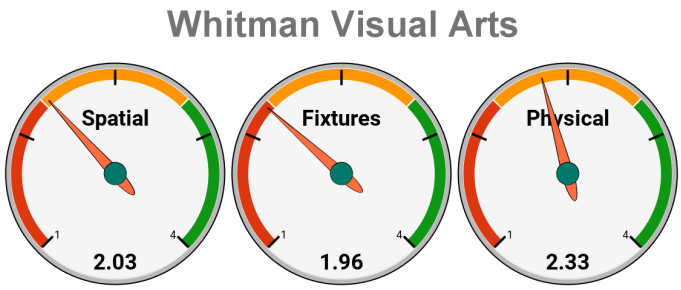
Visual Arts. Visual arts received the lowest overall rating (average score of 2.12) at Whitman Middle School aside from theatre, which has already been established and received the lowest rating because it does not exist. Similar to business and family and consumer science at Whitman, the visual arts program is supported out of a singular classroom - room 15. The physical attributes of this space are its greatest asset receiving an overall average rating of 2.33. Noted as the best quality under this subcategory is access to natural daylight which received an average rating of 3.5. The second greatest strength was identified as site lines (average rating of 2.63). Related comments state that the room is not conducive to properly monitoring projects. Overall aesthetics were identified in the greatest need of improvement (average rating of 1.63). Submitted commentary identifies many items in disrepair, outdated storage, lack of modern technology, torn up counters, and broken or jammed cabinets. Access to adequate power emerged as the second most concerning element with an average rating of 1.88 with notes that there is a lack of flexible power for student use.



Spatial layout received the next highest overall rating with an average score of 2.03. The element that received the highest marks against the Analysis of Learning Spaces rubric was personal space (average rating of 2.63). While this scored relatively favorably, commentary elevated under this subcategory acknowledges that up to 35 students can sit comfortably in their respective individual seats, it is impossible to rearrange seating options or provide a separate critique area. In other words, students are largely confined to their individual work stations. Furthermore, student

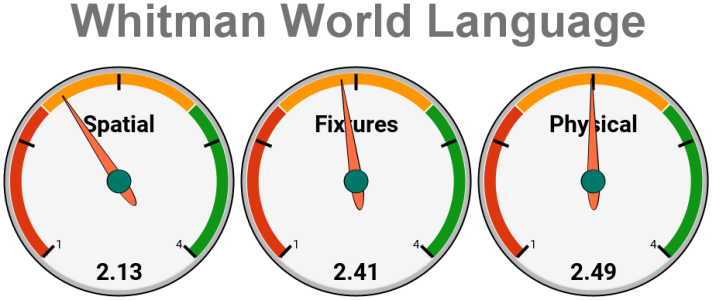
and staff's ability to properly circulate throughout the classroom is a significant challenge. Similar to other content areas at Whitman, access to small group and large group collaboration spaces is largely absent. Both received an overall average rating of 1.25. **In short, the classroom is undersized for proper programming and the number of students the program serves.**

The subcategory of furniture, fixtures, and equipment received the lowest rating on the rubric with an average rating of 1.96. Moveable furniture, space for physical models/other equipment, and fixtures/equipment all emerged as the greatest assets with an average rating of 2.13. Related comments elevate that the tables in the room are not easily moveable and the overall space of the classroom does not allow for different types of seating. It is challenging, and almost impossible, to store larger scale projects. The kiln in the room is loud and gets exceptionally hot. Of added concern is that students have exposure to the kiln. In an already crowded space, this is a safety concern. Additionally, there are no whiteboards for ideation or planning in the art room. There are cork boards, but they are mostly inaccessible due to furniture in the way. Identified as the weakest elements within this subcategory were wall-boards for displaying instructional materials and instructional preparation area - both with an average rating of 1.75. Wall space is largely covered by cabinets or access is impeded by other furniture or the teacher's preparation area. The teacher's instructional preparation area is also extremely crowded and is easily accessible to students which may compromise student privacy.



World Language. Relatively speaking, the classrooms that support world language at Whitman were identified as some of the most supportive in comparison to other content areas with an average overall rating of 2.34. The subcategory of physical attributes emerged with the strongest rating (average rating of 2.49). Access to natural daylight (average rating of 3.44) and site lines (average rating of 2.78) were identified as the greatest assets. Access to adequate power (average rating of 2.11) and adequate light/dark control (average rating of 2.06) were identified as the areas of greatest concern quantitatively under this subcategory. Relative to adequate light/dark control, comments noted that the blinds on the windows are old and let light through which interferes with students being able to properly see what is being displayed on the projecting technology in the classroom. Additionally, the older blinds are reported to be partially broken and missing functional parts such as adjustment rods. Their appearance impacts the overall curb appeal of the building to outside viewers. As for comments around adequate power, one school-based educator shared the following, "Student Chromebooks have changed the power needs in every classroom. It may be advisable to add power strips, especially those with USB connectors such as those found in airports. Students often come with their Chromebook batteries discharged, especially in the latter part of the school day. Many of them have already lost their chargers, so by having USB connector cords in a permanent fixture may help to mitigate this problem. Having power in the middle of the classroom would also help because not everyone is close to the wall outlets". While it did not emerge quantitatively as a significant concern, the qualitative comments associated with acoustics bring pause from an instructional perspective. Submitted comments note that noise pollution from air vents and neighboring classrooms by way of semi-permanent walls impedes engagement and concentration for students within the world language classrooms.

Furniture, fixtures, and equipment was the second most supportive subcategory with an average overall rating of 2.41. Wall-boards for displaying instructional materials/resources were identified as the greatest asset with an average rating of 2.72 while space for instructional equipment was identified as the element in greatest need of improvement (average rating of 2.22).



Spatial layout was the subcategory that emerged with the lowest overall average rating of 2.13. The greatest asset under this subcategory was identified as adequate space for delivery of effective instructional practices (average rating of 2.72). Access to adjacent small group collaboration spaces emerged as the area of greatest need (average rating of 1.17). One school-based assessor shared, "We have outgrown Whitman, especially in the years when the number of total students is up. We have no free space to go to". Shared space was also rated low (average rating of 1.83). Comments submitted around this element noted that different furniture may assist in improving creating such a space. Circulation access and access to storage were also rated low (both with an average rating of 2.06). In regards to circulation access, submitted comments elevate that the classrooms are filled to capacity with desks; however, different furniture may assist in providing greater circulation accessibility. Storage is very minimal in the classrooms. A room on the lower level (room 4) was once a storage room for world language; however, it has been repurposed throughout the years to provide work space for other staff members.

Overall Building - Common Spaces

Appendix AD outlines the assessed scores for the common spaces at Whitman Middle School. The following three elements were identified to be of greatest concern based on the low scores.

Access to community-building space rated the lowest with an average score of 2. Comments associated with this feature indicate that such a space really does not exist at Whitman outside of the library, cafeteria, classrooms, and the gymnasium. Due to the other purposes of these spaces, it was further communicated that it is difficult to centrally showcase student work or special projects. Staff at Whitman also do not have a comfortable space in which to gather and engage in professional learning with one another. Just like at Longfellow, this is mission critical to ensuring that a strong professional culture, anchored in academic excellence, is cultivated.

Food service was identified as the second greatest area of concern with an average score of 2.12. Submitted comments highlighted that students do not currently have access to food outside of breakfast and lunch that are served. School-based evaluators appeared to be in support of providing snacks given the comments.

Counseling and student support services was identified as the third greatest area of concern with an average score of 2.18. Related comments note that the size of the student services space is small which includes the size of the counselors' offices. There is no space for small groups to gather for counseling needs. There is

limited conference room space (one room in the entire school) not only in the student services department, but in the school in general. Additional comments note that the offices are not clearly marked, the offices are not private, and the waiting area is small.

A few other key notes as it relates to common learning spaces. The current cafeteria space is remote, undersized and lacking acoustical treatment; it is very loud. It is a traditional space for eating, lacking flexible furniture or a welcoming environment. The serving space is separate from the dining space. The front office space is dated and not well configured. It is remote from the main entry, which is a significant operational challenge. The main entrance is remote from the office area. Visitors are buzzed into a secured vestibule where an attendant greets them from behind a transaction window. That attendant is remote from the rest of the office team. A visitor, once cleared to enter the building, must walk down an unsupervised hallway to reach the office. This configuration, while secure, is not welcoming and can lead to congestion at the front door during busy periods. Whitman Middle School does not have any specifically dedicated space for outdoor learning. The site is large enough to support such a space should it be desired.

Whitman Findings Summary Analysis

At present, the greatest asset that supports a strong learning environment is the access to natural daylight. By and large, most of the instructional spaces have direct access to daylight. This is supportive for staff and student mental health, especially during winters in Wisconsin, so that there can be increased time and attention on learning.

When considering the elements that make up the subcategories of spatial layout, furniture, fixtures, and equipment, and physical attributes there were two elements that fell below the 2 designation of “partially missing” - access to adjacent small (overall average score of 1.37) and large (overall average score of 1.61) collaboration spaces were two of the three elements identified. **In general, lack of space was a common theme** in the comments - space for students and staff to gather outside of individual work spaces, space for students and staff to circulate without bumping into each other, space for large projects, and space for storage. This includes common spaces - their size is lacking.

In short, the learning spaces at Whitman Middle School are too small to support the desired, contemporary learning environment for students. In general, the school is currently uninspiring and needs significant improvements.

Overall Middle School Findings Summary Analysis

In an effort to address essential question #2, “To what extent is the student experience the same across both middle schools and both high schools?”, the following similarities exist between two middle schools. A significant highlight of both middle schools is the access to natural daylight for staff and students. Shishegar and Boubekri (2016) posit, “natural light can improve subjective mood, attention, cognitive performance, physical activity, sleep quality, and alertness in students and workers. All these factors could be considered key aspects for optimal academic and work performance” (p. 76). Therefore, as it pertains to access to natural daylight, both schools share the same advantage.

However, on the opposite end of the spectrum, both middle schools share some common barriers to teaching and learning. Both middle schools experience noise pollution. At Longfellow, this is mainly due to the HVAC system. At Whitman, this is predominantly related to the semi-permanent walls. Due to the size and the fixed features of classrooms, flexibility in furniture arrangement as well as circulation access are challenges. Additionally, key fixtures/equipment are missing from particular content areas that one would expect to be present to support programming. This is most noticeable in science, STEM, and art classrooms. **Above all else, teacher and student ability to circulate through the learning spaces needs to be improved upon. If it is not corrected, it should be expected that educators will continue to lean on outdated practices and students will not get the real-time feedback that they deserve. Furthermore, students and staff with accessibility limitations are not able to be full members of the learning community.**

The overall aesthetics of both middle schools are less than optimal. There is noticeable wear and tear in virtually every space from missing ceiling tiles, chipped paint, and poorly maintained window treatments to name a few. In sum, **the middle school learning spaces are uninspiring and instructionally obsolete**.

A key difference between the middle schools is access to a performing arts space at Whitman. Therefore, the students and staff at Longfellow do have an advantage over students and staff at Whitman simply by virtue of access to such a space. Similarly, the library/media center was identified to be “sufficient” with an average score of 3.13. Therefore, the students and staff at Whitman are disadvantaged by not having direct access to a similarly sufficient space.

In regards to common spaces at the middle schools, each building has its own unique current challenges. The greatest challenges at Longfellow Middle School

include the access to staff restrooms and bottle fillers, space to support special education, and clearly marked and secure main entrance. At Whitman Middle School, the greatest current challenges include community building space, food service, and space to support counseling and student services needs. With the exception of the aforementioned library/media space at Longfellow, the common spaces at both middle schools scored below proficient by both building-level evaluators and members of the FST.

Overall Secondary School Findings Summary Analysis

The instructional spaces at the four secondary schools in the Wauwatosa School District do not meet the expected learning conditions to support scholars in the 2020s and beyond. In fact, **100% of the content areas at each school fell below the identified "sufficient" status**. Not only are there significant updates needed from a maintenance perspective, but more importantly, there are **significant updates needed purely from an educational perspective to have these buildings sufficiently support desired programming and the level of expected instruction**.

In general, the learning spaces at all four secondary schools need to be larger to allow for greater flexibility of furniture and students and staff themselves. Circulation access was identified as a barrier at each of the schools in many of the content areas. Instructionally, the inability to move freely throughout the classroom presents a significant barrier to serving students. Teachers are expected to monitor student thinking and work so that timely feedback can be provided to feed student learning forward. If a teacher is confined to a particular area of the classroom and they cannot move about the classroom to check in on student learning, it is at the detriment of student learning.

With the exception of the recently renovated spaces at Wauwatosa East High School, the spaces that support visual arts have been largely neglected at all of the secondary schools. For a school district that prides itself on the arts, there is much more that students can accomplish if they had more supportive, safer, and healthier learning conditions. Similarly, the music spaces and culinary arts space are undersized for programming. These spaces need to be expanded to better support student learning and programming demands.

What this study has revealed is that in order to meet the instructional needs of students, ***significant*** **renovations, beyond just maintenance, are necessary**. Appendix AE illustrates each content area by school by subcategory (spatial layout,

fixtures, and physical attributes). What readers will see is that no subcategory at any school meets the “sufficient” threshold of a 3 out of 4 rating.

Limitations

While great time and attention has been given to this study, and subsequently this report, it does not come without its limitations. The variable of human error and human bias weighs highly on all social science research, and this study was no different. Every effort was made to mitigate as much subjectivity and bias as possible. However, it remains a major limitation in the study overall.

Another limitation of the study rests with educator participation. In the development stage of the Analysis of Learning Spaces rubric, educators at all secondary schools during the 2023-2024 school year had two different opportunities to weigh in on the descriptors of the rubrics. The first opportunity was in February 2024 when all staff members were invited to complete a Google Form to articulate current strengths and challenges as well as propose the ideal state. While there was a strong response rate, not everyone completed the form to provide input, thus a limitation. The second opportunity in which secondary staff were afforded an opportunity to provide feedback was after a draft of the rubrics were crafted. They were sent to content team leaders for review. The content team leaders were directed to review the rubrics with the other educators in their departments. A limitation here is that not all content areas provided any additional feedback and there is no guarantee that all educators were able to review as directed, thus another limitation.

Another limitation exists with the application of the rubric. Not all educators completed an assessment of their instructional spaces using the rubric when solicited in May 2024. Furthermore, for those that did submit an evaluation, the opportunity to calibrate on their evaluations was not provided.

A valuable voice that is void in this study is that of students. Had more time been afforded to this study, this could have been explored further. At this juncture it is simply noted as a limitation to the study.

The size of the FST is also a limitation. It was intentional to include a breadth of perspectives on this team; however, it certainly was not all encompassing.
The scope of this report was to review the four secondary schools in WSD from an instruction perspective. Out of scope the scope of this study was a comprehensive report of the grounds as well as a comprehensive safety and security audit. Therefore, this could be considered a limitation of this study.

Finally, the final reporting and data analysis is not void of researcher error. While this study was managed and authored by two professionals that hold doctoral degrees

and have engaged in quantitative and qualitative academic research, they are active practitioners. Their roles as practitioners does not allow them to solely focus on research alone.

Recommendations from Analysis of Learning Spaces

It is recommended that *if* there are future renovations to any one of the secondary schools that there is representation on the design team that has a strong teaching and learning background. This person or persons needs to have an intimate understanding of the "third teacher" that is the instructional space. It will be critical that someone on the design team has a strong understanding of what was presented in the literature review in order to avoid poor design decisions from an instructional perspective. Additionally, it is paramount that classroom teachers are afforded feedback opportunities on design plans. Similarly, educators whose expertise is serving students with disabilities need to be afforded the same feedback opportunities as classroom teachers. This will help ensure that accessibility needs inside of classrooms are not overlooked.

To educate the greater community in understanding the educational impact of the current secondary buildings, it is recommended that a strong communication plan and campaign be developed and executed. It is also recommended that members of the community serving on any committees related to updated facilities read this document in detail, tour all four secondary schools with an instructional lens, and visit other school districts that have modernized their instructional spaces to compare and contrast facilities for the learners in Wauwatosa.

If there are future renovations, it will be important for district staff to visit and meet with staff at other schools that have engaged in similar processes in an effort to not repeat design mistakes that have had unintentional consequences on instructional and program goals.

Finally, it is recommended that this analysis be followed by a "Phase II" *if* there is a community desire to address the elevated needs within WSD's secondary schools from an instructional lens. Phase II would consist of a recommendation for what the instructional spaces should look like based upon the decided grade level and building configuration. As Sanoff et al. (2001) reminds us, "responsive schools do not all look alike" (p. 15), therefore *if* there is a desire, it will be important to be responsive to the unique conditions that are present within each site. Furthermore, Phase II would be beneficial not only to ensure that building spaces serve the desired instructional programming, but also to ensure fiscal responsibility. Too often money is invested into facilities that then never get used as designed because there was a flaw in the instructional functionality. Engaging in a Phase II *Analysis of Learning Spaces* would be a beneficial mitigation against this.

Conclusion

In the District's pursuit to attend to the evolving facility needs of the four secondary schools, regular updates to the facilities condition assessment (FCA) and education space adequacy (ESA) have occurred since the 2015-2016 school year. In an effort to more deeply understand the functionality of the learning spaces within the four secondary schools, the District commissioned this Analysis of Learning Spaces study. What this study has revealed is that the learning spaces within WSD's four secondary schools are largely instructionally obsolete. Said another way, the spaces by and large are not supportive of current, let alone future, needs related to teaching and learning.

While these are the findings, this study and report is, *"intended to serve as a basis for an informed dialogue and consensus building with those involved in shaping K-12 school environments* [emphasis added]" (Sanoff et al., 2001, p. 15). As such, this report is not intended to be a leading report; rather it is intended to accomplish the aforementioned objective of Sanoff et al. (2001) - spark dialogue and consensus building.

The Wauwatosa community has long supported public education. As the community comes together to make decisions about the future of the District's secondary schools, this report aims to provide a perspective not always gleaned in making such profound decisions. This report strives to pull back the proverbial curtain and elevate the voices and experiences of those that "live" in these spaces - the voices and experiences of our students and staff.

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Appendices

AA Summary Data- Wauwatosa East High School

AB Summary Data- Wauwatosa West High School

AC Summary Data- Longfellow Middle School

AD Summary Data- Whitman Middle School

AE Summary Data by Subcategory by Content Area

AF Rubric Responses by Classroom with Comments: Business Education

AG Rubric Responses by Classroom with Comments: English Language Arts

AH Rubric Responses by Classroom with Comments: Family and Consumer Science

AI Rubric Responses by Classroom with Comments: Math

AJ Rubric Responses by Classroom with Comments: Performing Arts - Music

AK Rubric Responses by Classroom with Comments: Performing Arts - Theatre

AL Rubric Responses by Classroom with Comments: Physical Education + Health

AM Rubric Responses by Classroom with Comments: Science

AN Rubric Responses by Classroom with Comments: Social Studies

AO Rubric Responses by Classroom with Comments: Special Education - Resource + Vocational

AP Rubric Responses by Classroom with Comments: Technology Education/STEM

AQ Rubric Responses by Classroom with Comments: Visual Arts

AR Rubric Responses by Classroom with Comments: World Language