REIMAGINING HIGH SCHOOL

A Guide to Renewing Post-War Secondary Schools
in Waterloo Region

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

Ontario's public education system is in a state of crisis; this is evident in the architecture of schools. Many of Ontario's secondary schools were built during the post-war era (1955-1975), and education continues to operate within buildings that reflect the values and priorities of that time. Education during this period was highly institutionalized, and buildings were designed with the intention of enforcing rigid standards of learning and behaviour. Classrooms prioritized control and uniformity to administer required tests and performance assessments effectively. While funding has been directed towards additions and band-aid solutions, these schools have become crowded over time, consequently relying on portable classrooms. Despite shifts in educational values and pedagogy, the architecture of secondary schools has remained largely unchanged for the past fifty years, failing to meet the priorities and evolving pedagogy of today.

Since the post-war era, educators and policymakers have acknowledged that each student and school community has unique needs. While recent pedagogical advancements have been successfully integrated into well-funded, progressive, and newly constructed schools, there is still a gap in understanding how existing infrastructure, particularly post-war schools, can be upgraded to support these educational principles. The thesis research proposal seeks to develop a framework for reimagining secondary education by renewing an existing post-war secondary school in the Waterloo Region, Ontario. The proposal aims to support modern educational practices, embracing 21st-century learning, diverse learning styles, and community-based education. To guide this research, three interconnected scales are examined: the classroom, the school building, and the surrounding urban context.

The research objectives are to assess the current state and future vision of public education in Ontario, understand the evolving needs of 21st-century learners, and explore how schools can support both student development and community well-being. The research culminates in a set of design guidelines that outline strategies for renewing existing school buildings into inclusive, adaptable, and community-oriented environments that reflect contemporary educational values. The primary guiding questions are: How can post-war secondary schools, originally designed under outdated educational philosophies, be adapted for 21st-century learning? In what ways can spatial design foster a sense of belonging, engagement, and well-being among students? How can the schools establish a closer connection with their surrounding communities?

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DEDICATION

To my Papa, who inspired me through his care for those around him, his strong work ethic, and his creativity in everything he did. The memories we shared working in the garden, cooking meals, and tackling projects together taught me lessons in patience, resourcefulness, and collaboration that continue to guide my work and thinking.

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Source: Ed White Photographic. École Salish Secondary School. KMBR Architects. https://www.kmbr.com/portfolio/ecole-salish-secondary-school-2/

134 Fig. 4.48 Windows with seating and storage, St. Mildred's-Lightbourn School, ON

Source: St. Mildreds-Lightbourn School. LGA Architectural Partners. https://lga-ap.com/portfolio/st-mildreds-lightbourn-school/

135 Fig. 4.49 Proposed learning studio design

136 Fig. 4.50 The corridor as a classroom, Marine Drive Academy, NS

Source: Parkinson, Julian. "Marine Drive Academy." FBM Architecture Ltd., 2020. https://www.fbm.ca/projects/marine-drive-academy

136 Fig. 4.51 Small lockers as social hubs, Handsworth Secondary School, BC

Source: Ed White Photographic. "Handsworth Secondary School." KMBR Architects. https://www.kmbr.com/portfolio/handsworth-secondary-school/

136 Fig. 4.52 Seating arrangements, Handsworth Secondary School, BC

Source: Ed White Photographic. "Handsworth Secondary School." KMBR Architects. https://www.kmbr.com/portfolio/handsworth-secondary-school/

137 Fig. 4.53 Proposed fragments of the learning street

137 Fig. 4.54 Elevation of proposed learning street

139 Fig. 4.55 Proposed site axonometric highlighting areas of focus for the building scale redesign

141 Fig. 4.56 Proposed learning commons design

142 Fig. 4.57 Atrium main entrance, Handsworth Secondary School, BC

Source: Ed White Photographic. "Handsworth Secondary School." KMBR Architects. https://www.kmbr.com/portfolio/handsworth-secondary-school/

142 Fig. 4.58 Atrium with balconies and stair seating, R.E. Mountain Secondary School, BC

Source: HCMA Architecture + Design. "R.E. Mountain Secondary School." https://hcma.ca/project/r-e-mountain-secondary-school/

142 Fig. 4.59 Atrium as a circulation space, Oak Bay High School, BC

Source: HCMA Architecture + Design. "Oak Bay High School." https://hcma.ca/project/oak-bay-high-school/

143 Fig. 4.60 Reimagined atrium space

145 Fig. 4.61 Proposed gymnasium redesign

146 Fig. 4.62 Views into gymnasium, Shas Ti Kelly Road Secondary School, BC

Source: HCMA Architecture + Design. "Shas Ti Kelly Road Secondary School." https://hcma.ca/project/shas-ti-kelly-road-secondary-school/

146 Fig. 4.63 Extending gymnasium to the outside, Common Ground High School, CT

Source: Gray Organschi Architects, "Gray Organschi Completes Wooden High School Extension with Irregular Roofing in Connecticut." Architecture. Dezeen, September 2, 2019. https://www.dezeen.com/2019/09/02/gray-organschi-high-school-connecticut/

146 Fig. 4.64 Retrofitted interior windows, Thorncliffe Community Centre, ON

Source: Thorncliffe Community Centre & Childcare. urbanNext. https://urbannext.net/thorncliffe-community-centre-childcare/.

147 Fig. 4.65 Reimagined gymnasium space

149 Fig. 4.66 Proposed community centre design

150 Fig. 4.67 Welcoming community entrance, Common Ground High School, CT

Source: Gray Organschi Architects, "Gray Organschi Completes Wooden High School Extension with Irregular Roofing in Connecticut." Architecture. Dezeen, September 2, 2019. https://www.dezeen.com/2019/09/02/gray-organschi-high-school-connecticut/

150 Fig. 4.68 Transparency between programs, R.E. Mountain Secondary School, ON

Source: HCMA Architecture + Design. "R.E. Mountain Secondary School." https://hcma.ca/project/r-e-mountain-secondary-school/

150 Fig. 4.69 Daycare with exterior connection, Thorncliffe Community Centre, ON

Source: "Thorncliffe Community Centre, Childcare & Library." LGA Architectural Partners. https://lga-ap.com/portfolio/thorncliffe-community-centre-childcare-library/.

151 Fig. 4.70 Potential community connections for WCI

Source: Drawing made by the author. Data retrieved from City of Waterloo Open Data. "Creeks" [shapefile], "Building Footprint" [shapefile],"GRT Routes" [shapefile], "Regional Boundary" [shapefile], "Rivers" [shapefile], "Roads" [shapefile]. https://data.waterloo.ca/.

153 Fig. 4.71 Potential connection for WCI at University Stadium

Source: Google Earth, screenshot taken by author.

153 Fig. 4.72 Potential connection for WCI at neighbouring elementary school

Source: Google Earth, screenshot taken by author.

153 Fig. 4.73 Potential connection for WCI to trails and parks

Source: Google Earth, screenshot taken by author.

153 Fig. 4.74 Potential connection for WCI to local offices

Source: Google Earth, screenshot taken by author.

154 Fig. 4.75 Example of community garden in an urban setting

"Hidden Social Dimension of Infrastructure," https://www.fbm.ca/projects/hidden-social-dimension-of-infrastructure.

154 Fig. 4.76 Campus gathering space at Australian National University in Acton, Canberra, Australia

Groehn, Florian. "Kambri Precinct, Australian National University," ASPECT Studios, https://www.aspect-studios.com/projects/kambri-precinct-australian-national-university.

154 Fig. 4.77 UBC Okanagan Commons in Vancouver, BC

"UBC Okanagan Commons." Bush, Bohlman & Partners LLP. https://www.bushbohlman.com/projects/commons-ubc-okanagan/.

154 Fig. 4.78 Kitsilano Farmers Market in Vancouver, BC

"Kitsilano Farmers' Market." The BC Farmers' Market Trail. https://bcfarmersmarkettrail.com/market/kitsilano-farmers-market/.

155 Fig. 4.79 Proposed site plan

157 Fig. 4.80 Vignettes of proposed outdoor spaces

159 Fig. 4.81 Reimagined outdoor space

CONCLUSION

162 Fig. 5.1 A reimagined secondary school space

0.0 PREFACE

0.1 My Experience in the Public School System



All our large events would be held in the gym: performances, assemblies, dances and much more. Yet the space felt dull and draining to be in with no natural light or connection beyond the four solid walls

Fig. 1.1 Lansdowne Middle school gymnasium

To give context to my research interests and why I pursued this thesis, I will first expand on my own experience in the public school system growing up in Victoria, BC. My experience diverged immensely between middle school and secondary school; this was not only due to personal growth but also a drastic change in school environments.

My middle school, a post-war construction building, resided on a large lot in a suburban area. It was located near a main road; despite this, the school felt isolated from the surrounding community. The site, which was once an airport, had rows of trees and endless fencing bordering it. Formally known as Lansdowne Airfields, the area was transformed into a school and surrounded with housing developments. During my years at the school, the expansive, underutilized field often felt empty. We cycled through the same four uninspiring classrooms, which I now recognize as having teacher-centric layouts, along with dim lighting and uncomfortable environments caused by fluctuating temperatures and stale air. The lower-grade students were often placed in two portable classrooms. The portables felt even darker: damp and musty from the near-constant rain seeping into their supposedly "temporary" structures. Without a cafeteria or social spaces, students filled the locker-lined corridors at lunch, sitting on the dust-covered ground to eat. When released for outdoor time, we had a few options for gathering or seating. Students sat on cold metal site storage boxes, concrete stairs, or the boundary edge of the unused playground. The 25-acre field, almost always damp and unmaintained, remained mostly empty. The physical conditions were unaccommodating to individual learning needs, comfort, or social interaction, yet there was a keen sense of identity within the school community. The students and teachers worked together to initiate changes to the built environment as needed; the building reflected this evolution.

In contrast, my secondary school was a unique experience. I was fortunate to attend a newly designed school, which I now recognize as thoughtfully



The large, empty field of my middle school (formerly Lansdowne Airfields) was often unused due to poor maintenance, and most of it was fenced off from the community with little programming

Portable classrooms accommodated the excess of students, isolating them from the formal school building premises

When the fields were wet from frequent rain, many of my lunches were spent sitting on the concrete steps with friends, seeking shelter under the small roof overhangs

Fig. 1.2 Aerial view of Lansdowne Middle School site

crafted to support 21st-century learning needs. The new building replaced two older structures that no longer met seismic standards. I never attended the old buildings and appreciated the newer space, although those who did expressed a sense of loss at its demolition. They missed walking between buildings, the character of the old structures, and the spaces that held memories. However, the school represented a new era for both students and the surrounding community: one of connectivity. Each classroom was bright, flexible, and equipped according to subject-specific needs. The building fostered a connection with vertical views, a spacious atrium featuring "social stairs," classrooms with garage doors and windows both to the exterior and interior corridor, seating above lockers, and community-oriented spaces like a daycare. The schedule even included a daily "focus block," allowing students to work independently anywhere in the building or seek extra help from teachers. At lunch, students would spread throughout the school, eating in the multipurpose atrium, classrooms, on the social stairs, in small alcoves, or outside in landscaped areas. Despite an enrolment of nearly 1,400 students, the school never felt overcrowded. Instead, it encouraged a sense of community.

In both of my experiences, which were in very different environments, I was impacted by the physical spaces around me, even if I was not fully aware of it at the time. Now, as an architecture student, I can trace that influence and recognize the profound impact that architecture and design can have on the human experience. It was not until I attended my bright, transparent high school that I truly felt free to learn with curiosity and be fully engaged, however the building was only one part of this. As well, reflecting on my secondary school experience from an architecture student perspective, I now recognize the wastefulness of demolishing existing buildings. None of the materials were repurposed or salvaged; everything was simply torn down. The carbon and economic costs of this approach make it an unsustainable model for upgrading all post-war public schools. Demolition generates construction waste and rebuilding means new resources with high carbon emissions. Even knowing these realities, my middle school experience highlights for me the urgent need for improvement in these aging buildings.



The social stairs of my newly built high school was the heart of the building, centrally located to create a point of connection between the gym, theatre and the bright corridors. This in-between space was always active, creating a social street for students.

Fig. 1.3 Oak Bay High School social stairs

This thesis is shaped by my two contrasting school experiences and is written from three perspectives: the middle school student who felt frustrated and uninspired by an outdated building, the secondary school student who benefited from an innovative learning environment, and the architecture student, who now understands both the impact and potential of architecture on the human experience, along with a deeper understanding of the financial, environmental, cultural and social loss of demolishing durable post-war schools.



Vertical visual connections were used throughout the building both for views out and for abundant access to daylighting

The entrance had the feeling of being 'grand', yet human in scale, welcoming the entire community with a sense of pride and belonging

The outdoor seating, strategically designed around a large preserved oat tree, provides shading, cooling, and softens the entry experience using nature as a frame

Fig. 1.4 Oak Bay High School front entrance

0.2 Guide to Annotations

Throughout this thesis, annotations run alongside text, diagrams, and drawings, providing context, reflections, or clarifications. Each annotation, distinguished by style and color, reveals the author's design thinking, research, and reflections, making the process transparent and allowing the reader to follow the evolution of ideas and connections developed throughout the thesis. The below legend breaks down the approach to annotations in the thesis:

Blue Annotations:
Architectural Observations

These notes highlight architectural details linked to images, diagrams, or drawings. These reflect my own observations or reference points discussed in the primary text. The blue annotations investigate physical space and the potential social impacts related to those spaces.

Grey Annotations:
Personal Reflections

The grey notes are based on my personal experiences within the public school system. While my feelings and attitudes may be individual, they aim to offer empathy and insight into what other students may experience and highlights the importance of lived experience in grounding the design process

Boxed Annotations:
Factual Information

The boxed notes are referenced research to provide the reader with more context. While not always directly connected to images or the primary text, they offer useful background for understanding the themes and subjects embedded in each section.

Red Annotations:
Technical Considerations

Dark red notes are primarily used in the design chapter. These notes address structural, mechanical, or envelope considerations for design. While such details are generally beyond the scope of this thesis, they offer tangible, evidence based insights on how schools can be retrofitted.

1.0 INTRODUCTION

1.1 Context of Thesis

> *Our characters as adults are rooted in the experiences we have as children, influenced in particular by our early built surrounds. As a child you need to be content both at home and at school in order to reach your potential. So, the onus is on architects, educators, and parents to try to provide the best environments for children to develop both intellectually and emotionally.*[1]
>
> — Herman Hertzberger, Dutch architect and professor.

By the time I got to high school, I remember school feeling like a never ending dread. The routines, tests, and constant anxiety were exhausting... These monotonous 15,000 hours - broken up into years, months, days - felt like they would never end. Reflecting on this reminded me that each student learns and engages with the world differently.

Public education plays a foundational role in shaping youth into engaged, competent citizens.[2] Throughout their schooling, students spend approximately 15,000 hours in classrooms—nearly as much time as they spend at home.[3] This vast portion of their waking lives is spent in environments that profoundly influence their growth, identity, and long-term well-being. Many researchers advocate that the built environment is a "third teacher," teaching perception and behaviour on a social and experiential level.[4] Given the clear relationship between student well-being and environment, the built environment of schools is just as important as the curriculum itself in ensuring that every student thrives. With a vision aimed at creating a strong foundation for students' futures, the Ontario Ministry of Education (OME) defines the purpose of education as providing "students with the opportunity to realize their potential and develop into highly skilled, knowledgeable, caring citizens who contribute to their society."[5] However, the sheer amount of time students spend in schools and classrooms raises an essential question: Does the built environment of schools truly support this mission and foster student well-being?

Many of Ontario's secondary schools were built during the post-war era (1955-1975) and education continues to operate within those buildings, reflecting the values and priorities of that time. Education during this period adhered to a highly institutionalized typology, with buildings designed to enforce rigid standards of learning and behaviour.[6] Classrooms prioritized control and standardization to administer required tests and performance assessments effectively.[7] Corridors were designed to minimize lingering, windows were reduced to eliminate distractions, and layouts were oriented around teacher-centric instruction. While funding has been directed towards additions and band-aid repairs to meet code requirements, these schools have become crowded over time, consequently relying on portable classrooms.[8] Despite shifts in educational values and pedagogy, the architecture of secondary schools in Ontario has remained largely unchanged for the past fifty years, failing to meet the priorities of today.

"Teacher-centric instruction" is a traditional method in which teachers hold full authority and serve as the primary source of knowledge.[1] They stand at the front of the classroom, leading lessons and directing the flow of learning.

1 Rahul Pal, "Teacher-Centered Vs Student-Centered: A Detailed Comparison," 21K School India, May 19, 2025, https://www.21kschool.com/in/blog/teacher-centered-vs-student-centered/.

Since the post-war era, research has demonstrated that each student and school community have unique needs. In *Frames of Mind: The Theory of Multiple Intelligences*, American developmental psychologist and Professor of Cognition and Education, Howard Gardner identified eight types of intelligences: verbal/linguistic, logical/mathematical, visual/spatial, musical/rhythmic, bodily/kinesthetic, interpersonal/social, intrapersonal/solitary, and naturalist.[9] The research argues that these different learning styles strongly influence how students learn best, and that teaching environments should be designed to accommodate each. Furthermore, in the anthology *21st Century Skills: Rethinking How Students Learn*, editors James Bellanca and Ron Brandt propose a framework that reimagines education, intending to prepare students for the evolving world of globalization and technological advancements.[10] This framework encourages teaching practices that cultivate critical thinking and problem-solving skills in students. As one can imagine, these skills are difficult to adopt in standardized models and inflexible classrooms alone. Already, the OME has started to embody elements of 21st-century learning into the curriculum, with educational policies and resource guides such as *Learning for All* establishing a new approach to teaching materials.[11]

Howard Gardner is also the author of "Five Minds for the Future," a book that explores the essential ways of thinking needed for the fast-paced 21st century. He identifies the five key "minds" as: the disciplined, synthesizing, creating, respectful, and ethical.[2]

2 Howard Gardner, *Five Minds for the Future* (Harvard Business Review Press, 2009).

To shed light on another approach to education, *Place- and Community-based Education in Schools*, developed by Gregory A. Smith and David Sobel, suggests that the community should provide the context for learning.[12] In this theory, student work alternatively focuses on the local area needs and interests, giving students agency over their education. At the same time, community members can play an active role in educating the youth. Overall, educational models are developed with empathy for the student and to foster a sense of student belonging within the community. While recent pedagogical advancements have been successfully integrated into well-funded, progressive, and newly constructed schools, there is still a gap in understanding how existing infrastructure, particularly post-war schools, can be upgraded to support these educational principles.

1 Hertzberger (Foreword), Murray Hudson and Terry White, *Planning Learning Spaces: A Practical Guide for Architects, Designers and School Leaders* (Laurence King Publishing, 2019), 9.

2 Hudson and White, *Planning Learning Spaces: A Practical Guide for Architects, Designers and School Leaders*, 7.

3 Michael Rutter and Barbara Maughan, *Fifteen Thousand Hours: Secondary Schools and Their Effects on Children* (Paul Chapman Publishing, 1994), 1.

4 Neil Gislason, "Placing Education: The School as Architectural Space," *Paideusis* 16, no. 3 (2020): 7, https://doi.org/10.7202/1072485ar.

5 "Education Act, R.S.O. 1990, c. E.2, c.25, s.1 | Ontario.Ca."

6 Hilary Hughes et al., eds., *School Spaces for Student Wellbeing and Learning: Insights from Research and Practice* (Springer Singapore, 2019), 62, https://doi.org/10.1007/978-981-13-6092-3.

7 Hughes et al., *School Spaces for Student Wellbeing and Learning*, 56.

8 *Ontario School Boards: School Building Condition, Student Capacity and Capital Budgeting* (2024), https://fao-on.org/en/report/school-boards-capital-2024/.

9 Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (Basic Books, 2011).

10 James Ballanca and Ron Brandt, *21st Century Skills: Rethinking How Students Learn* (Solution Tree Press, 2010).

11 Ontario Public Service, *Learning for All – A Guide to Effective Assessment and Instruction for All Students, Kindergarten to Grade 12* (Queen's Printer for Ontario, 2013).

12 Gregory A. Smith and David Sobel, *Place- and Community-Based Education in Schools* (Routledge, 2010).

1.2 A Brief History of the Public School

The architecture of public schools has historically been shaped by policies and regulations rather than visual qualities or shifts in pedagogy.[13] This typology has developed cautiously, favouring established trends over bold innovation.[14] When architects introduce designs that align with progressive teaching methods, subsequent moves toward standardization nullify advancements.

Before the 1800s, education was considered a privilege of the aristocracy and a bastion of religious orders.[15] However, over the course of a century, it became recognized as a powerful component in shaping culture. In 1816, the Government of Upper Canada enacted the "Common School Act", which allowed any community with at least twenty students to establish a school.[16] In response, schoolhouses were constructed with classrooms designed primarily to allow surveillance and exert control over space.[17] One curriculum model utilized was the traditional *grammar school*, rooted in a 16th-century system, where classes were organized by students' existing knowledge rather than by age.[18] In these Victorian-style single-room buildings, students shared desks bolted to the floor, and instruction focused solely on the basics of reading and writing.[19] Another approach was the *monitorial system*, which aimed to engage a wide range of students simultaneously by fitting as many learners as possible into one space for teacher-led instruction.[20] In both models, the architectural design emphasized control and order through small, inflexible spaces and singular room buildings oriented toward the teacher, reflecting an educational philosophy that prioritized basic literacy without inviting critical thinking.

13 Kalervo Gulson and Colin Symes, *Spatial Theories of Education: Policy and Geography Matters*, 1st Edition (New York: Routledge, 2007).

14 Neil Gislason, "Building Paradigms: Major Transformations in School Architecture (1798-2009)," *Alberta Journal of Educational Research* 55, no. 2 (March 9, 2010): 231, https://doi.org/10.55016/ojs/ajer.v55i2.55322.

15 Jennifer Wallner, *Learning to School: Federalism and Public Schooling in Canada* (University of Toronto Press, 2014), 119, https://doi.org/10.3138/9781442669284.

16 Shannon Kyles, "Schools," Ontario Architecture, 2000, http://ontarioarchitecture.ca/school.htm.

17 Hilary Hughes, Jill Franz, and Jill Willis, eds., *School Spaces for Student Wellbeing and Learning: Insights from Research and Practice* (Singapore: Springer Singapore, 2019), 62, https://doi.org/10.1007/978-981-13-6092-3.

18 Gislason, "Building Paradigms," 231.

19 Gislason, 231.

20 Gislason, 232.

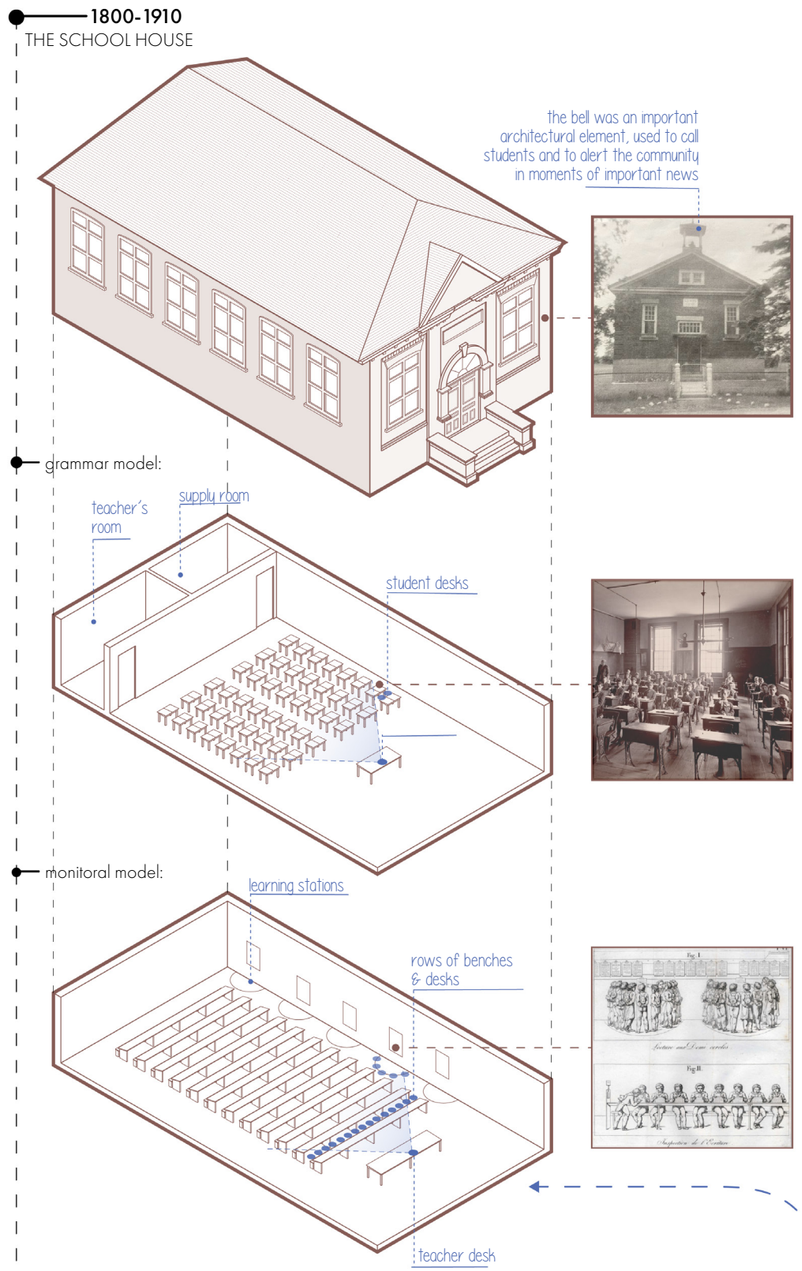


Fig. 1.5 The schoolhouse typology from 1800-1910

Fig. 1.6 Image of Dickie Settlement Schoolhouse in Cambridge, ON, 1915

Fig. 1.7 Interior image of the grammar school model

Fig. 1.8 Sketch illustrating the monitoral school model

Between the 1910s and 1950s, the evolution of public education in Canada was driven by a combination of funding, rapid urbanization, modernization, and an emerging health movement.[21] As industrialization and the economic climate grew in Canada, there was a demand for educated citizens.[22] The curriculum was modernized to include more advanced subjects such as physics, chemistry, and technical studies. [23] In reaction, the design of school buildings underwent a transformative shift. Traditional schoolhouses were replaced by larger facilities built with new construction technologies. Expanded building footprints accommodated additional programs such as cafeterias, laboratories, workshops, and fields, marking a departure from the conventional formal school model.[24] While desks continued to be arranged in rows, classrooms began to be configured around H-, U- or T- shaped corridors. These changes accommodated the growing student population and offered more flexible design approaches. With heightened concerns for student health, these modern designs also integrated improved ventilation, enhanced sanitation, and ample natural light.

In the post-war era after 1950, schools emerged as cornerstones to suburban communities with the baby boom creating a demand for rapid growth.[25] Provincial spendings jumped to nearly 30% on education, with nearly 25% of the population attending school.[26] At the same time, education was now truly seen as a citizen right rather than a convenience to have; Canada wanted to establish an educational system to be proud of. In many ways, this period represented architectural ambition and experimentation with the instrumental funding and initiative to build suburban communities.[27] Schools were centrally located on large lots of suburban neighbourhoods,

In 1913, the New York State Commission of Ventilation began a study examining various ventilation systems, occupant responses, the incidence of disease, and fuel consumption. The result of this project was a guide outlining proper temperature control and ventilation rates in classrooms.[3]

3 John E Janssen, *The History of Ventilation and Temperature Control*, 1999, 49.

21 Gislason, "Building Paradigms," 238.
22 Wallner, *Learning to School*, 2014, 122.
23 Gislason, "Building Paradigms," 237.
24 Gislason, 239.
25 Wallner, *Learning to School*, 2014, 151–152.
26 Wallner, 152.
27 Kurt Clausen, "Educational Reform in Ontario: The Importance of Pleasant Avenue School, 1962-1975," *Historical Studies in Education / Revue d'histoire de l'éducation*, May 1, 2014, 68, https://doi.org/10.32316/hse/rhe.v26i1.4365.

1910-1950
THE PUBLIC SCHOOL

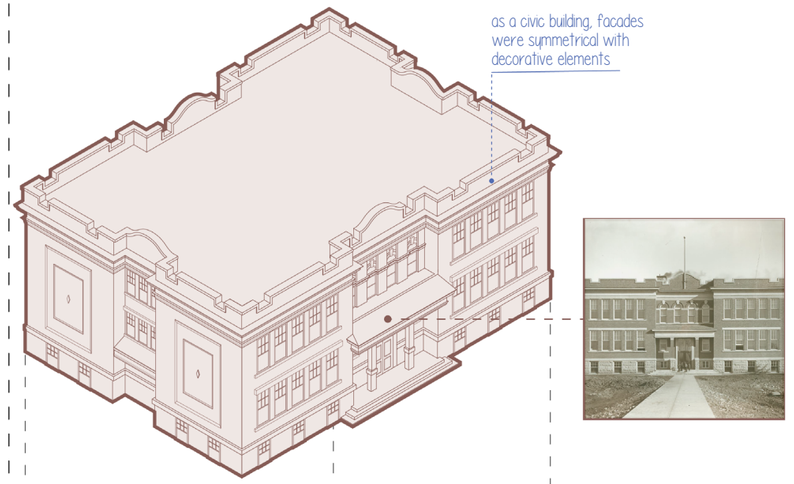


Fig. 1.9 Image of Manchester Public School in Cambridge, ON, 1917

Fig. 1.10 Interior image of King Edward Public School in Toronto, ON, 1940s

Fig. 1.11 The public school typology from 1910-1950

following expansive one or two-storey typologies.[28] Progressive thinking pedagogy was being released, discussing ways of motivating and inspiring students while encouraging hands-on learning.[29] Flexible-use planning with movable classroom partitions, open-plan classrooms, and indoor-outdoor connections were introduced into elementary school design. Crow Island School, designed by Eliel and Eero Saarinen, became a major influence with its efficient layout, abundant natural light, and strong connection to the outdoors, achieved in part through its signature L-shaped classrooms. While flexible and progressive school design was heavily explored in elementary schools to support child-centered learning, secondary school design remained largely untouched; as functional institution, there has historically been a lack of attention to secondary school design.[30] Nonetheless, all schools began to break free from traditional H-, U-, or T-shape typologies, experimenting with less rigid expressions.

Often seen as the peak of Canada's public-school construction, 1967 marked a time of great optimism and prosperity.[31] However, this was proved to be short-lived. As stated by Canadian historian and writer, Pierre Berton, 1967 was Canada's "last good year."[32] With economic difficulties and political anxieties such as debates over federal-provincial responsibilities, including funding for education, any sense of security and optimism vanished. Construction of public schools all but halted. Nonetheless, pedagogy continued to advance with researchers debating the future of education and different approaches to design. While secondary school design had been neglected for many years, in 1968, the *Educational Facilities Laboratories (EFL)*, a nonprofit research organization focused on improving school facilities, examined issues of school architecture to find progressive design principles at the secondary school level.[33]

28 William McDonough and Michael Braungart, *Cradle to Cradle* (New York: North Point Press, 2002), 139.
29 Gislason, "Building Paradigms," 244.
30 Gislason, 245.
31 Wallner, *Learning to School*, 2014, 180.
32 Pierre Berton, *1967: The Last Good Year* (Toronto: Doubleday, 1997), 364.
33 Gislason, "Building Paradigms," 245.

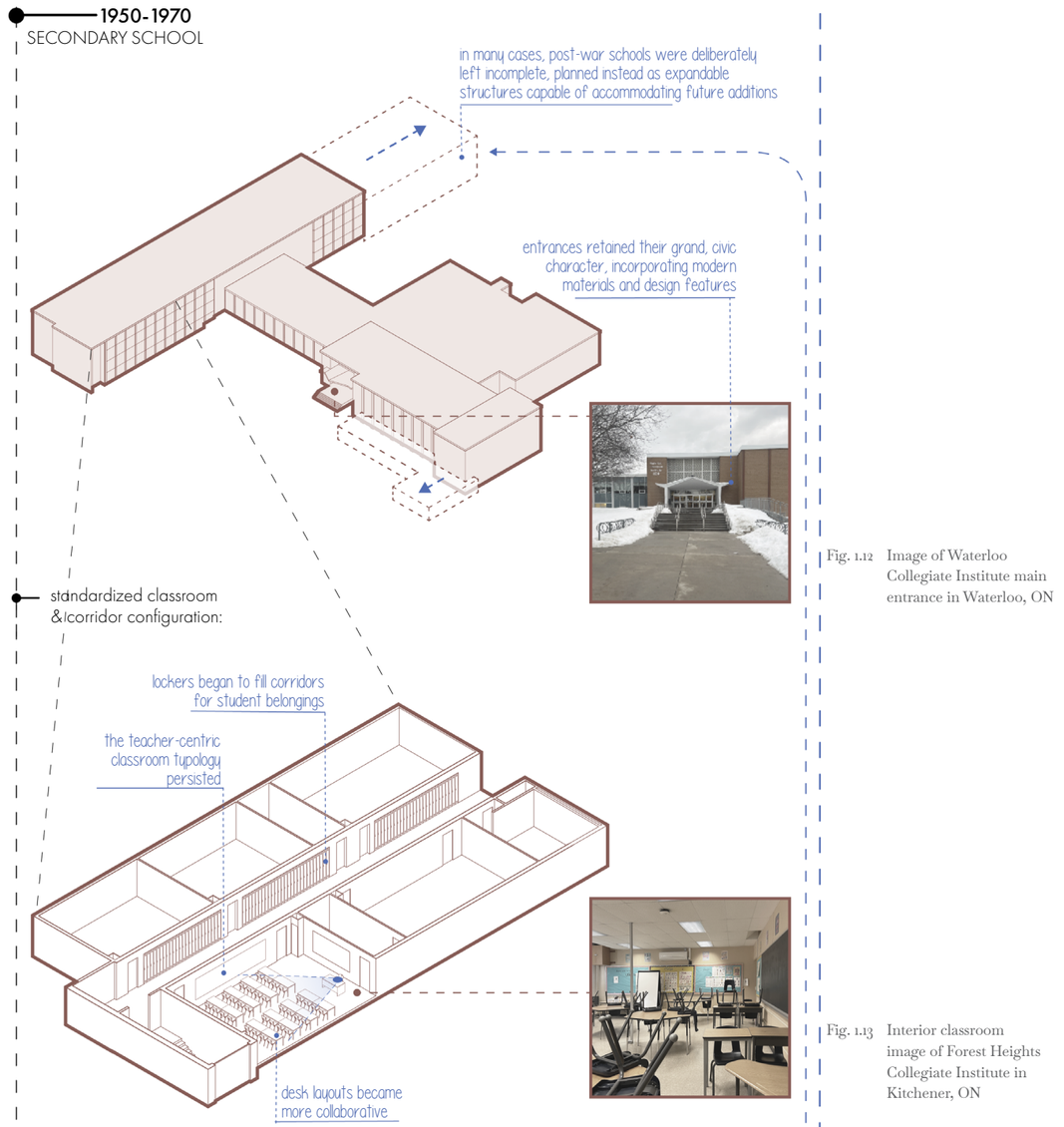


Fig. 1.14 The secondary school typology from 1950-1970

Fig. 1.12 Image of Waterloo Collegiate Institute main entrance in Waterloo, ON

Fig. 1.13 Interior classroom image of Forest Heights Collegiate Institute in Kitchener, ON

As a solution to the found issues, the EFL advocated for self-directed learning: "The high school student ideally becomes [...] responsible for his own learning. Guidance is essential, of course, but with self-reliance the norm."[34] In the 1968 report *Educational Change and Architectural Consequences*, EFL proposed the replacement of the classroom with a subject-matter "learning suite."[35] The group suggested that the suites be hosted in different "houses," each containing 500 students to give the students and faculty a sense of community and identity.[36] Unfortunately, this progressive thinking was not translated into the design of secondary schools in Ontario with the diminished boom of school construction.

After the progressive period pre-1967, the goal of quality and standardized education gradually replaced all other motives. In 1984, the Canadian Education Association conducted an opinion poll to gauge public attitudes toward elementary and secondary schools.[37] Only 10% of Canadians awarded their schools an "A" grade, with a significant 35% assigning a "C" grade. Many citizens felt that secondary education was failing to adequately prepare students for higher education. With no specific criteria in place, teachers were able to inflate grades unchecked by any proper governance. Taxpayers began questioning the effectiveness of the system, particularly since eliminating standardized tests years earlier had left no way to measure or compare the quality of education across provinces.[38] In response to these concerns, standardized tests and curricula were reintroduced to address funding issues and improve educational outcomes as well as teachers' skills. Evaluation and monitoring became central to focus on accountability and quality. With fewer secondary schools being constructed and growing populations, funding was instead directed toward minor repairs, necessary additions, and portables as schools exceeded capacity.

34 Ronald Gross and Judith Murphy, *Educational Change and Architectural Consequences: A Report on Facilities for Individualized Instruction* (New York: Educational Facilities Labs., Inc., 1968), 26.Inc., 1968

35 Gross and Murphy, 68.

36 Gross and Murphy, 67.

37 Wallner, *Learning to School*, 2014, 209.

38 Wallner, 210.

HALT OF CONSTRUCTION AFTER 1970

ADAPTED PEDAGOGY

open classroom:

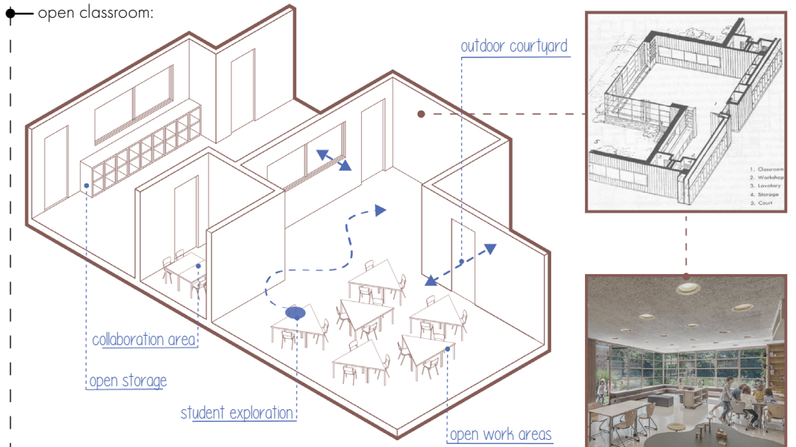


Fig. 1.15 Diagram of Crow Island School classroom in Winnetka, US

Fig. 1.16 Interior image of Crow Island School classroom in Winnetka, US

learning suites:

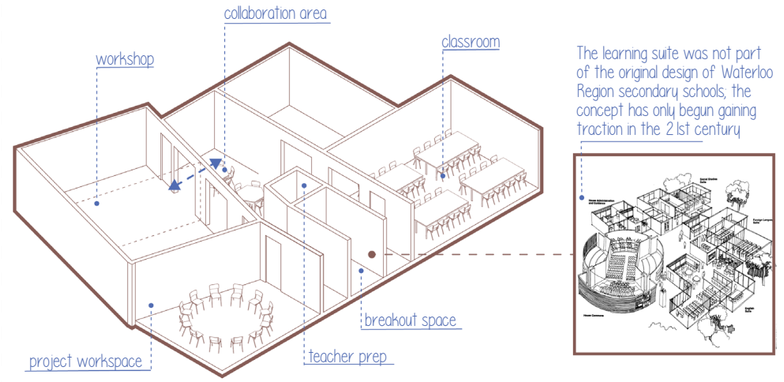


Fig. 1.17 Diagram of EFL learning suite concept

Fig. 1.18 Adapted pedagogy after 1970

As attention has shifted toward the quality and standardization of education, many long-standing conventions have persisted. This rigidity is reflected in standardized and time-structured curricula that dominate schools today. In the architecture of secondary schools, it is suggested that every student is still expected to learn in the same way.[39] However, more recent research is prompting a re-evaluation of traditional classrooms and the role of the school. Historically, schools were constructed to produce uniform, university-bound students destined for academic or professional careers. Discipline and conformity were enforced, often through both institutional practices and the physical design of school buildings, which reflected these priorities. Today, with a growing understanding of diverse learning styles, student needs, and workforce demands, there is increasing awareness that schools should instead support the development of individuals based on their unique needs for overall long-term success. Not all students need to follow a path toward academia or professional careers; society relies on a variety of skilled individuals. The design of schools must encompass a range of experiences and ways of learning as it is becoming increasingly clear that there is a demand for change.

A Note on Historical Scope and Intent:

While the historical overview is kept brief, it is crucial to recognize that this thesis builds upon decades of research and innovation by architects dedicated to designing schools in the best interests of students. The conviction that schools and education must be improved for students to succeed is not new; extensive research, effort, and advocacy support the pursuit of better educational environments. This thesis condenses this history to foreground the current state of school conditions in Ontario, where many institutions have yet to adopt these modern ideas and interventions. Architects such as Eero Saarinen advanced early ideas of child-centred school design through projects such as Crow Island School in the 1940s. Similarly, since the 1960s, architects such as Herman Hertzberger have challenged conventional conceptions of schools by emphasizing "in-between" spaces that support social interaction and the creation of varied, informal learning zones. The apparent gap in school design from 1975 to the present does not indicate a lack of research or innovation but rather reflects stagnation in school construction and renewal practices within the province, burdened by systemic constraints such as chronic underfunding. This work advocates for the integration of existing research and innovative design strategies into current school buildings, emphasizing that meaningful progress is both achievable and necessary.

39 Albert Shanker, "Restructuring Our Schools," *Peabody Journal of Education* 65, no. 3 (March 1988): 89, https://doi.org/10.1080/01619568809538615.

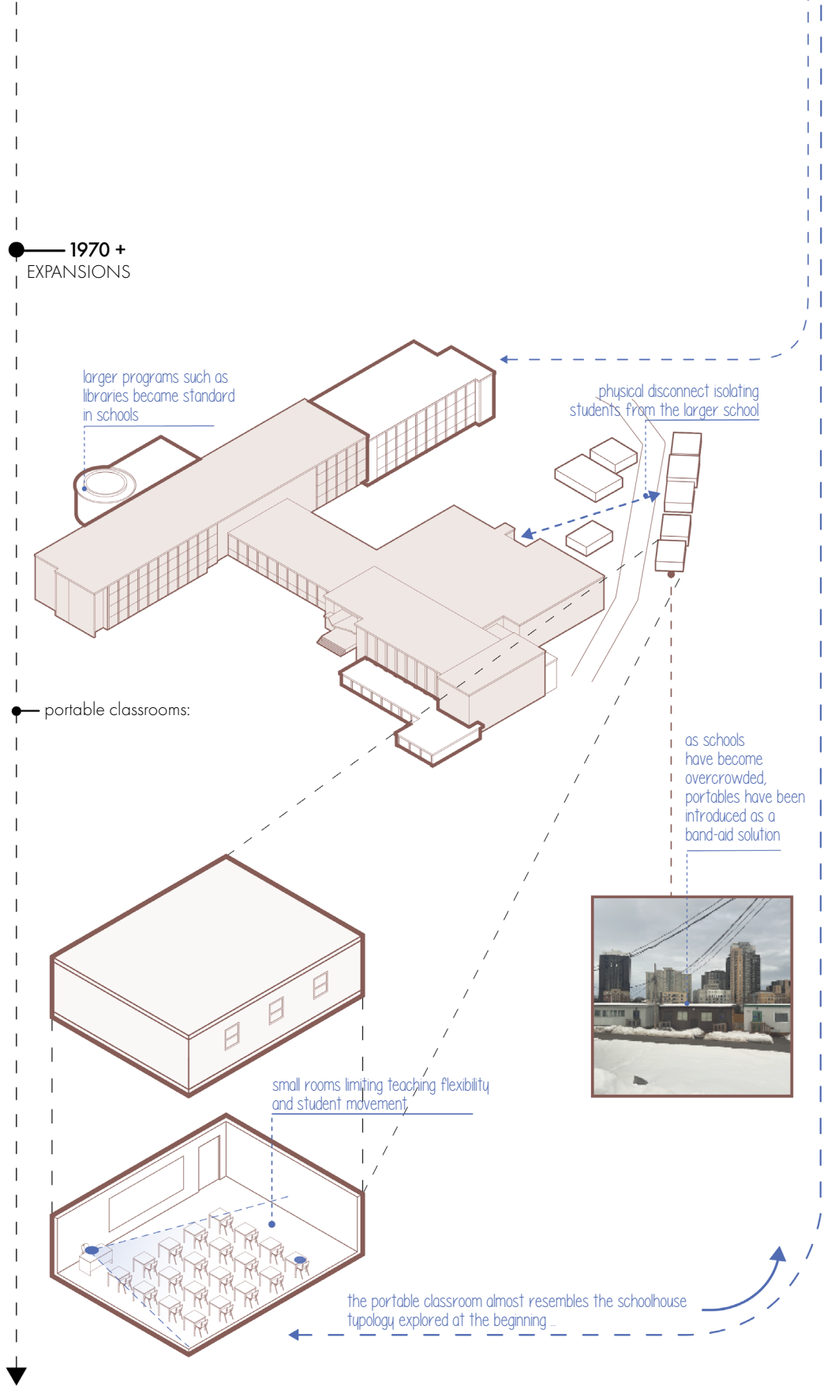


Fig. 1.19 Image of Waterloo Collegiate Institute portable classrooms in Waterloo, ON

Fig. 1.20 Expansion patterns of schools after 1970

1.3 Summarizing the Key Issues

The construction of public schools across Canada has all but halted after the 1970s, despite a continued increase in population. This has led to a crisis in Ontario's public education. Today, schools are overcrowded and in desperate need of repairs. In response to the situation, the Financial Accountability Office of Ontario (FAO) released the Ontario School Boards report on December 17, 2024, assessing building conditions, student capacity, and capital budgeting.[40] In this report, the OME proposes a ten-year solution plan that involves the use of portable classrooms, redrawing physical school boundaries or catchment areas, and the rapid construction of new schools according to a standardized template. While the OME may view these proposals as a solution to the crisis, the thesis argues that the proposals are only short-term fixes, reflecting a broader disinvestment in Ontario's public education. Thus, the first key issue addressed in this thesis is that the Ministry of Education is allocating funding to quick fixes rather than investing in innovative and effective long-term solutions.

The next key issue explored is the historical lack of provincial funding and general research devoted to secondary education, both in pedagogy and in architectural design. The neglect is concerning since adolescence is a pivotal stage marked by significant biological, cognitive, psychological, and emotional development.[41] While students at this stage are forming a strong sense of agency as they explore their identity and experiment with different approaches to learning, they still depend on well-designed, supportive, and safe environments.[42] Instead of nurturing this growth by creating spaces that encourage risk-taking and authentic learning, many secondary schools are confined to large, suburban campuses that isolate students from the broader community. American historian and philosopher Hannah Arendt observed that society's persistent wariness toward youth limits their exposure to diverse environments, reinforcing a narrow view of education that favours early learning: "[...] the child requires special protection and care so that nothing destructive may happen to him from the world. But the world, too, needs protection to keep it from being overrun and destroyed by the onslaught of the new that burst upon it with each new generation."[43] Consequently, pedagogical research primarily focuses on early education, while architectural innovations for secondary schools remain limited. Addressing apparent gaps and challenges, this thesis aims to redirect attention to secondary schools by exploring strategies that can better serve this overlooked population.

Teenagers exist in a liminal stage between childhood and adulthood, often difficult to connect with or categorize, and as a result, they are frequently left out of societal consideration.

40 "Ontario School Boards: School Building Condition, Student Capacity and Capital Budgeting," 2024, https://fao-on.org/en/report/school-boards-capital-2024/.

41 Engineering National Academies of Sciences et al., "Adolescent Development," in *The Promise of Adolescence: Realizing Opportunity for All Youth* (National Academies Press (US), 2019), https://www.ncbi.nlm.nih.gov/books/NBK545476/.

42 National Academies of Sciences et al., "Adolescent Development."

43 Hannah Arendt, *Between Past and Future: Six Exercises in Political Thought* (The Viking Press, 1961), 186.

The central issue examined in this thesis is that post-war classrooms and school buildings, as they currently exist, are unable to support contemporary pedagogical models and the needs of 21st-century learners. Nationwide, many modern schools have been constructed to accommodate evolving student needs. For instance, in Vancouver, British Columbia, architects have begun utilizing learning hubs rather than traditional classrooms as a standard for designing secondary schools.[44] However, British Columbia has benefited from substantial funding, driven in part by seismic standards that mandate school upgrades, while Ontario has neither the momentum nor the budget to modernize its facilities.

The urgency of the climate crisis, and our built world being responsible for over 40% of global carbon emissions, demonstrates that demolishing and rebuilding is both wasteful and unsustainable.[45] Consequently, the final issue addressed is the lack of initiative to repurpose and upgrade existing facilities to meet contemporary educational needs. As architect and preservationist Carl Elefante famously stated, "The greenest building is one that is already built."[46] Ontario's secondary schools require solutions that rethink existing educational spaces to better support contemporary curriculum and the broader community.

Hosting 16 secondary schools, with 9 constructed in the post-war era, the Waterloo Region District School Board (WRDSB) is just one of many school boards struggling in Ontario. Despite being the seventh-largest school board in the province, with an enrolment of 64,153 students, it faces significant challenges due to having the fifth-lowest per-student funding.[47] Simultaneously, over the last fifty years, the Waterloo Region has built only three new public secondary schools; a trend common throughout Canada.[48] My lived experience in the Waterloo Region, particularly noticing a disconnect between secondary students and the broader community, further reinforced the rationale, and my interest in, focusing on the WRDSB. The thesis research examines post-war secondary schools in the Waterloo Region. By addressing the overcrowding crisis, historical neglect of secondary education, and tendency to overlook the potential to improve, not demolish, existing schools in Ontario.

44 "Argyle Secondary School," *KMBR Architects*, accessed March 9, 2025, https://www.kmbr.com/portfolio/argyle-secondary-school/.

45 "The Built Environment Is the Single Largest Contributor of CO_2 Emissions. What Can Be Done about It?," World Economic Forum, https://www.weforum.org/videos/345121-over-the-last-100-years/.

46 Carle Elefante, *The Greenest Building Is... One That Is Already Built.*, Forum Journal (2012).

47 "Ontario School Boards: Enrolment, Finances and Student Outcomes - Financial Accountability Office of Ontario," *Financial Accountability Office of Ontario*, 2023, https://fao-on.org/en/report/fa22207schoolboards/.

48 Watson & Associates Economists Ltd., *Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review* (Mississauga, ON, 2015).

1.4 Thesis Overview

Throughout this thesis, the terms 'high school' and 'secondary education' are used interchangeably to refer to grades 9 through 12.

The thesis proposal seeks to develop a framework for reimagining secondary education by revitalizing existing post-war secondary schools, with a focus on the Waterloo Region in Ontario. This research aims to support modern educational practices that embrace 21st-century learning, diverse learning styles, and community-based education. To guide this effort, three interconnected scales are examined: the classroom, the school building, and the surrounding urban context. Instead of relying solely on School Boards and the Ontario Ministry of Education (OME) to drive innovative change for the built environments of secondary schools, this proposal also targets the Waterloo City Council, as the community's representative, to inspire aspirational transformation. While the OME's assessments of schools tend to emphasize metrics, a more meaningful approach would center the lived experiences of students and their communities.

The guiding thesis research questions are: How can post-war secondary schools, originally designed under outdated educational philosophies, be adapted for 21st-century learning? In what ways can spatial design foster a sense of belonging, engagement, and well-being among students? How can the schools establish a closer connection with their surrounding communities? Developed as a set of guidelines, the research serves as a stepping stone toward a broader question: How can post-war schools across Canada be preserved and revitalized to support inclusive, equitable, and accessible education for all?

The research objectives are to assess the current state and future vision of public education in Ontario, understand the evolving needs of 21st-century learners, and explore how secondary schools as buildings can better support both student development and community well-being. In the final section, the research culminates in a set of design guidelines that outline strategies for renewing existing school buildings into inclusive, adaptable, and community-oriented environments that reflect contemporary educational values. To systematically address these key issues, objectives, and research questions, the thesis is organized into three main sections:

1. Addressing the Public Education Crisis:

The research begins with an examination of the current conditions of Ontario's public education infrastructure. This section contextualizes the overcrowding crisis and details the proposed solutions by Ontario's Ministry of Education. A critical analysis of this report focuses on current funding patterns towards the secondary school typology. For a more focused analysis, the study then turns to the Waterloo Region District School Board (WRDSB), exploring its current challenges as a representative of broader trends across Ontario. Personal site visits to selected Waterloo region secondary schools are documented in a case study format to support this investigation. The section concludes by identifying gaps in the Ministry's proposed solutions.

2. Responding to Shifting Educational Needs:

This section examines current pedagogical models that emphasize the unique types of learners, 21st-century education, and community-based learning, detailing how these theories are being integrated into Ontario's curriculum today as well as in contemporary school design. The study begins by highlighting the secondary student experience, outlining some of the key pressures one may face during adolescence. It then explores the range of spaces needed to support innovative learning environments, using case studies of contemporary secondary schools. This analysis is organized across three scales: the classroom, the school building, and the surrounding community. A central focus is on identifying strategies to integrate schools with their broader context in a more meaningful way, enhancing community engagement and fostering a strong sense of belonging among students. This analysis creates a framework for the spatial components envisioned in the final design guidebook.

21st-century learning refers to an educational approach that goes beyond traditional memorization, focusing on problem-solving, adaptability, and the ability to apply knowledge to real-world situations. The aim is to integrate content with the essential 4C skills: critical thinking, communication, collaboration, and creativity.[4]

4 Ken Kay, "The Seven Steps to Becoming a 21st Century School or District," Edutopia, https://www.edutopia.org/blog/21st-century-leadership-overview-ken-kay.

3. A Design Guidebook for Reimagining Schools:

The final section begins with a set of design principles tailored towards renewing post-war secondary schools through retrofitting. With the design principles in mind, the section transitions to an in-depth analysis of a specific post-war secondary school in the Waterloo Region to ground this research in a real site illustrating tangible design interventions. The secondary school serves as a case study for applying the proposed design principles. This portion of the thesis is presented as a general design guideline, offering architects, designers, city council members, school boards, and community members actionable strategies for implementing these principles in existing public secondary schools. The guidebook begins by examining the classroom and building scales, integrating key insights from case studies and contemporary educational paradigms. At the community scale, it addresses the issue of overcrowding by exploring opportunities for learning to take place off campus, reimagining the standard 8 am to 3 pm schedule and reducing the need to confine all students to the school property. The study also outlines potential community-support programs that could be integrated into the secondary school campus, reinforcing the school's role as a community hub.

This thesis argues that through targeted, innovative design interventions, existing post-war secondary schools can be transformed into dynamic, adaptable learning environments that align with modern educational philosophies. More broadly, the thesis positions school renewal as an example of how thoughtful architectural adaptations can create a more engaging, sustainable, and healthier environments that respond to individual and community needs.

2.0 ADDRESSING THE PUBLIC EDUCATION CRISIS

2.1 We Have Outgrown Our Schools

Public education across Canada is facing a growing crisis, one rooted in the long-standing neglect of a foreseeable issue. In the post-war era, Canada was in the stage of defining its national identity.[1] A key part of this effort involved investing in public social programs to improve the quality of life for citizens.[2] Public schools were at the heart of this vision. The government saw education as the foundation of a prosperous economy and was committed to providing every child with access to a centrally located school.[3] However, this ambitious vision was rapidly executed. The result was the mass production of "copy-paste" school floor plans, the recruitment of underprepared teachers, and a curriculum designed to produce disciplined, industry-ready citizens rather than well-rounded individuals.[4]

"Quality education" needs to go beyond space and size considerations such as simply providing a desk and chair for every student. To me, quality education means creating an environment where each student's unique needs are considered and met, and where they leave equipped with the skills and knowledge necessary to pursue their own future aspirations

Today, Ontario faces a parallel challenge: as the population grows, the province struggles to provide quality education for every student. The government has anticipated this growth by investing in infrastructure and building high-density, mixed-use developments; however, these efforts have dominantly focused on the residential and commercial sectors. The outcome has been economic growth and urban densification, but at the expense of neglecting a critical public need: education. With a steady increase in population comes a growing number of children, yet the public education system, being a non-profit program reliant on social funding, has seen little substantial investment since the school building boom period pre-1970s. Although suburban communities have transformed from predominantly low-rise neighbourhoods into mid and high-rise developments, school sites have remained static and untouched behind fences. This neglect is especially evident in secondary education, where aging infrastructure and outdated models fail to meet the needs of today's teenagers in an increasingly complex and competitive world.

Policies enacted by the Ontario Ministry of Education (OME) have only aggravated the challenge of securing sufficient funding for school boards to construct additional schools in overcrowded districts. Since the 1980s, many post-war schools have addressed increasing enrollment by simply expanding existing facilities, often by adding classroom additions or placing portables on site rather than constructing new buildings. As stated by the OME, school boards have been encouraged to "increase the utilization of existing school facilities by implementing funding polices and practices designed to reward the school boards which use their facilities most effectively."[5] Hence, schools with the largest enrollment, often with

1 Jennifer Wallner, *Learning to School: Federalism and Public Schooling in Canada* (University of Toronto Press, 2014), 151–52, https://doi.org/10.3138/9781442669284.

2 Wallner, 152.

3 Wallner, 152.

4 Charles E. Phillips, "Education in Canada, 1939-46," Cambridge University Press, History of Education Journal, 3, no. 1 (1951): 7.

5 Educational Consulting Services (Canada) Inc. and RJR Educational Services Inc., "Analysis of Capital Funding for School Facilities Final Report" (Ontario Ministry of Education and Training, September 1996).

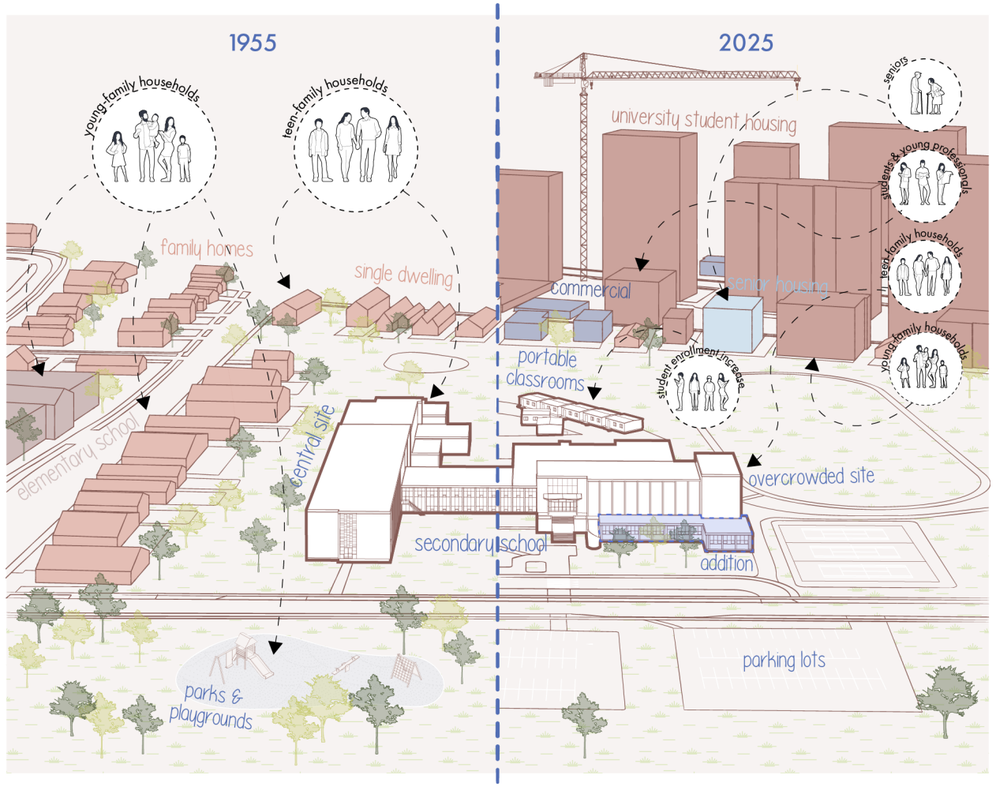


Fig. 2.1 The development of suburban communities around static secondary school sites

Although surrounding communities have evolved, grown, diversified, and expanded, the school site itself has remained static

portable classrooms, receive the most amount of funding. The OME has placed school districts in an ongoing competition to demonstrate that their conditions are comparatively worse to secure the limited financial support needed for their buildings.

The continued efforts to reduce provincial spending on school infrastructure have left many schools in Ontario overcrowded and outdated. In the 2023-24 school year, the Financial Accountability Office of Ontario (FAO) counted 150,881 overcapacity students.[6] With the average annual student growth rate of 0.4 percent, the capacity pressures are projected to increase to 240,878 students by 2033-34.[7] The increasing capacity pressures enforce the need for investment in public school buildings. However, replicating the rapid, post-war model of "copy-paste" school construction or depending on temporary solutions are no longer viable options. Rather, there is a demand for the OME to implement innovative, sustainable solutions that will address both current and future needs.

6 "Ontario School Boards: School Building Condition, Student Capacity and Capital Budgeting," 2024, 3, https://fao-on.org/en/report/school-boards-capital-2024/.

7 "Ontario School Boards," 3.

2.2 The "Temporary" Solutions

> *Equity in education requires financial equity. Although the very complex issue of education funding in general was not a specific part of our mandate, we are convinced that our goal of providing an excellent education for all learners cannot become a reality unless the way education is funded in Ontario is changed radically.*[8]
>
> — Ontario Royal Commission on Learning, 1994.

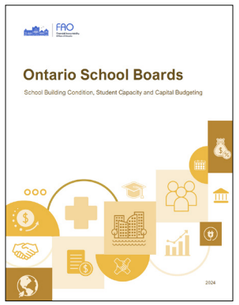


Fig. 2.2 Ontario School Boards Report released December, 2024

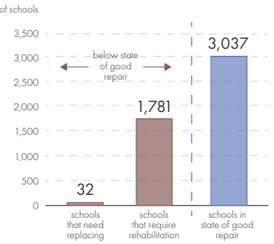


Fig. 2.3 FAO estimate of number of schools by condition rating as of March 31, 2024

Other school systems included in the report are the Catholic School System and French School Systems. With the largest enrolment and number of schools, this thesis is focused on the English Public Schools.

The release of the *Ontario School Boards: School Building Condition, Student Capacity and Capital Budgeting* report on December 17th, 2024, confirms an ongoing disinvestment in Ontario's public education system.[9] Prepared by the Financial Accountability Office of Ontario (FAO) at the request of a Member of Provincial Parliament, the report assesses the condition of school buildings across Ontario's 72 school boards, estimating the costs required to maintain them in good repair.[10] The report also compares each school's capacity with student enrolment to understand capacity pressures.[11] Cost estimates for school repairs and expansions over the next decade, along with recommended funding strategies, are presented for the OME and the district school boards.[12]

The report assessed all 4,850 publicly funded school facilities in Ontario, including 897 secondary schools. The findings revealed that 37.4% of these buildings do not meet the good repair standard, with 32 schools in need of complete replacement.[13] The FAO has projected that achieving a state of good repair for all school buildings will require $21.7 billion, along with ongoing maintenance costs through 2033-34.[14] The English Public school system is expected to require the largest share of this funding, indicating that it is in worse condition than the other systems.[15]

On the issue of capacity pressures, the FAO projects enrolment will increase by 89,996 students over the next decade, from 2.05 million in 2023–24 to 2.14 million in 2033–34.[16] With 150,881 students already over capacity, the predicted outcome is a total capacity pressure of 240,878 students by 2033-34.[17] After accounting for potential mitigations, such as adjustments to catchment areas, the FAO estimates that creating new school spaces for the overload will cost $9.8 billion.[18]

8 Ontario Royal Commission on Learning, "For the Love of Learning," vol. 4 (Toronto, 1994), 126.
9 "Ontario School Boards," 2024.
10 "Ontario School Boards," 5.
11 "Ontario School Boards," 5.
12 "Ontario School Boards," 5.
13 "Ontario School Boards," 12.
14 "Ontario School Boards," 13.
15 "Ontario School Boards," 13.
16 "Ontario School Boards," 20.
17 "Ontario School Boards," 20.
18 "Ontario School Boards," 20.

In total, Ontario will require $31.5 billion to address both the repair and capacity needs.[19] However, only $18.7 billion has been allocated in the provinces' budget: $12.5 billion for repairs and maintenance and $6.2 billion for addressing capacity pressures.[20] If funding remains at this level, the FAO anticipates that the percentage of buildings not in good repair will rise from 37.4% to 74.6% by the 2033-34 school year, resulting in a backlog escalating from $6.5 billion to $22.1 billion by that same year.[21]

With a $12.7 billion funding shortfall, the report suggests that Ontario's current funding strategies and future vision for its schools are problematic.[22] Rather than articulating a proactive approach, the proposed measures reveal reactive actions to educational infrastructure. Specifically, the report outlines three main actions to address capacity pressures: 1. a continued reliance on portable classrooms, 2. boundary reviews, and 3. the construction of new schools using standardized templates.[23] In extreme cases, while not formally suggested in the report, some school districts have closed under-utilized schools to reallocate funding more effectively, and others have considered adjusting student schedules to manage capacity constraints.[24] The following section provides a critical assessment of these proposed plans of action.

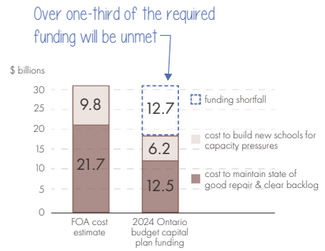


Fig. 2.4 FAO estimate of the 2024 Ontario Budget 10-year capital plan funding shortfall for school buildings, $ billions

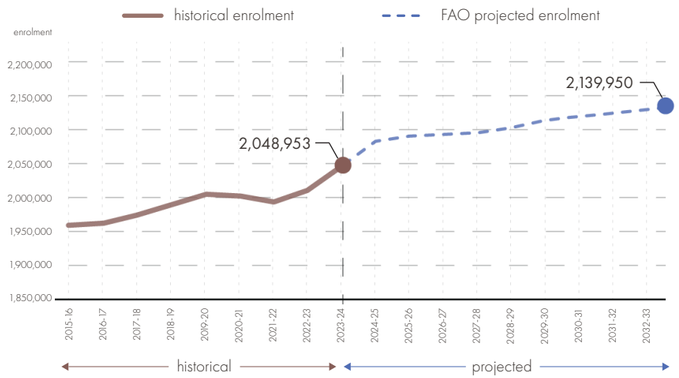
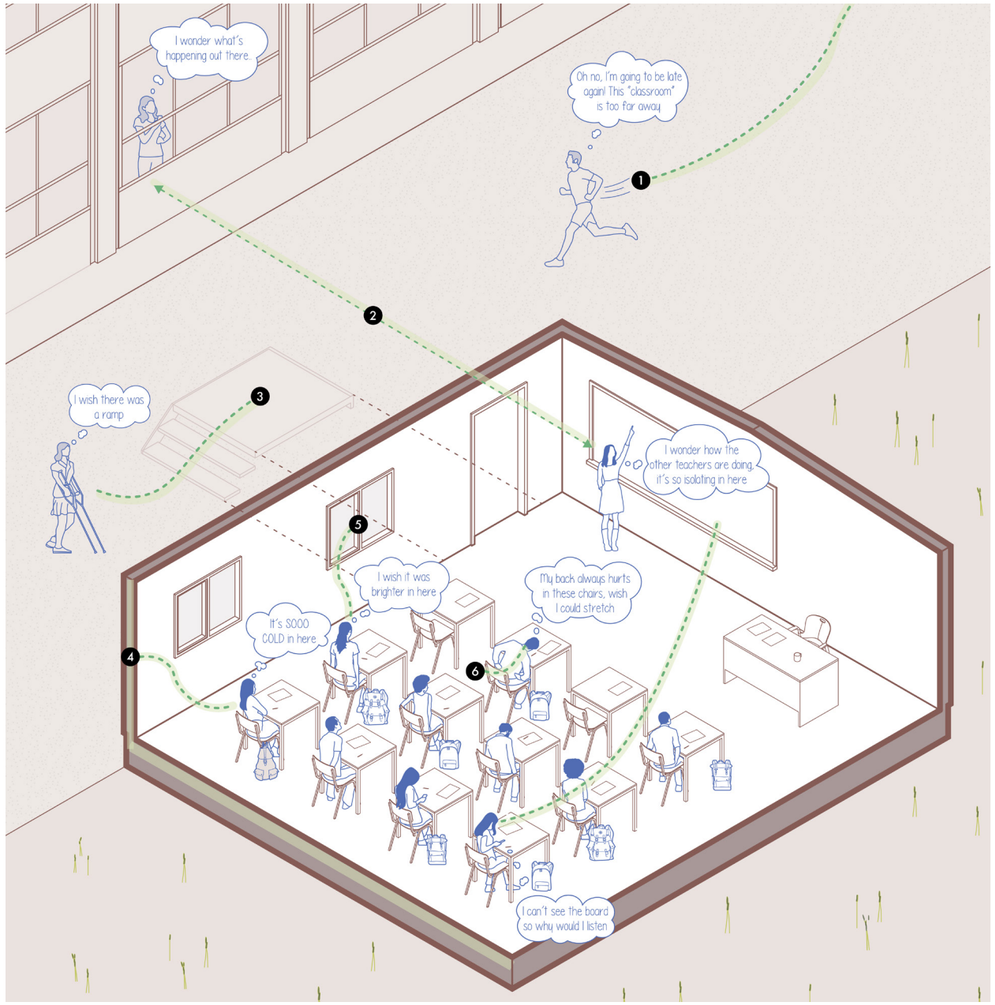


Fig. 2.5 FAO projection for total school board enrolment to 2033-34

"State of good repair" means that the school building requires rehabilitation (repairs). "Below a state of good repair" means the school building should be replaced with a new school (rebuilt).[5]

5 Ontario School Boards: School Building Condition, Student Capacity and Capital Budgeting (2024), 1, https://fao-on.org/en/report/school-boards-capital-2024/.

19 "Ontario School Boards," 23.
20 "Ontario School Boards," 23.
21 "Ontario School Boards," 23.
22 "Ontario School Boards," 23.
23 "Ontario School Boards," 24.
24 Ben Miljure, "Surrey School Survey Raises Eyebrows with Novel Ideas to Combat Overcrowding," CTVNews, November 22, 2023, https://www.ctvnews.ca/vancouver/article/surrey-school-survey-raises-eyebrows-with-novel-ideas-to-combat-overcrowding/.



1 DISTANCE BARRIER
- Long routes to classrooms result in more late students and delayed class start times

2 PHYSICAL DETACHMENT
- Students and teachers isolated into portables begin to loose a sense of belonging in the school

3 INACCESSIBLE FEATURES
- Portables are typically raised with stairs, making it an inaccessible access point
- Small space between desks further the challenge

4 POOR INSULATION
- Wall assemblies have very little insulation, making them less effective at retaining heat
- With the raised floor, six sides of the building (top, four sides, bottom) are exposed to the outdoors

5 MINIMAL WINDOWS
- The lack of daylight and minimal artificial lighting results in a very dark and inspiring environment

6 RESTRICTIVE EQUIPMENT
- Uncomfortable desks and chairs makes focusing and learning difficult
- Inflexible furniture arrangements in small spaces

7 TEACHER-CENTRIC LAYOUT
- The restrictive layout and equipment encourages teach centered learning
- Individual needs of students are overlooked, resulting in students not engaging in learning or paying attention

Fig. 2.6 Diagram illustrating the student experience in portable classrooms as influenced by physical conditions

1. Portable Classrooms:

With their flexibility and relatively low costs, portable classrooms have been used to accommodate growing student populations in school districts since the early 20th century.[25] In the report, the FAO notes that "if enrolment is above the permanent classroom capacity for only part of the long-term projection, then the capacity pressure is deemed to be temporary and portables are recommended as the solution."[26] While the report acknowledges that portable classrooms are not intended as a permanent solution, current trends suggest otherwise. In the 2023–24 school year, 112,274 of the 150,881 overcapacity students were accommodated in 4,893 portable classrooms. By 2033–34, despite a projected increase in capacity needs, 68,299 students are still expected to rely on 2,901 portables due to funding shortfalls. According to the OME, the construction of a new schools and additional spaces to address capacity pressures should take no more than four years, meaning portable classrooms should only be utilized shortly while permanent space is being constructed.[27] After this timeframe, it becomes a form of long-term dependency.[28] By supporting continued reliance on portables over the next decade, the FAO report effectively signals that they are no longer being treated as a temporary measure.

In the case of the Surrey School District in BC, one school was finally expanded enough to eliminate the need for portable classrooms. However, it was too expensive to remove the portable classrooms from the site. Now, they sit vacant, occupying valuable space.[6]

[6] "Surrey School District Faces Expensive Portable Removal Costs - BC | Globalnews.Ca," Global News, accessed October 4, 2025, https://globalnews.ca/news/11389799/surrey-school-district-expensive-portable-removal-costs/.

While portable classrooms may offer a cost-effective, short-term solution to overcapacity, long-term use can significantly impact the quality of education. The structures are poorly insulated, making it difficult to maintain comfortable room temperatures. They often suffer from poor air quality due to inadequate air handling, are typically inaccessible because of raised foundations, and remain physically detached from the main school building.[29] Together, these factors contribute to a diminished learning environment. Functioning similarly to the outdated single-room schoolhouse typology, portable classrooms restrict movement and flexibility. The limitations reinforce a teacher-centred model and hinder opportunities for collaborative or student-centred learning. As separate buildings, portable classrooms cannot replicate the social experience of being part of a school community.[30] Students and teachers build a sense of belonging through shared routines; moving through hallways, visiting common spaces, and both formal and informal interactions with peers and staff across various environments. When learners are relegated to isolated portables, these connections are weakened, creating a sense of exclusion from the broader school community.[31] At the same time, portables can only address classroom needs, leaving shared spaces such as gyms, libraries, cafeterias, and bathrooms overcrowded and under strain.[32]

While in middle school, I recall rushing into a portable classroom during a rain storm--soaked from head to toe. I realized that the experience was uncomfortable for everyone, including the shivering teacher. The already poorly heated space made for a cold environment for the duration of the class. Unsurprisingly, no one was able to focus!

25 Augusto Riveros, "The Overreliance on Portable Classrooms in Ontario Schools: New Evidence for the Study of Austerity and Disinvestment in Canadian Public Education," *Canadian Journal of Education/Revue Canadienne de l'éducation*, September 6, 2023, 571, https://doi.org/10.53967/cje-rce.5909.

26 "Ontario School Boards," 2024, 24.

27 "Ontario Builds: Education | Ontario.Ca," accessed April 9, 2025, http://www.ontario.ca/page/building-ontario-education.

28 Riveros, "The Overreliance on Portable Classrooms in Ontario Schools," 580.

29 Riveros, 572.

30 Riveros, 578.

31 David Branham, "The Wise Man Builds His House Upon the Rock: The Effects of Inadequate School Building Infrastructure on Student Attendance*," *Social Science Quarterly* 85, no. 5 (December 2004): 1117, https://doi.org/10.1111/j.0038-4941.2004.00266.

32 Riveros, "The Overreliance on Portable Classrooms in Ontario Schools," 573.

Since the original boundary review of secondary schools in the WRDSB began in 2010, the boundaries of only three secondary schools have been adjusted. Despite extensive consultation, numerous meetings, and several proposed scenarios, only two boundary lines were ultimately changed

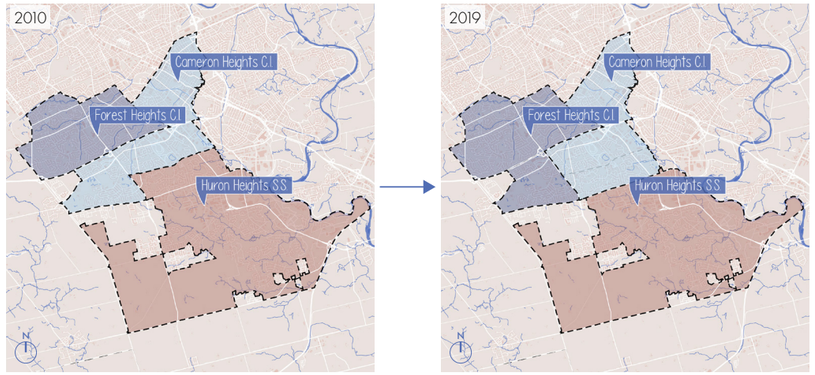


Fig. 2.7 Map showing the 2019 boundary changes to three secondary schools in Southwest Kitchener

2. Boundary Reviews:

Another suggested approach to addressing capacity pressures is evaluating school boundary lines.[33] Through adjustments to school catchment areas, the process considers opportunities to move students from overcapacity schools to undercapacity schools. In the review, numerous factors are considered, including: the historical and projected enrolment of the schools in question, proximity to and impact on neighbouring schools, facility statistics and conditions, program offerings, transportation requirements, temporary accommodation needs; future planning initiatives, geographic barriers, municipal planning projects, levels of community support and recent boundary changes.[34]

While regularly reviewing catchment areas is necessary for school boards to ensure alignment with the continuously changing urban context, the logistics of this process make it an unreliable and impractical solution for addressing the overcapacity crisis. These reviews are time-consuming, often requiring years of analysis, reporting, and community engagement. For example, the Waterloo Region District School Board (WRDSB) began the timely process of reviewing its secondary school boundaries in 2010. Since this initiation, it has taken over a decade to finalize and approve the redrawing of just three secondary school boundaries in Southwest Kitchener.[35] The process required many board decisions, public meetings, evaluations of public feedback, and numerous iterations of redrawing boundaries by planners.[36] Another factor is that strict catchment areas can negatively impact personal circumstances; a student might be assigned to a school that is nearer but poses challenges for a parent during drop-off. With valid reasons, parents and students deserve a voice in their school choice, while the OME ensures consistent quality across all schools.

33 "Ontario School Boards," 2024, 24.

34 "Ontario School Boards," 24.

35 Waterloo Region District School Board, "Southwest Kitchener Secondary Boundary Study – Final Report," 2019.

36 "2017-2027 Long-Term Accommodation Plan Southwest Kitchener and Kitchener Central-East" (Ontario: Waterloo Region District School Board, 2017).

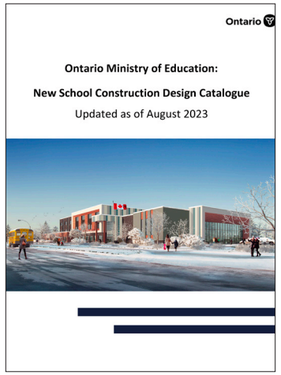


Fig. 2.8 Ontario Ministry of Education new school construction design catalogue, released August 2023

Design standardization presents opportunities to help save time and money by accelerating the design and approvals processes.

Consistent with the last round of Capital Priorities, school boards must submit a design either from the EDU Design Catalogue or another repeat design. Where a standardized design is not possible, the school board may be permitted to submit a new design.

— Ontario Ministry of Education, 2024

While this standardized approach may expedite project approval, it fails to address the distinct needs of each community or acknowledge the unique features that define a site. The catalogue schools also follow the traditional "cells and bells" typology

3. Building New Schools:

As a tangible solution to the overcrowding problem, the OME is allocating funding towards the construction of new schools.[37] To construct the schools quickly and efficiently, the report recommends using a standardized template outlining classroom sizes, budget allocations, finishes, and exterior enclosures for both elementary and secondary schools.[38] As stated by Jill Dunlop, Ontario Minister of Education, "Under our plan, schools are being built faster and more efficiently than ever before so more students have access to a place to learn and prepare for the jobs of tomorrow."[39]

Although building new schools is a much-needed solution, the process and approach adopted by the OME are troublesome. The reliance on a standardized template has historically resulted in copy-paste floor plans that limit critical thinking and restrict the incorporation of modern pedagogy. This approach resembles the post-war era, when Canada was focused on rapidly constructing schools. Historically, these schools quickly become outdated, failing to meet today's needs; the individuality of learners and the distinct identities of communities are often disregarded in the mass production of school buildings. While building new schools might be feasible for small-scale elementary institutions, it is less practical for secondary schools that require larger sites. For instance, in the Waterloo Region, Southwest Kitchener has been struggling to find a suitable location for a promised new secondary school due to the area's urban density.[40] At the same time, due to the high cost of constructing large schools, school boards frequently prioritize building multiple elementary schools while relying on portable classrooms to accommodate secondary students on existing sites.

Pedagogy refers to the "art, science, or profession of teaching." It encompasses teaching styles, ranging from teacher-centered to student-centered approaches, as well as methods of feedback and assessment. These approaches are constantly evolving and can be highly subjective.[7]

37 "Ontario School Boards," 2024, Appendix A.

38 "Building Our Schools, Building Our Future: A Report from the Expert Panel on Capital Standards" (Toronto: Expert Panel on Capital Standards, June 2010), 45.

39 "Ontario Making Historic $1.3 Billion Investment to Build and Expand More Schools," news.ontario.ca, accessed April 9, 2025, https://news.ontario.ca/en/release/1005655/ontario-making-historic-13-billion-investment-to-build-and-expand-more-schools.

40 "Public Board Redrawing Feeder School Boundary Maps in Kitchener to Alleviate Overcrowding," accessed March 9, 2025, https://www.ctvnews.ca/kitchener/article/public-board-redrawing-feeder-school-boundary-maps-in-kitchener-to-alleviate-overcrowding/.

7 Kathleen Glackin, "Pedagogy in Education: More Than Just a Buzzword," PowerSchool, October 20, 2021, https://www.powerschool.com/blog/pedagogy-in-education-more-than-just-a-buzzword/.

4. Band-Aid Additions and Repairs:

As a general rule, if the cost to repair an existing school is lower than it would be to construct a new school, OME recommends repairing the school and expanding it rather than building a new school.[41] The FAO estimates that the total current replacement value (CRV) of Ontario's school buildings stands at $123.3 billion as of March 31, 2024.[42] Hence, the value of the existing buildings is substantial and worth maintaining. However, 1,813 schools, 37.4%, of these schools are below the state of good repair target, with an estimated $21.7 billion needed for repairs and maintenance.[43]

As illustrated in Fig. 2.4, an estimated $21.7 billion is required for school repairs, yet only $12.5 billion is allocated in Ontario's Budget Plan. Schools will only be able to address about half of the identified repair needs, with funding directed primarily toward overcrowded schools. This shortfall will leave many facilities in deteriorating condition, leading to escalating repair costs in the future.

Funding for repairs and maintenance is often distributed incrementally, forcing school boards to address issues one at a time as resources become available. For instance, asbestos floor tile replacements are frequently completed classroom by classroom, an approach that is both inefficient and more costly when repairs are carried out in multiple phases over several years. Additionally, a significant portion of available funding is directed toward the replacement of aging mechanical systems, which are particularly expensive to maintain. Schools experiencing the most severe capacity pressures typically receive priority funding, leaving undercapacity schools with minimal resources; often insufficient to meet even basic needs. These repair efforts focus primarily on restoring buildings to a functional condition rather than evaluating whether they support contemporary pedagogies and student needs. As a result, investments tend to preserve outdated and inflexible facilities with "band-aid" fixes instead of enabling meaningful adaptation to modern educational requirements.

5. Other Proposed Solutions:

In certain circumstances, school boards have closed underutilized schools to reallocate funds toward those facing severe overcrowding. For example, a 2015 news report indicated that the OME was spending over $1 billion on more than 600 schools with low enrolment, leading to the closure of many facilities to prevent wasteful spending on underused space.[44] However, this approach overlooks the fact that these buildings remain durable assets that could potentially be repurposed to benefit the surrounding community, even if they no longer serve the school board's immediate needs. At the same time, school closures often displace students, historically affecting marginalized or low-income communities.[45] For example, in 2017, Ottawa school board trustees voted to close Rideau High School, a decision criticized for disproportionately impacting new immigrants, refugees, and Indigenous students who made up the majority of the school's population.[46]

In extreme cases, such as in Milton, students and teachers have been forced to use communal spaces like libraries and gyms as makeshift classrooms due to severe overcrowding.[47] Similarly, the crisis in Surrey, BC, has prompted proposals to split student schedules by extending school hours from 8 am to 6 pm on weekdays or even into the summer, with some sessions delivered online.[48] These corporate-style solutions, including staggered shifts and remote learning options, often overlook the critical importance of fostering a cohesive and supportive school community.

Summary:

Overall, the proposed plans of action funded to address capacity pressures and achieve a quantitative measure of "state of good repair" for school infrastructure equate to the creative deconstruction of public education in Ontario. Although the OME recognizes the current crisis and works toward affordable solutions, the *Ontario School Boards: School Building Condition, Student Capacity and Capital Budgeting* report reveals that efforts are misdirected. With chronic underfunding driving repair efforts toward quick fixes like portable classrooms, the quality of public education continues to deteriorate; the plan of action reinforces established trends that keep the public program static. As school buildings remain in disrepair and become less welcoming, an increasing number of parents and guardians are turning to private education, signalling growing concerns about the long-term sustainability and desirability of the public education system.[49] The OME must begin to consider alternative strategies that are not only cost-effective and sustainable but also equitable for every community. As noted by Tim McMullen, the first principal of Countesthorpe, an "open school" in Leicestershire, grounded in progressive education: "We have a chance to rethink the total process of learning within a school [...] This does not mean everything we do will be different from what has been done before, but it should mean that we do not automatically repeat an established practice without considering why."[50] In this spirit, Ontario must critically re-examine its funding priorities to determine whether resources can be allocated more effectively to achieve lasting improvements and deliver a higher quality of education.

41 "Building Our Schools, Building Our Future: A Report from the Expert Panel on Capital Standards," 43.

42 "Ontario School Boards," 2024, 8.

43 "Ontario School Boards," 13.

44 Keith Leslie-The Canadian Press, "600 Underutilized Schools in Ontario, but Not All Will Close: Sandals," CTVNews, January 29, 2015, https://www.ctvnews.ca/kitchener/article/600-underutilized-schools-in-ontario-but-not-all-will-close-sandals/.

45 Ranu Basu, "Negotiating Acts of Citizenship in an Era of Neoliberal Reform: The Game of School Closures," *International Journal of Urban and Regional Research* 31, no. 1 (March 2007): 109–27, https://doi.org/10.1111/j.1468-2427.2007.00709.

46 Jesse Butler, Ruth Kane, and Fiona Cooligan, "The Closure of Rideau High School: A Case Study in the Political Economy of Urban Education in Ontario," *Canadian Journal of Educational Administration and Policy*, no. 191 (2019): 83–105.

47 Melissa Fassel Dunn, "Overcrowding in Milton Schools Continues to Worsen," The Milton Scene, April 5, 2023, https://www.miltonscene.com/2023/04/overcrowding-in-milton-schools-continues-to-worsen/.

48 Akshay Kulkarni, "Surrey School District's Survey Seeking Solutions to Overcrowding Draws Outrage from Parents, Teachers," *CBC News*, November 24, 2023, https://www.cbc.ca/news/canada/british-columbia/surrey-bc-school-survey-1.7037257.

49 Riveros, "The Overreliance on Portable Classrooms in Ontario Schools," 576–77.

50 Tim McMullen, *The Countesthorpe Experience: The First Five Years*, ed. John Watts (London, 1977).

2.3 Assessing the Waterloo Region

> *Education became a priority in the face of the baby boom and the transforming economy. In 1952, there was only one public high school in Kitchener-Waterloo, by 1972, there were eight [...] The buildings were anchors in the transforming and expanding cities. They provided an open field for innovation in design, building technology and ideas of education.*[51]
>
> — Rick Haldenby, Professor, University of Waterloo School of Architecture.

I remember thinking on that drive to Bluevale Collegiate, "How do I even get to this building from the highway?" It seemed so untouchable, fenced off and isolated from both the busy surrounding highway and the nearby residential areas, as if deliberately set apart rather than integrated into its community.

The Waterloo Region District School Board (WRDSB), one of the 72 school boards in Ontario grappling with overcrowding and deteriorating facilities, is the central focus of this thesis. While I did not grow up in Ontario, I have resided in the Waterloo Region for nearly six years and have observed a disconnect between the secondary schools, which once formed the heart of their communities, and the community they were meant to serve. It appears while as the cities have changed and progressed, these schools have been overlooked. Despite living within walking distance of Glenview Park Secondary School in Cambridge, Ontario, I only recently came to notice it. The building is concealed by suburban homes and fenced off with no street presence, leaving its students disengaged from the community. I similarly recall the first time I saw Bluevale Collegiate Institute while driving on Conestoga Parkway in Waterloo, Ontario. The urban landscape struck me; the back of the brutalist school sat prominently on a hill in the background. The extensive field and fencing established a separation between the static school and the highway, making it seem isolated and nearly unreachable. These personal observations of disconnect, grounded by some initial research, guided my decision to focus on the WRDSB. The history, constraints, and projected statistics found while researching the WRDSB only justified the district selection.

The WRDSB comprises 16 secondary schools located in the urban areas of Kitchener, Waterloo, and Cambridge, along with the nearby townships of Wilmot, Woolwich, Wellesley, and North Dumfries.[52] Following World War II, the Waterloo Region, similar to much of North America, underwent significant population growth, prompting extensive infrastructure development to meet the needs of the expanding community.[53] During this time, the region embraced modernism with innovative energy, leveraging the skills of its local population.[54] Out of the 16 secondary schools in the WRDSB, 9 were built between 1955 and 1972.[55] Local architects Barnett & Rieder designed six of these schools, alongside numerous other modern design landmarks of various types.[56] The 1950s secondary schools, designed in a period supported by great economic growth, are true civic buildings proudly facing the public street to assert their entrances.[57] The classroom wings feature an industrial aesthetic, reflecting a period of post-war optimism and modernism.[58] Embracing population growth, the architects began drafting plans for expansions before the original construction was even finished.[59]

By the mid-1960s, a shift in educational priorities in Ontario began to influence design outcomes. While the façades remained as articulate and refined as other modern civic buildings, the interiors of schools underwent more subtle transformations. Architects were instructed to create larger floor plates to accommodate more students, incorporate central air conditioning, and reduce construction costs.[60] These new standards resulted in classrooms without windows. Gradually, the secondary schools, once cornerstones of the developing cities, became diminished in pride. The last secondary school designed by Rieder & Hymmen in 1972 slouches back from the street, partially obscured by a row of houses, with its entrance subdued.[61] As iterated, 1967 was Canada's "last good year."[62] It seemed the province became exhausted by designing secondary schools, and construction halted. With financial pressures, efforts transitioned from constructing proud civic structures to relying on additions and portable classrooms as schools surpassed capacity allowance. Since 1972, over fifty years ago, only three secondary schools have been constructed in the Waterloo Region despite ongoing population growth.[63]

Today, the WRDSB faces challenges of supporting quality education for every student with aging facilities, ongoing population growth, and limited funding.[64] These issues are not unique to the WRDSB; many school boards across Ontario face similar challenges. Specific strains within the WRDSB relate to the population patterns of families, which have changed significantly since the post-war period, when most of the current secondary schools were originally planned.[65] At the time, residential growth was anticipated to be concentrated in the urban centres of Waterloo, Cambridge and Kitchener.[66] As a result, several

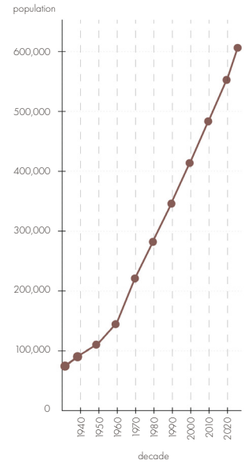


Fig. 2.9 Comparing population increase and secondary school construction in the Waterloo Region, 1940–2020

51 Rick Haldenby, *75 Years of Modern Architecture: Barnett & Rieder to Martin Simmons Sweers* (Kitchener, Ontario: Martin Simmons Sweers Architects, 2022), 1–2.

52 Watson & Associates Economists Ltd., "Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review" (Mississauga, ON, 2015).

53 Watson & Associates Economists Ltd., i.

54 Patrick Simmons, *75 Years of Modern Architecture: Barnett & Rieder to Martin Simmons Sweers*, ii.

55 Watson & Associates Economists Ltd., "Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review," i.

56 Haldenby, *75 Years of Modern Architecture: Barnett & Rieder to Martin Simmons Sweers*, 2.

57 Haldenby, 2.

58 Haldenby, 2.

59 Haldenby, 2.

60 Haldenby, 2.

61 Haldenby, 29.

62 Pierre Berton, *1967: The Last Good Year* (Toronto: Doubleday, 1997), 364.

63 Watson & Associates Economists Ltd., "Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review."

64 Watson & Associates Economists Ltd., i.

65 Watson & Associates Economists Ltd., i.

66 Watson & Associates Economists Ltd., i.

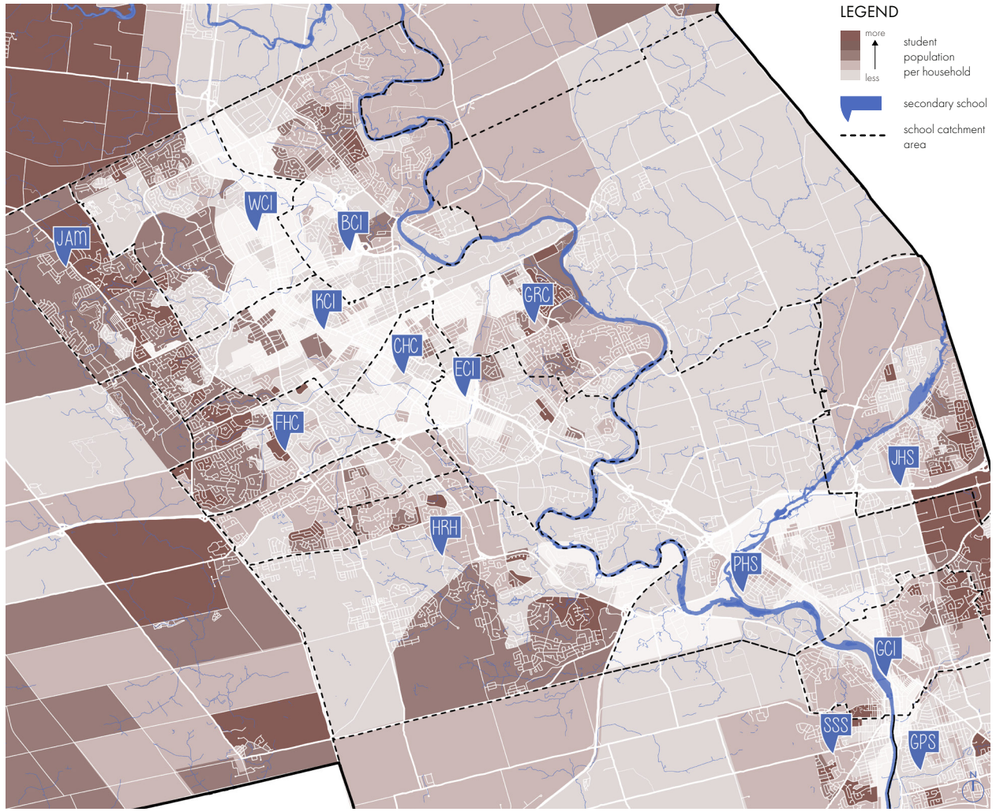


Fig. 2.10 Map of the WRDSB secondary student population per household and marked school locations

secondary schools were built quite close to each other. For example, three secondary schools, Waterloo Collegiate Institute (WCI), Bluevale Collegiate Institute (BCI) and Kitchener-Waterloo Collegiate (KCI), are all located in the urban core of Waterloo, placing many students within walking distance of two or more schools. [67] The population growth has now shifted to surrounding suburban and rural areas, which now have a higher percentage of secondary school-aged residents than the urban centres; a trend that is expected to continue.[68] As a consequence, schools located on the urban periphery, such as Huron Heights Secondary School (HRH) and Forest Heights Collegiate Institute (FHC), have become significantly overcrowded and rely heavily on portable classrooms. Huron Heights Secondary School, the newest secondary school in the region, constructed in 2006, already has 13 portables on site.[69]

67 Watson & Associates Economists Ltd., ii.

68 Watson & Associates Economists Ltd., 4.

69 Jeff Outhit Record Reporter Record Waterloo Region, "Kitchener's Huron Heights Secondary School Overcrowded," The Record, February 8, 2019, https://www.therecord.com/news/waterloo-region/kitcheners-huron-heights-secondary-school-overcrowded/article_ade127fd-f5de-5a8b-b866-646687a0a852.html.

Ongoing boundary reviews have been undertaken by the WRDSB and external consultants, originally initiated in 2010, to evaluate the region's school boundaries and provide recommendations for each of the 16 secondary schools.[70] Given that schools are geographically fixed, the WRDSB has made considerable efforts to adjust catchment areas to align with current and projected student populations, as well as each school's capacities. Since the original review began in 2010, the boundaries of only three secondary schools have been adjusted. This limited progress reflects the complex and timely nature of boundary reviews, which require multiple iterations, extensive community consultation, and formal approvals. Furthermore, the *Waterloo Region District School Board: Secondary Boundaries Updated Review* (2015) concluded that, along with recommended boundary adjustments, at least one new secondary school would be needed within five years in the southwest Kitchener area to support enrolment growth.[71] This promised new school still has not been built; the city council and the WRDSB have not been able to find—or agree on—a suitable site large enough to support a new secondary school.[72]

School Name	2021	2031
Bluevale (BCI)	47,000	53,000
Waterloo (WCI)	49,000	57,000
Sir John A. Mac. (JAM)	34,000	41,000
Kitchener-Waterloo (KCI)	49,000	59,000
Cameron Heights (CHC)	53,000	59,000
Forest Heights (FHC)	40,000	40,000
Eastwood (ECI)	35,000	40,000
Grand River (GRC)	39,000	47,000
Huron Heights (HRH)	58,000	75,000
Preston (PHS)	39,000	51,000
Galt (GCI)	30,000	34,000
Southwood (SSS)	26,000	29,000
Glenview Park (GPS)	41,000	49,000
Jacob Hespeler (JHS)	27,000	31,000
Elmira (EDS)	30,000	35,000
Waterloo-Oxford (WOD)	27,000	30,000
Region Total	623,000	729,000

Fig. 2.11 Waterloo Region population forecast (2021–2031) by secondary school

Future projections in *Ontario School Boards: School Building Condition, Student Capacity, and Capital Budgeting* indicate that pressures on the WRDSB will only intensify over the next decade.[73] Currently, the WRDSB is the 10th largest school board in Ontario, with an enrolment of 64,153 students, yet it receives the 4th lowest per-student funding in the province.[74] With enrolment projected to reach 69,492 students by 2033-34, the school district faces an average annual growth rate of 0.7%, greatly exceeding the provincial average of 0.4%.[75] In total, the WRDSB oversees 123 school buildings, 39.0% of which are currently overcrowded, and 44.7% fall below the "state of good repair" standard.[76] While these statistics are concerning, they offer only a limited, abstract view of the true condition of the schools. The numbers reveal that repairs and expansions are urgently needed and that funding must be allocated efficiently in both time and cost. What these statistics cannot capture is the lived, day-to-day experience within these facilities, where a student may spend approximately 15,000 hours over the course of twelve years.[77] The quality of these environments directly affects learning, well-being, and equity; factors that extend far beyond numerical assessments.

70 Watson & Associates Economists Ltd., "Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review," i.

71 Watson & Associates Economists Ltd., vii.

72 Jeff Pickel-CTV Kitchener, "Public Board Redrawing Feeder School Boundary Maps in Kitchener to Alleviate Overcrowding," CTVNews, November 19, 2019, https://www.ctvnews.ca/kitchener/article/public-board-redrawing-feeder-school-boundary-maps-in-kitchener-to-alleviate-overcrowding/.

73 "Ontario School Boards," 2024.

74 "Ontario School Boards: Enrolment, Finances and Student Outcomes - Financial Accountability Office of Ontario," *Financial Accountability Office of Ontario*, 2023, https://fao-on.org/en/report/fa22207schoolboards/.

75 "Ontario School Boards," 2024, 26.

76 "Ontario School Boards," 15.

77 Michael Rutter and Barbara Maughan, *Fifteen Thousand Hours: Secondary Schools and Their Effects on Children* (London: Paul Chapman Publishing, 1994), 1.

2.4 A Catalogue of Secondary Schools

Rather than relying solely on statistical data to evaluate the condition of WRDSB secondary schools, I chose to visit five post-war schools across the region to gain a firsthand understanding of the student experience. The secondary schools investigated were: 1. Glenview Park Secondary School, 2. Waterloo Collegiate Institute, 3. Southwood Secondary School, 4. Forest Heights Collegiate Institute, and 5. Bluevale Collegiate Institute. The following section presents a site catalogue that assesses both architectural challenges and opportunities at each location.

I began each assessment by examining the schools quantitatively, drawing on data from reports published by the Ontario Ministry of Education (OME). In this research, factors such as enrolment versus capacity, the number of portable classrooms, and overlapping boundary lines appeared to be the primary indicators of whether a school was considered "successful." Using this statistical evidence, the thesis assumes that if school boundaries are logical, the building is accessible, no major repairs are required, and enrolment is near capacity, the OME would deem the school "successful" and therefore minimize further funding allocations. To illustrate this, a set of criteria derived from those presumed by the OME is applied to evaluate how "successful" the Ministry might perceive each school to be. Alongside the numerical assessment, I conducted a secondary evaluation of the schools based the experience of walking through different spaces. This assessment extends beyond quantitative indicators through observational reflection and architectural analysis, seeking to imagine the day-to-day realities of the students who inhabit these spaces. Photographs and notes were taken during each site visit to document these observations and insights.

The photographs and field notes presented in this section highlight the experiential and spatial qualities of the schools, which are elements often overlooked in traditional assessments. This approach establishes a foundation for redefining what constitutes a "successful" secondary school. The site visit methodology aims to capture the qualitative experience of the school environments, providing a more holistic understanding than quantitative data alone can offer.

FCI (Facility Condition Index), is a score that measures a building's state of repair by dividing the cost of needed repairs by the building's current replacement value. Expressed as a percentage, a lower FCI indicates a better condition.[8]

[8] *Ontario School Boards*, 11.

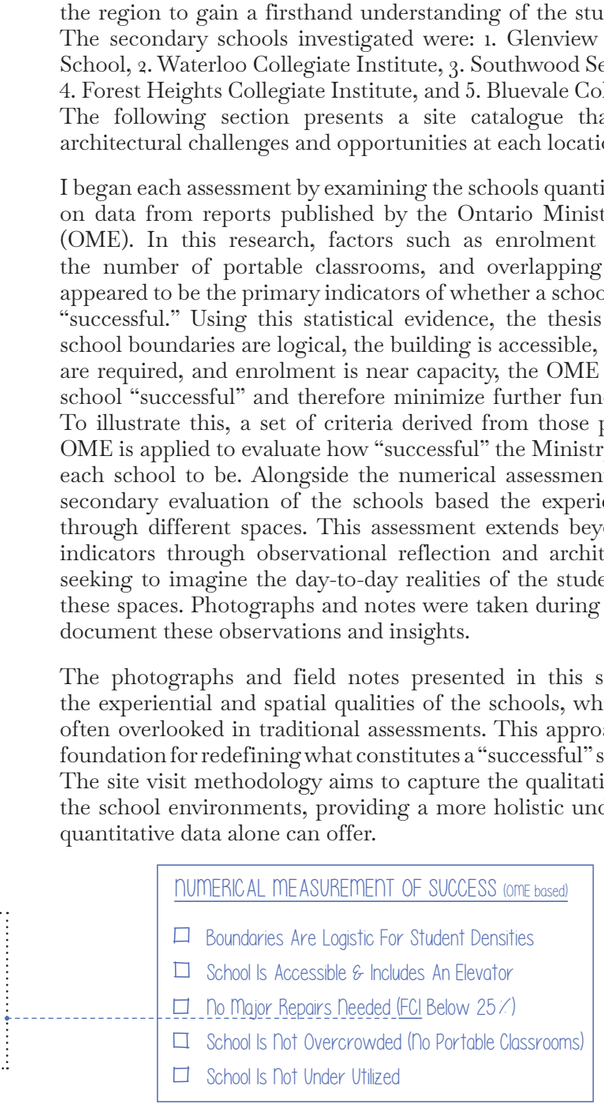


Fig. 2.12 Assumed OME checklist used to evaluate a school's perceived "success" through numerical conditions

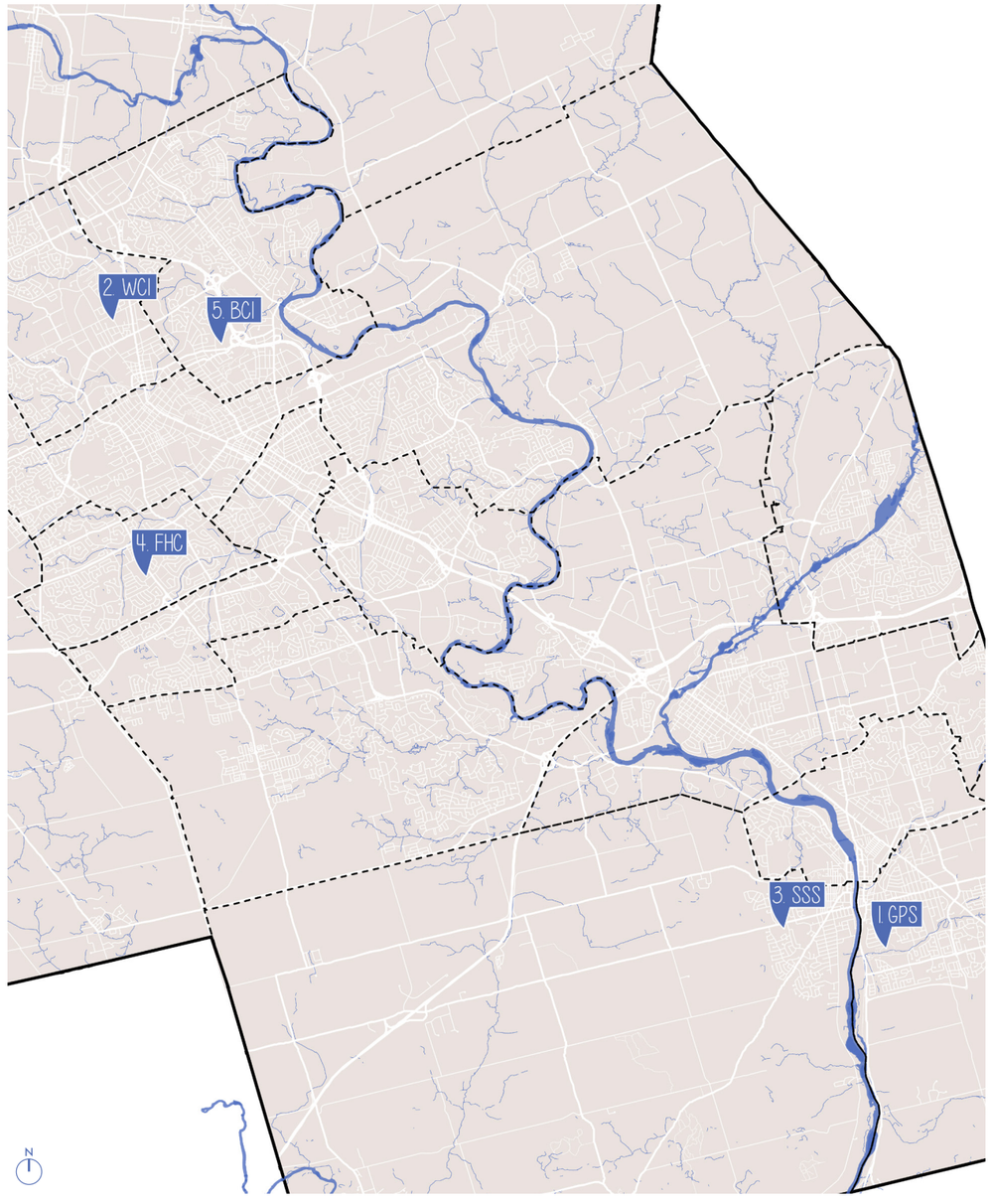
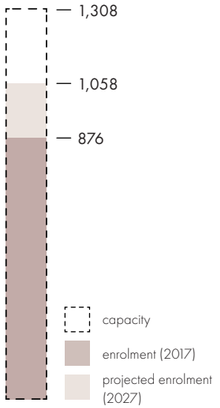


Fig. 2.13 Map of the Waterloo Region highlighting visited secondary schools

1957 GLENVIEW PARK SECONDARY SCHOOL

Site Size: **14.47ac**
Building Size: **15,750 sq.m.**
Facility Condition Index: **25%**

Student Capacity vs Enrolment:



NUMERICAL ASSESSMENT

- ☑ Boundaries Are Logistic
- ☑ School Is Accessible
- ☑ No Major Repairs Needed
- ☑ School Is Not Overcrowded
- ☐ School Is Not Under Utilized

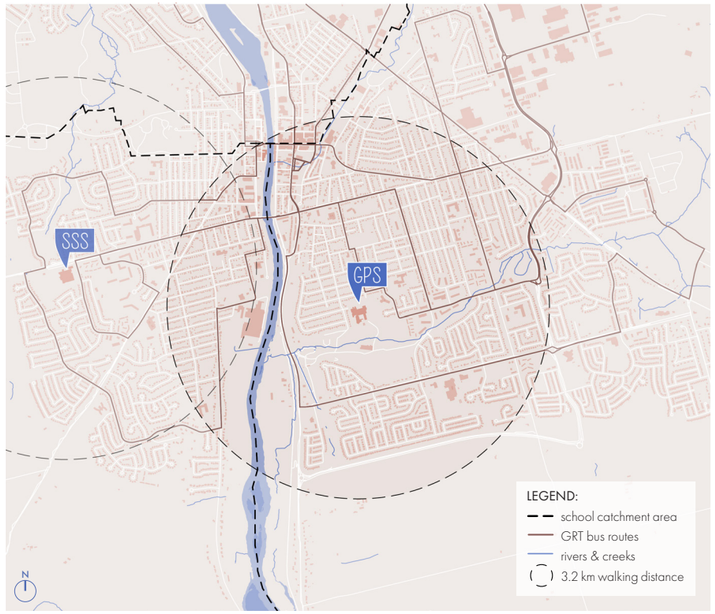


Fig. 2.14 Site map of Glenview Park Secondary School & student capacity vs enrollment data



Fig. 2.15 Photo demonstrating experience of arriving at Glenview Park Secondary School

POSITIVES CHALLENGES



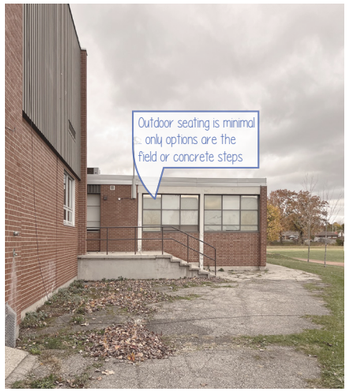










Fig. 2.16 Series of photos from site visit at Glenview Park Secondary School

PERSONAL NOTES:
(from site visits)

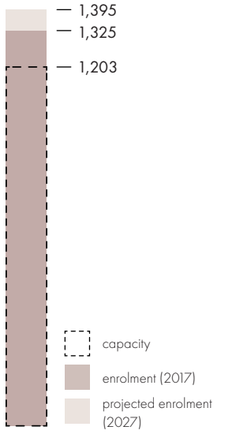
THE CHALLENGES:
- The building feels disconnected from the surrounding community, with little to no visibility from nearby streets.
- Continuous fencing blocks access to the adjacent park, reinforcing this sense of separation.
- It does not appear to be a building the community feels proud of or engaged with.
- The plain brick façade and uniform windows contribute to a lack of architectural identity.
- Multiple additions over time have resulted in confusing interior circulation.
- With the building now 75 years old, materials have accumulated in classrooms and storage areas, making the school feel crowded with "stuff."

THE POSITIVES:
- The greenhouse in the courtyard, where classes offer students credit for their involvement, provides meaningful opportunities for students to connect with nature.
- Ramps have been added on the ground floor to improve accessibility, and an elevator is planned for installation soon.
- Asbestos is being removed from classroom tiles on an as-needed basis.
- The building includes numerous specialized workshops that support hands-on elective courses.
- The area's population is slowly but steadily increasing, giving the school time to plan for expansion in a measured way.

1959 WATERLOO COLLEGIATE INSTITUTE

Site Size: 16.90 ac
Building Size: 16,625 sq.m.
Facility Condition Index: 31%
in the "worse" condition of assessed schools

Student Capacity vs Enrolment:



NUMERICAL ASSESSMENT

- ☐ Boundaries Are Logistic
- ☐ School Is Accessible
- ☐ No Major Repairs Needed
- ☐ School Is Not Overcrowded
- ☑ School Is Not Under Utilized

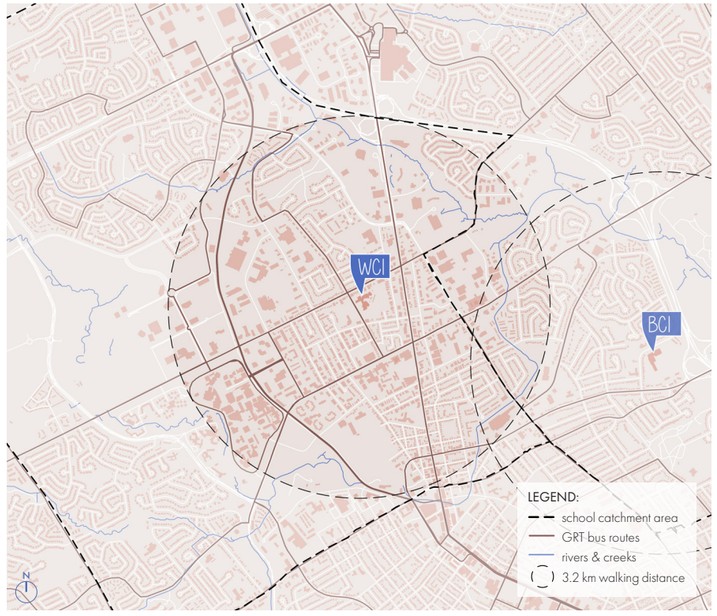


Fig. 2.17 Site map of Waterloo Collegiate Institute & student capacity vs enrollment data



Fig. 2.18 Photo demonstrating experience of arriving at Waterloo Collegiate Institute

POSITIVES CHALLENGES



Fig. 2.19 Series of photos from site visit at Waterloo Collegiate Institute

PERSONAL NOTES:
(from site visits)

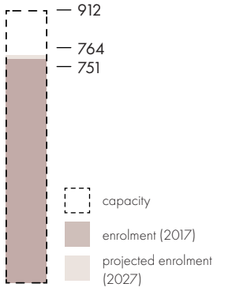
THE CHALLENGES:
- The school is located very close to Bluevale Collegiate Institute, resulting in an oversaturation of secondary schools in the area.
- The building is highly inaccessible, with no ramps or elevator. Its "half-level" configuration makes adding accessible features difficult in the current layout.
- The interior layout is confusing, in some areas, one must go down a set of stairs to reach spaces that are technically on upper levels.
- Approximately 40% of nearby housing is occupied by university students. Only 6% of the school's students live within the catchment area, and fewer than 30% are within walking distance.

THE POSITIVES:
- The building feels much brighter than other schools, with large classroom windows and vertical glazing at the ends of corridors.
- Vertical connections are created through basement windows that look down into the workshops from outside.
- Architectural features, such as the marble entrance and the circular glazed library, give the school a strong sense of character and identity.
- A strong sense of community is reinforced through painted murals and artwork throughout the building.
- Students and teachers actively adapt and repurpose spaces as needed. For example, part of the cafeteria was converted into a workout area, demonstrating creative reuse and a sense of agency.

1962 SOUTHWOOD SECONDARY SCHOOL

Site Size: **19.81 ac**
Building Size: **12,450 sq.m.**
Facility Condition Index: **30%**

Student Capacity vs Enrolment:



NUMERICAL ASSESSMENT

- ☑ Boundaries Are Logistic
- ☑ School Is Accessible
- ☑ No Major Repairs Needed
- ☑ School Is Not Overcrowded
- ☐ School Is Not Under Utilized

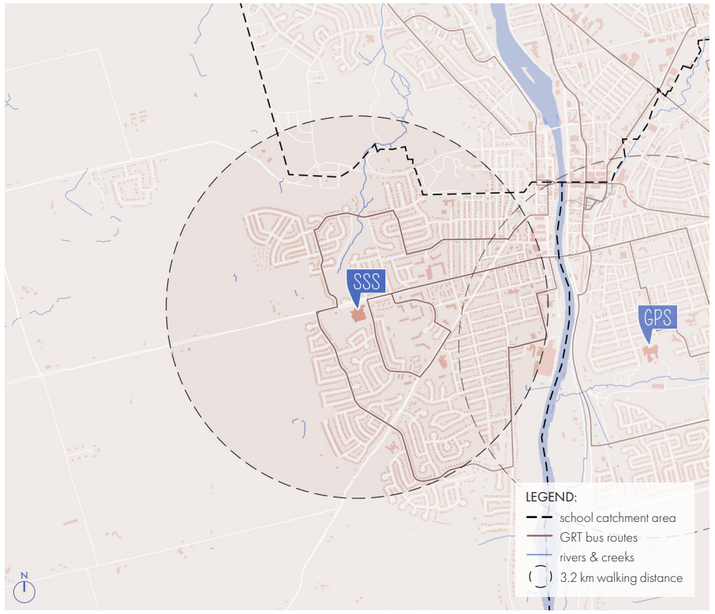


Fig. 2.20 Site map of Southwood Secondary School & student capacity vs enrollment data



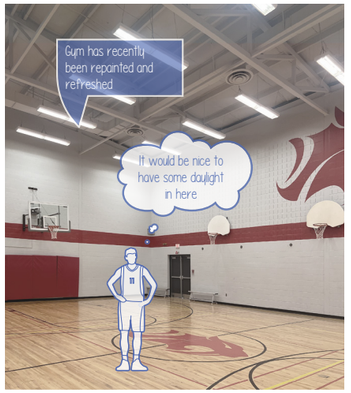
Fig. 2.21 Photo demonstrating experience of arriving at Southwood Secondary School

POSITIVES CHALLENGES











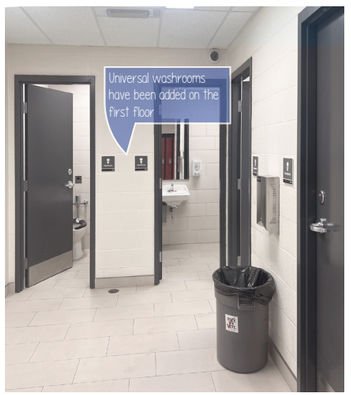


Fig. 2.22 Series of photos from site visit at Southwood Secondary School

PERSONAL NOTES:
(from site visits)

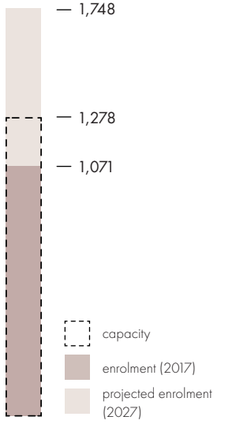
THE CHALLENGES:
- As a school with low enrolment and excess capacity, the building receives limited funding
- Upper classrooms often overheat due to outdated construction methods and the absence of a cooling system.
- When classrooms become too hot, they are simply closed, forcing teachers to relocate their classes elsewhere.
- The school's rural location makes it difficult to cultivate strong connections with a surrounding community.
- As a small school, social and informal gathering spaces are limited, even the front lobby is designed primarily as a circulation space rather than a place to greet.

THE POSITIVES:
- Additions over the years have created two interesting courtyards that students can use during breaks to spend time outdoors.
- Distinctive windows make the building feel unique and easily identifiable.
- When funding is available, the school has demonstrated its ability to make meaningful improvements, such as planting a school forest and adding universal washrooms, showing positive change over time.
- The surrounding community is relatively stable, and the school sits on a large site, creating opportunities to thoughtfully respond to community and student needs by adding new amenities (such as a community centre, athletic fields, or a daycare) on the existing property.

1964 FOREST HEIGHTS COLLEGIATE INSTITUTE

Site Size: **24.94 ac**
Building Size: **17,900 sq.m.**
Facility Condition Index: **22%**

Student Capacity vs Enrolment:



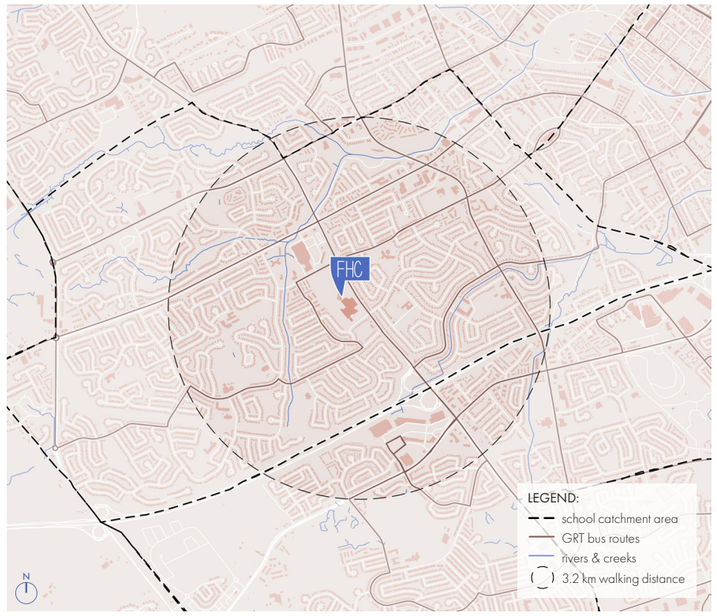


Fig. 2.23 Site map of Forest Heights Collegiate Institute & student capacity vs enrollment data

NUMERICAL ASSESSMENT

- [x] Boundaries Are Logistic
- [ ] School Is Accessible
- [x] No Major Repairs Needed
- [ ] School Is Not Overcrowded
- [x] School Is Not Under Utilized



Fig. 2.24 Photo demonstrating experience of arriving at Forest Heights Collegiate Institute

POSITIVES CHALLENGES











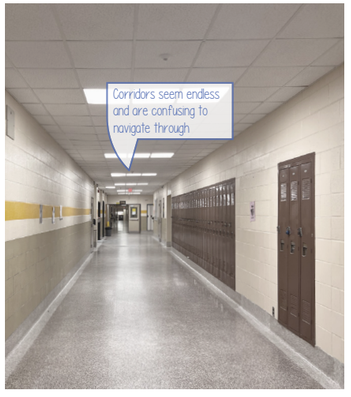


Fig. 2.25 Series of photos from site visit at Forest Heights Collegiate Institute

PERSONAL NOTES:
(from site visits)

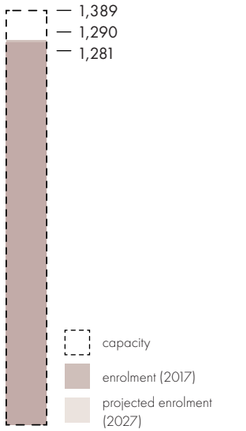
THE CHALLENGES:
- With the neighbouring school, Huron Heights (WRDSB's newest school, which already has 13 portables) being extremely overcrowded, the WRDSB has recently redrawn this school's boundaries, resulting in increased enrolment at Forest Heights.
- The site is very large, therefore the current plan appears to rely on adding portable classrooms to accommodate projected enrolment growth.
- According to discussions on Reddit, there are frequent student conflicts. The school population is already very large, and the sense of community feels weak, making it difficult for some students to feel like they fit in or for teachers to give each student the attention they need.
- The building layout is confusing, with numerous corridors that make navigation challenging.

THE POSITIVES:
- The school features distinctive architectural elements, including an arched canopy entrance and windows with extending columns, giving it a unique identity.
- The lobby is memorable, with stained-glass windows, marble floors, and ample space with benches for students to gather.
- The courtyards provide pleasant outdoor areas for students during breaks, and many classrooms overlook them, creating a strong visual and vertical connection.
- Centrally located within the community, the school includes a public library and pool, offering significant opportunities for community engagement.

1972 BLUEVALE COLLEGIATE INSTITUTE

Site Size: 19.92 ac
Building Size: 16,500 sq.m.
Facility Condition Index: 16%

Student Capacity vs Enrolment:



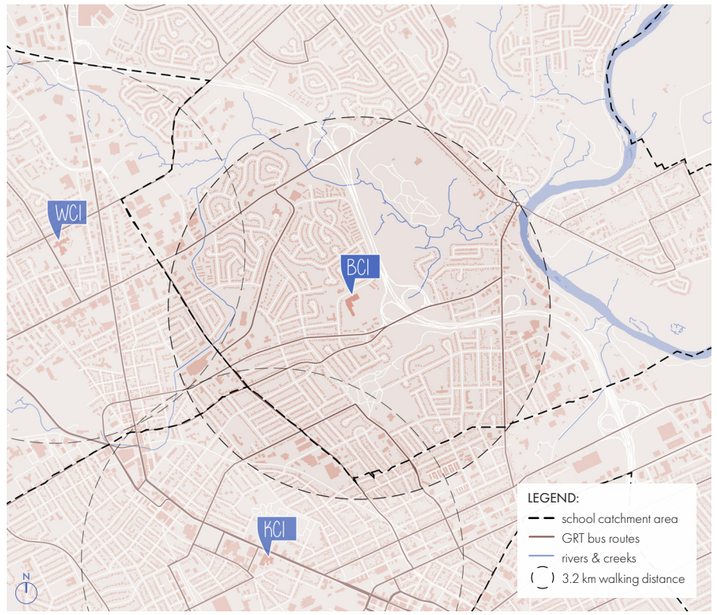


Fig. 2.26 Site map of Bluevale Collegiate Institute & student capacity vs enrollment data

NUMERICAL ASSESSMENT

- ☑ Boundaries Are Logistic
- ☑ School Is Accessible
- ☑ No Major Repairs Needed
- ☑ School Is Not Overcrowded
- ☑ School Is Not Under Utilized



Fig. 2.27 Photo demonstrating experience of arriving at Bluevale Collegiate Institute

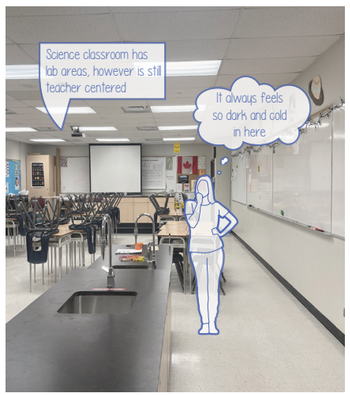
POSITIVES CHALLENGES











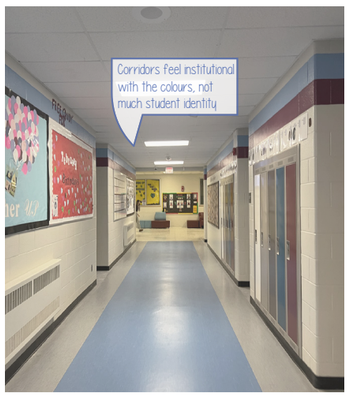


Fig. 2.28 Series of photos from site visit at Bluevale Collegiate Institute

PERSONAL NOTES:

(from site visits)

THE CHALLENGES:

- When the school was originally built, some central classrooms were designed without windows, based on the idea that windows would be a distraction. Most of these spaces have since been converted into offices.
- Classroom windows are narrow, limiting the amount of natural daylight.
- The building feels dark and isolated, surrounded by a major highway and rows of suburban housing.
- Although the building is now very accessible and has been recently renovated with modern finishes and fresh paint, it still feels formal, and the spaces lack a sense of connection.

THE POSITIVES:

- The interior feels cohesive, with new materials and feature colors thoughtfully applied throughout the building.
- An outdoor workout area is available for use by both students and the community.
- Stairways include small social hubs where students can gather and interact.
- All asbestos has been removed from the building, ensuring a safer environment.
- The building is now fully accessible, with a newly added elevator.
- Corridors are easy to navigate, featuring a circular layout that is consistent across all floors.
- Workshops and classrooms feel less clustered following recent renovations, which required careful sorting and organization.

2.5 Defining the Gaps

> *All agree we need schools but there are those who think that good, well-designed schools are an expensive luxury we cannot afford. In reality most of our contemporary schools are not good enough. The building of good schools is an important social responsibility for everyone involved; the school is often the first 'civic' building children encounter and it becomes their first formative environment.*[78]
>
> — Prue Chiles, Professor of Architectural Design Research, University of Newcastle.

Ontario's public education system is evidently facing a crisis. While quick, cost-effective solutions are currently being implemented, they come with significant drawbacks. After visiting five post-war secondary schools within the WRDSB, I observed that the OME is failing to provide spaces that support quality education. Although the OME is striving to enhance their curriculum in response to evolving pedagogies and the demands of the 21st century, a critical gap remains: the existing infrastructure is ill-equipped to meet the spatial needs of these pedagogical changes and the unique needs of each student. The industrial-style wings dominated by teacher-centred classrooms, along with windowless corridors lined with lockers, highlight the inadequacies of the OME's efforts. Reliance on portable classrooms and minor adjustments is insufficient to address these challenges. While there may be no concrete evidence that building design directly influences learning outcomes, factors such as memory, experience, comfort, and enjoyment are undoubtfully shaped by these spaces.[79] A well-designed school environment can be transformative and play a key role in supporting a student's future.

Providing higher quality school buildings is not an unreasonable demand for the province of Ontario, or for the rest of Canada. Multiple countries have proven that investing in well-designed, future-ready schools is both possible and transformative. In the UK, a nationwide program titled *Building Schools for the Future* (BSF) was launched in 2004, focusing on the rebuild or refurbishment of all secondary schools.[80] This encompassed approximately 3,500 schools with a budget of 55 billion UK pounds over 20 years.[81] Labour Schools Minister David Miliband announced the initiative in 2003, stating: "School buildings should inspire learning. They should nurture every pupil and member of staff. They should be a source of pride and a practical resource for the community."[82]

78 Leo Care et al., *Building Schools: Key Issues for Contemporary Design*, ed. Prue Chiles (Birkhäuser, 2015), 7, Preface.

79 Care et al., 9.

80 Care et al., 12.

81 Care et al., 12.

82 "Building Schools for the Future BSF," Commentary; Definition; Guidance; News; Policy (https://www.designingbuildings.co.uk), accessed April 14, 2025, https://www.designingbuildings.co.uk/wiki/Building_Schools_for_the_Future_BSF.

The UK placed significant emphasis on local participation to make this program achievable and to develop ideas for secondary education tailored to each community's needs. Every local authority was required to present an innovative vision for education, involving ideas from school governors, staff, students, and community members.[83] A diverse range of stakeholders contributed to supporting these projects both financially and with applicable ideas. While the inclusion of so many stakeholders extended timelines and increased costs, the program successfully addressed the previously neglected and underfunded state of public school buildings; like Ontario, only a handful of schools were built in the UK between the 1970s and 90s.[84] Other countries, including Portugal, Denmark, Finland, Colombia, and Australia, are also making substantial investments in improving secondary schools through ambitious programs and design guidelines.[85] These guidelines generally establish high minimum standards for education infrastructure. In Canada, it often seems that cost effectiveness and rapid construction are prioritized rather than building inspiring environments for students. There is no reason why Canada should not follow in the footsteps of countries that have demonstrated how investment in education can positively transform communities, particularly if provinces collaborate as a unified nation

With many precedents to learn from, this thesis posits that it is now Ontario's time to step up and provide the same transformative opportunities for its secondary school students. Placing the full burden on the OME and school district boards is not feasible. City councils, community members, school staff, parents, and students must also take responsibility for initiating and supporting these innovations within their communities. Although designing an entirely new program for the future of Ontario's secondary schools is beyond the scope of this thesis, this research advocates for targeted design interventions within existing schools rather than constructing entirely new facilities. By implementing these interventions in phases at one post-war secondary school in the WRDSB, the thesis lays a foundation for how other communities can support the renewal of their local schools and demonstrates how designers can reimagine these existing facilities. Optimistically, these ideas can be executed into a new program for revitalizing post-war secondary schools across Ontario.

People spend approximately 90% of their time indoors... in homes, schools, offices or other building types.[9] A well-designed and high-quality environment is therefore critical to supporting health, well-being, and overall quality of life. While transforming Ontario's public education system represents a significant investment, it promises lasting benefits for countless students and future generations.

9 "Reference Guide for Indoor Air Quality in Schools | US EPA," https://www.epa.gov/iaq-schools/reference-guide-indoor-air-quality-schools.

83 "Building Schools for the Future BSF," 13.

84 "Building Schools for the Future BSF," 13.

85 Care et al., *Building Schools: Key Issues for Contemporary Design*, 16–20.

3.0 RESPONDING TO SHIFTING EDUCATIONAL NEEDS

3.1 Understanding the Secondary Student Experience

Although adolescence is often thought of as a time of turmoil and risk for young people, it is more accurately viewed as a developmental period rich with opportunity for youth to learn and grow. Adolescence thus forms a critical bridge between childhood and adulthood and is a window of opportunity for positive, life-shaping development.[1]

When I think back to these years, I remember feeling so much older and responsible than I actually was. Now when I look at high school students, I see them as very young. It is easy to forget all the big feelings and pressures you go through at this age.

The primary focus of this section is to establish a foundation for secondary school design considerations; however, it is essential to acknowledge the principal users first: adolescents. Adolescence, marked by the onset of puberty and extending into the mid-20s, is a pivotal and rapid period of brain development and maturation.[2] To cultivate the cognitive, social, and emotional skills essential for productivity in adulthood, this stage of life requires opportunities that are full of challenges and risks.[3] As adolescents gain the cognitive maturity to question and explore their place in the world, their sense of identity begins to take shape.[4] Although internal values, beliefs, and aspirations form the core of their identity, relational and external factors, such as peers, family, teachers, learning environments and community connections, also contribute immensely.[5] The capacity to express this emerging identity and foster well-being rooted in self-confidence often relies on social experiences.[6] In the secondary school environment, crucial social experiences are consistently obstructed by challenges such as social academic pressure, learning differences, psychological distress, and peer influence. It is important to recognize that each student encounters a unique set of challenges, many of which extend beyond those discussed here.

A student's success in secondary school can determine their future; this overwhelming pressure is placed on secondary students from the very beginning. Their selected classes and extracurricular activities are seen as crucial steps toward gaining admission to the universities or colleges they aspire to attend. As a result, many students fill their schedules with AP-level courses and a variety of extracurriculars to strengthen their resumes, regardless of genuine interest. Success, however, is often measured solely by grades and test scores, leading many students to feel they must strive for quantitative perfection to be considered successful. Regularly, this is at the expense of self-discovery, meaningful relationships and mental

1 Committee on the Neurobiological and Socio-behavioral Science of Adolescent Development and Its Applications et al., *The Promise of Adolescence: Realizing Opportunity for All Youth*, ed. Richard J. Bonnie and Emily P. Backes (National Academies Press, 2019), 3, https://doi.org/10.17226/25388.

2 *The Promise of Adolescence*, 1.

3 *The Promise of Adolescence*, 2.

4 *The Promise of Adolescence*, 2.

5 *The Promise of Adolescence*, 2.

6 *The Promise of Adolescence*, 2.

health.[7] For example, if a student earns an 88% (an A) but their friend scores a 95%, they may compare themselves and feel they did not do "well enough," which diminishes their sense of achievement and tailors a competitive social environment.

There is an underlying sense of competition in high school. Even a slight difference in performance can determine who receives an award, recognition, or admission to a university or college program. In such situations, it can be difficult for students to find a sense of worth or fulfillment in what they do.

This mindset conflicts with the developmental needs of the adolescent brain, which thrives on exploration, making and learning from mistakes, and experimenting with different identities.[8] The singular grade point also neglects to recognize and reward other skills such as the ability to think, learn, work, solve problems, communicate, collaborate and contribute.[9] Given that the adolescent brain is susceptible to reinforcement and positive feedback, only validating perfect grade point averages can be especially discouraging for those who do not achieve it.[10] On the other hand, some students perceive secondary school education to be irrelevant to their lives, particularly if their aspirations do not include attending university or college. For those students, the emphasis on a standardized curriculum shaped by the narrow "college-for-all" movement can make school feel disconnected from their goals. They may not see the point in trying to do well or even attend. In the current public education system, where the value of vocational education and purpose-driven curricula aimed at developing diverse skill sets is undermined, these students are frequently left behind with a diminished sense of purpose.[11]

The challenge of learning in the standardized and grade-driven curriculum can become even more difficult for neurodiverse learners. In 2022, approximately 5.6% of Canadians aged 15 and older, representing more than 1.6 million individuals, were reported to have a learning difference.[12] Moreover, students with learning differences (LDs) are more than twice as likely to report mental health issues such as depression, anxiety disorders, and high levels of psychological distress.[13] Qualitative studies highlight themes of feeling misunderstood, needing to work harder than their peers, and the pressures of constantly developing new learning strategies to keep up.[14] While accommodations such as extended test time, notetakers, and audiobooks have been introduced to support students with LDs, these measures, limited to how information is presented, offer only a partial

7 Chelsea L. Shannon, "Never Enough: When Achievement Culture Becomes Toxic—and What We Can Do About It," *Journal of the American Academy of Child & Adolescent Psychiatry* 63, no. 2 (2024): 284–85, https://doi.org/10.1016/j.jaac.2023.10.009.

8 Committee on the Neurobiological and Socio-behavioral Science of Adolescent Development and Its Applications et al., *The Promise of Adolescence*, 167.

9 James Ballanca and Ron Brandt, *21st Century Skills: Rethinking How Students Learn* (Solution Tree Press, 2010), Foreword xx.

10 *The Promise of Adolescence*, 2.

11 *The Promise of Adolescence*, 163.

12 Statistics Canada Government of Canada, "Learning Disabilities, 2022," October 8, 2024, https://www150.statcan.gc.ca/n1/pub/11-627-m/11-627-m2024045-eng.htm.

13 Alexander M. Wilson et al., "The Mental Health of Canadians with Self-Reported Learning Disabilities," *Journal of Learning Disabilities* 42, no. 1 (2009): 24–40, https://doi.org/10.1177/0022219408326216.

14 Hazel Denhart, "Deconstructing Barriers: Perceptions of Students Labeled With Learning Disabilities in Higher Education," *Journal of Learning Disabilities* 41, no. 6 (2008): 483–97, https://doi.org/10.1177/0022219408321151.

solution. They do little to address the deeper issue: that many students with LDs, and others who struggle in teacher-centric environments, are being asked to conform to a system that does not support diverse ways of learning.

As a secondary school student, I experienced many of these challenges firsthand, so I aim to approach the design component of this thesis with empathy for those pressures and emotions. For myself, when everything became too overwhelming, I often found comfort in a quiet corner of the library or beneath a shady tree, letting myself focus individually for a moment. On days filled with confidence and a desire to socialize, I would head for the lively social staircase in the atrium or gather with my friends in my favorite teacher's classroom. While my school did not eliminate every problem or lead me seamlessly into adulthood, it provided enough varied spaces that allowed me to find support and grow through complicated experiences.

Compounding this challenge is the intense social pressure to "fit in" during the secondary school years. Receiving accommodation, such as extra help or a separate testing arrangement, can make the students feel singled out. The fear of being labelled or seen as different often leads to heightened anxiety. In some cases, students may even reject the accommodation they qualify for, despite knowing they would benefit, simply to avoid standing out with the label of a learning disability in front of their peers. Beyond this, peer pressure and social influence in general are severe during adolescence for every student, affecting relationships, clothing choices, exercise habits, emotions, and the use of drugs and alcohol.[15] Technology and social media play a role in this, providing platforms where students compare their appearance, social lives, possessions, and achievements to those of others online. This constant comparison can lead to negative self-perception.[16] However, it is important to recognize that peers, teachers, and school culture influences are not always negative; in many cases, they are positive and supportive outlets for students.

When academic stress, learning challenges, peer pressure, or low self-esteem become overwhelming, adolescents are vulnerable to depression and anxiety. In Canada, individuals aged 15 to 24 are more likely to experience mental illness and/or substance use disorders than any other age group.[17] According to the most recent *Ontario Student Drug Use and Health Survey (OSDUHS)* conducted in 2023, 51% of students reported experiencing moderate-to-serious psychological distress, including symptoms of anxiety and depression.[18] Alarmingly, 27% of students reported experiencing serious psychological distress; a figure that has risen significantly since the survey began tracking this data a decade ago.[19] These statistics indicate a growing mental health crisis amongst secondary students across Canada, one that cannot be ignored.

To ease these struggles, *Never Enough* author Jennifer Wallace offers the concept of "mattering" as a potential solution.[20] The idea of mattering includes feeling valued by and important to others; "We cannot matter

15 B. Bradford Brown, "The Extent and Effects of Peer Pressure Among High School Students: A Retrospective Analysis," *Journal of Youth and Adolescence* 11, no. 2 (1982): 122, https://doi.org/10.1007/BF01834708.

16 Corey J. Blomfield Neira and Bonnie L. Barber, "Social Networking Site Use: Linked to Adolescents' Social Self-Concept, Self-Esteem, and Depressed Mood," *Australian Journal of Psychology* 66, no. 1 (2014): 56–64, https://doi.org/10.111/ajpy.12034.

17 Caryn Pearson et al., *Mental and Substance Use Disorders in Canada*, 2013 no. 82-624-X.

18 Angela Boak and Hayley A. Hamilton, "The Mental Health and Well-Being of Ontario Students, 1991-2023: Findings from the Ontario Student Drug Use and Health Survey (OSDUHS)," *Toronto, ON: Centre for Addiction and Mental Health*, ahead of print, 2024, iv, https://doi.org/10.1037/e528202014-001.

19 Boak and Hamilton, "The Mental Health and Well-Being of Ontario Students, 1991-2013," iv.

20 Jennifer Wallace, *Never Enough: When Achievement Culture Becomes Toxic – And What We Can Do About It* (Portfolio/Penguin, 2023).

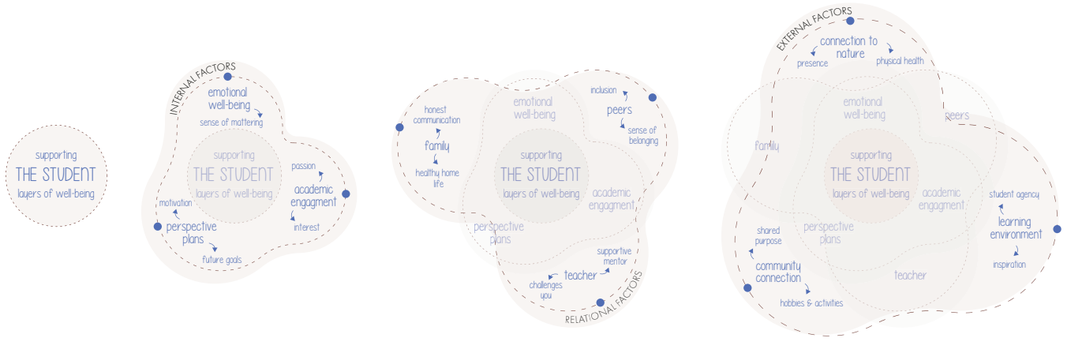


Fig. 3.1 The layers that contribute to student well-being

alone. We matter in relationship with others."[21] She argues that this sense of mattering can help foster identity, self-worth, and community, all of which are crucial components of mental health. This feeling can be cultivated both at home, in school and the community, for example, by helping a student feel like a contributing member of a household or classroom.[22] With this mindset, students can develop a sense of self-worth that extends beyond external and quantitative achievements.

With so many external influences, such as social pressures from friends, it can be difficult for students at this age to look inward and develop a sense of self. Many avoid standing out or being seen as "different," even though individuality lies at the core of who we are. Schools must find ways to cultivate this self-awareness and help students discover and embrace their unique identities.

To support challenges through the curriculum, pedagogical advancements intentionally emphasize the principles of 21st-century learning. While this term is broad, 21st-century learning's core aim is to acknowledge that every student learns differently and that education must evolve to meet the demands of an increasingly complex, interconnected, and technologically advanced world.[23] This includes nurturing critical thinking, collaboration, adaptability, and social-emotional skills. By adopting this mindset, students can develop a sense of agency, enabling them to take risks in a supportive learning environment, fostering cognitive, social, and emotional growth.

The purpose of secondary education must be reconsidered to truly support the well-being and success of adolescents. Rather than focusing narrowly on achieving high grades and an impressive résumé, schools must begin to prioritize the development of a strong sense of mattering and confidence in social settings. Equally as important is fostering the ability to think critically while applying a diverse range of skills: thinking, learning, working, problem-solving, communicating, collaborating, and contributing meaningfully to their communities.[24] While architecture alone cannot bring about a shift in public education, it can play an important role in the transformation and supporting adolescent well-being. By creating spaces that feel safe, inclusive, and responsive to diverse needs, schools can become places of growth rather than sources of distress during the formative and often challenging years of adolescence.

21 Wallace, *Never Enough: When Achievement Culture Becomes Toxic – And What We Can Do About It*, 228.

22 Shannon, "Never Enough."

23 Ballanca and Brandt, *21st Century Skills: Rethinking How Students Learn* Foreword xiii.

24 Ballanca and Brandt, *21st Century Skills: Rethinking How Students Learn* Foreword xxi.

3.2 Outlining Three Scales of Pedagogy

> *In itself architecture cannot change anything; what it does do is to prepare the way for change.*[25]
>
> — Giancarlo De Carlo, Italian architect and anarchist.

The values, beliefs and pedagogical practices of a school serve as the foundation for a great learning environment and shape the use of learning spaces.[26] As priorities shift to emphasize student well-being, critical thinking, and broader measures of success, architectural design has the potential to respond in meaningful and impactful ways. While revising Ontario's educational values and pedagogies is beyond the scope of this thesis, the design component will focus on architectural strategies that embody and advocate for contemporary pedagogical approaches. The refocused outcome adopted of the secondary school is to help students graduate with a strong sense of mattering, emerging as confident, capable individuals with diverse and adaptable skills. To realize these aspirations, the design strategy draws on three complementary pedagogical theories, each influencing a distinct scale of intervention within and around the school building.

STAGES OF CHANGE FOR IMPACTFUL EDUCATIONAL TRANSFORMATION:

1. KNOWLEDGE & SKILLS
driven by: students, school boards & ministry of education
The first step involves assessing the desired outcomes for students as they transition from secondary school

2. PEDAGOGY & CURRICULA
driven by: teachers & school boards
Next, the teaching context and instructional approaches should be adapted to support desired outcomes

3. ASSESSMENTS
driven by: students, teachers & ministry of education
Assessment and grading should then reflect and reinforce the skills & context students are actively learning and practicing

4. TECHNOLOGY
driven by: students, teachers & school boards
Students must also have access to the appropriate equipment needed to develop specific skills

5. LEARNING ENVIRONMENT
driven by: students, teachers, community & architects
Lastly, the learning environment should be designed to facilitate the desired skills, instructional approaches, assessment methods, and the integration of relevant technology

25 Ole Bouman and Roemer van Toorn, "Architecture Is Too Important to Leave to the Architects. A Conversation with Giancarlo De Carlo," *Archis*, 2005, https://archis.org/volume/architecture-is-too-important-to-leave-to-the-architects-a-conversation-with-giancarlo-de-carlo/.

26 Murray Hudson and Terry White, *Planning Learning Spaces: A Practical Guide for Architects, Designers and School Leaders* (Laurence King Publishing, 2019), 25.

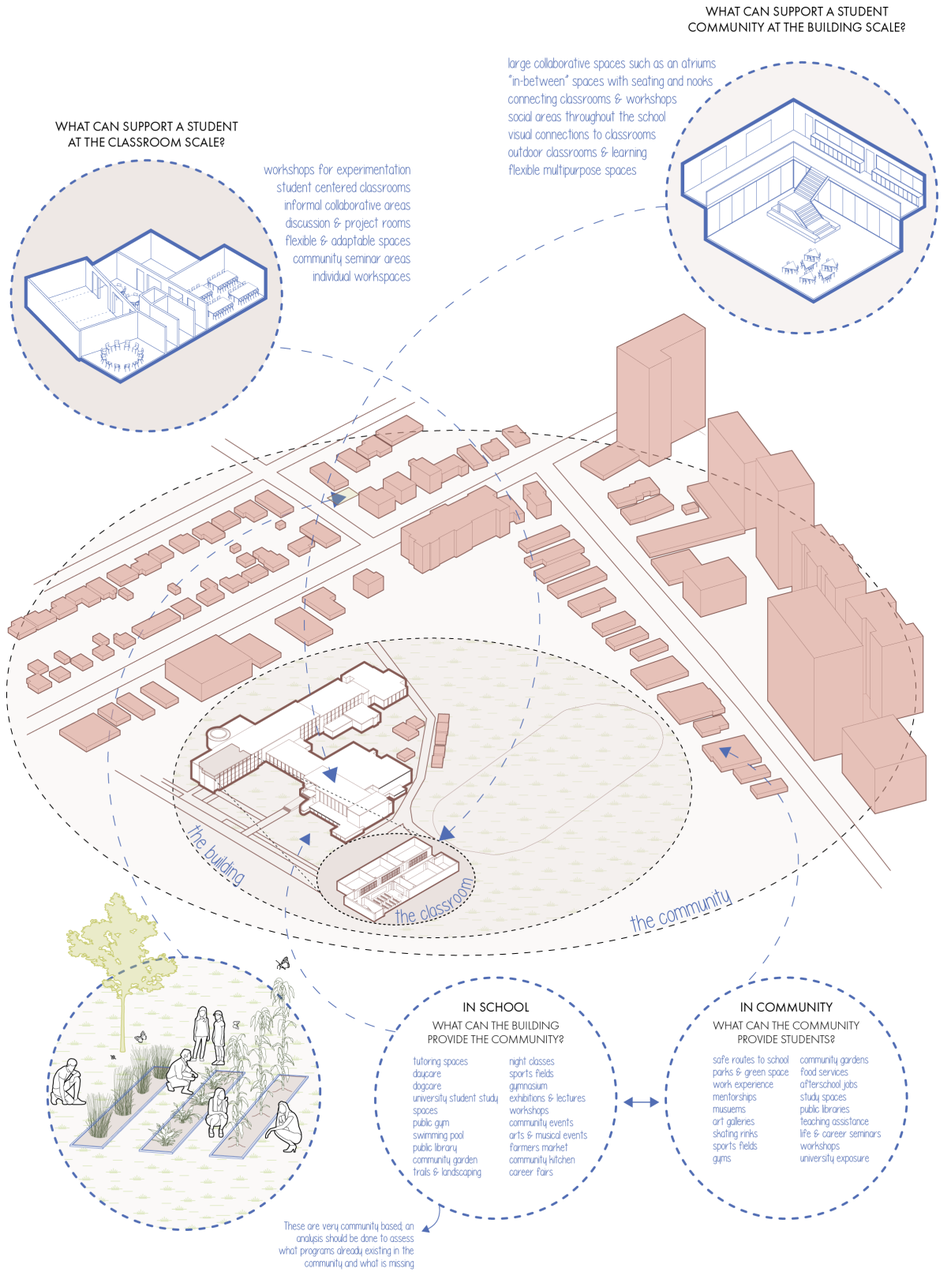
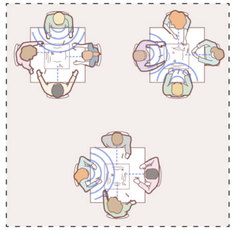


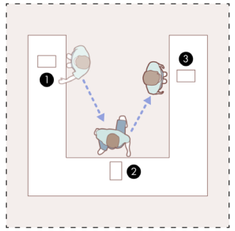
Fig. 3.2 Diagram relating three scales of pedagogy to architectural space

1 VERBAL



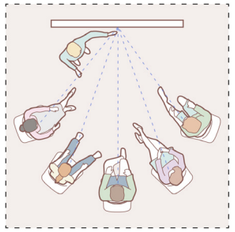
speaking, listening, writing

2 LOGICAL



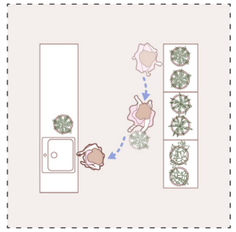
steps, order, goal orientated

3 VISUAL



drawings, pictures, reading

4 KINESTHETIC



hands on work, dancing, movement

1. The Theory of Multiple Intelligences: The Classroom Scale

In a typical classroom, there are twenty-five identical desks arranged for twenty-five different students. Each student will have their textbook opened to the same page, copying notes from the board as the teacher lectures for most of the class. This teacher-centred model has unfortunately become the default design that shapes most classrooms. Not only are these classrooms uninspiring, but they are also extremely limiting to a student's learning. Research has shown that the lecture-style approach is one of the least effective learning methods, with a student's ability to pay attention and retain information generally matching the number of minutes equal to their age.[27] At the same time, the standard classroom fails to acknowledge the reality of students; internally, each of these 25 students has unique needs and preferences.[28] How each student learns best and responds to information is never identical. They are at different stages in their learning journey and have individual interests that will lead to diverse paths beyond the classroom.[29]

Offering a valuable lens into the diverse ways students think and learn, Howard Gardner's *Frames of Mind: The Theory of Multiple Intelligences* identifies eight distinct types of intelligences: verbal, logical, visual, bodily, musical, interpersonal, intrapersonal, and naturalist.[30] Each intelligence represents a unique way individuals solve problems or create meaning.[31] Crucially, Gardner's framework suggests that individuals do not possess just one or two of these intelligences, but rather several with different strengths and amalgam.[32] For example, a student might simultaneously be strong in verbal, musical, and naturalistic intelligences. Recognizing that students carry an array of abilities and intelligences proves that a one-size-fits-all teaching approach is impractical.

Despite this understanding, the curriculum and standardized assessments tend to emphasize only a few of the intelligences Gardner identified. Research notes that most standardized tests focus solely on linguistic and logical-mathematical abilities, while neglecting others.[33] As a result, students with strengths in different areas may struggle to demonstrate their capabilities, resulting in lower grades. The standardized tests often overlook important skills such as creativity, critical thinking, self-discovery, or ethical reasoning. Given the current classroom's inability to recognize the diversity of student skills, both the role of the teacher and the structure of the learning environment must shift to become more student-centered, supporting learners in developing and applying their

27 Hudson and White, *Planning Learning Spaces*, 23.

28 Hudson and White, 23.

29 Hudson and White, 23.

30 Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (Basic Books, 2011).

31 Kathy Checkley, "The First Seven. . . and the Eighth: A Conversation with Howard Gardner," *Association for Supervision and Curriculum Development (ASCD)*, Teaching for Multiple Intelligences, vol. 55, no. 1 (1997): 8–13.

32 Checkley, "The First Seven. . . and the Eighth: A Conversation with Howard Gardner."

33 Hani Morgan, "Howard Gardner's Multiple Intelligences Theory and His Ideas on Promoting Creativity," in *Elebrating Giants and Trailblazers: Celebrating Giants and Trailblazers: A-Z of Who's Who in Creativity: A-Z of Who's Who in Creativity Research and Related Fields Research and Related Fields*, ed. Fredricka Reisman (KIE Publications, 2021), 130.

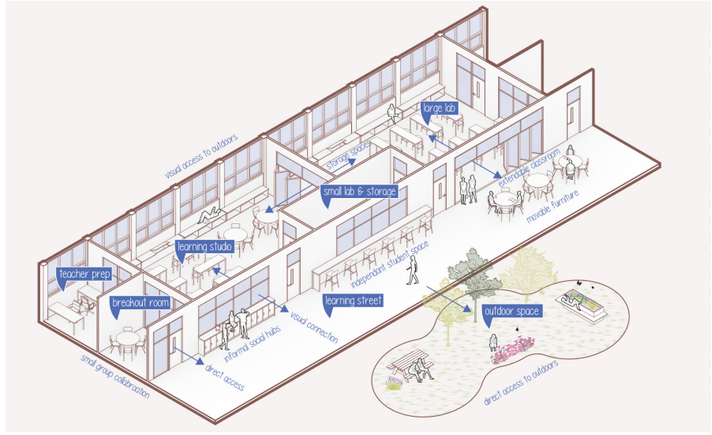


Fig. 3.4 Example of the learning suite

unique combinations of intelligences. This might involve encouraging students to explore curriculum context through conversations, writing, experiments, projects, or even dancing. While teachers do not need to deliver lessons in all eight intelligences, they can empower students by first recognizing students' strengths and then giving them choice over how they learn while offering guidance and suggestions tailored to individual needs. In this role, teachers act not necessarily as experts in every approach, but as partners and facilitators in the learning process.

When this theory of multiple intelligences is introduced in the context of the curriculum, the design of the classroom or learning space can become a significant tool to support it. In 1968, the Educational Facilities Laboratories (EFL) introduced the concept of the "learning hub," challenging the conventional four-walled classroom.[34] Rather than a single uniform space, the hub is a cluster of rooms and open areas, each tailored to a distinct mode of learning: presentation and instruction, group collaboration, quiet study, hands-on creation, social interaction, or outdoor connection.[35] Although architects have since refined and expanded these types of areas, the core intent has remained: to grant students agency and responsibility for how and where they learn.[36] Every zone in the hub's size, location, adaptability, and equipment is purposely selected with the learning mode in mind.[37] Research consistently shows that students and their teachers respond positively to these hubs, experiencing a more flexible, engaging, and collaborative environment.[38]

34 Neil Gislason, "Building Paradigms: Major Transformations in School Architecture (1798-2009)," *Alberta Journal of Educational Research* 55, no. 2 (2010): 245, https://doi.org/10.55016/ojs/ajer.v55i2.55322.

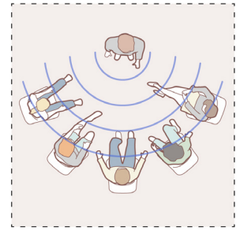
35 Hudson and White, *Planning Learning Spaces: A Practical Guide for Architects, Designers and School Leaders*, 24.

36 Ronald Gross and Judith Murphy, *Educational Change and Architectural Consequences: A Report on Facilities for Individualized Instruction* (Educational Facilities Labs., Inc., 1968), 26.Inc., 1968

37 Hudson and White, *Planning Learning Spaces: A Practical Guide for Architects, Designers and School Leaders*, 56.

38 Omolola Adedokun et al., *Student Perceptions of a 21st Century Learning Space*, Journal of Learning Spaces, vol. 6, no. 1 (2017): 37.

5 MUSICAL



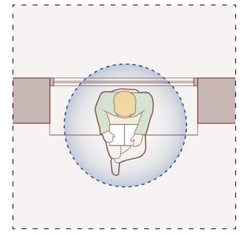
sound, rhythm, music

6 INTERPERSONAL



collaboration, discussions, relating

7 INTRAPERSONAL



independent, self-reflection, quite

8 NATURALIST



patterns in nature, understanding

Fig. 3.3 Diagram illustrating the eight types of intelligences

2. The Theory of 21st Century Learning: The Building Scale

I remember the chaotic five-minute period between classes, a blur of noise, motion, and pressure. I would feel anxious and claustrophobic as I tried to push my way through the stream of students. It was a moment when the entire school seemed to move at once, yet there was no time to breathe or connect with anyone. Especially when my next class was far away, all I could think about was getting out as quickly as possible.

In addition to a classroom of 25 students, a school building contains approximately 49 more identical classrooms. The buildings are confined to the "cells and bells" model, where students occupy cells, known as classrooms, until the bell signals it is time to move to the next cell. The time between the cells is often limited to five minutes, rushing students through dim and disorienting corridors. Throughout the 8 am to 3 pm day, students switch cells three to five times, repeating the same routine from Monday to Friday.

The tedious schedule and repetitive architecture of school buildings can diminish students' creativity and limit the scope of curriculum content. Students are most commonly expected to develop memorization and routine problem-solving skills using filtered information, without questioning concepts or applying them to real-world situations.[39] Within this 20th-century framework, little time is devoted to developing or assessing the crucial skills needed for the rapidly changing world.[40] Although education has historically been a system that evolves slowly by building upon tried and true methods, the 21st century has brought immense changes in how information is accessed and understood.[41] The force of globalization has reshaped the world through growing reliance on technology, virtual connectivity, extensive access to information, cultural and economic convergence, and the incessant circulation of ideas, goods, and people.[42] As a result, there is a pressing need to adapt education to the 21st century.

The anthology *21st Century Skills: Rethinking How Students Learn* informs that: "a 21st-century education must be tied to *outcomes*, in terms of proficiency in core subject knowledge and 21st-century skills that are expected and highly valued in school, work and community settings."[43] Instead of concentrating on the information itself, the theory of 21st-century learning suggests reevaluating *how* learning happens. This framework emphasizes the development and assessment of essential skills, including thinking, working, learning, problem-solving, creativity, self-direction, communication, collaboration, contribution, adaptability, responsibility, and global awareness.[44] Embracing this vision, Singapore approaches 21st-century learning through its *Teach Less, Learn More* educational framework, which promotes student interest in lifelong, fulfilling, and life-sustaining learning.[45] *Teach Less* does not refer to reducing instructional time or minimizing the curriculum, but instead thinking critically about what to teach and how to teach it.[46] In a world of endlessly expanding digital information, it is essential to be selective by balancing quantity with quality. Similarly, *Learn More* does not mean adding to an already dense curriculum, but focuses on meaningful outcomes in 21st-century skills through active, engaged learning.[47] While implementing this program in Singapore has not been a straightforward process, teachers have found that the student-centred curriculum benefits students immensely. Students have become more willing to learn and assertive in taking ownership of their learning experiences.[48]

Following a similar approach, problem- and project-based curricula have been introduced internationally to support the movement of 21st-century learning. Faced with complex global challenges, like the climate crisis, technological disruption, and economic inequality, the next generation requires strong problem-solving skills.[49] This curriculum goes beyond asking students to answer the short-term "problems" at the end of textbook chapters or to individually complete math questions by looking up answers in the back of the book. It calls for students to engage with realistic, authentic problems that require deeper thinking and meaningful solutions; solutions that teachers may not be able to mark as correct or incorrect.[50] In a project-based curriculum, students assess problems or complete projects; here, they have opportunities to ask thoughtful questions, carry out purposeful investigations, think critically, draw conclusions, and reflect until they reach meaningful solutions.[51] These projects and problems equip students with the ability to think creatively, learn authentically, and engage in meaningful collaboration to solve real-world challenges.

Once these values are embedded in the curriculum, the school building can become a place of action, where students practise 21st-century skills in an environment that is both safe and challenging. Although the Ontario Ministry of Education has begun incorporating ideas of 21st-century learning through guides such as *Learning for All, Kindergarten to Grade 12*, this progressive educational model cannot thrive within the outdated "cells and bells" buildings that still dominate.[52] Replicating the 25-student, 50-classroom school will not support the development of the skills needed by the next generation and will increasingly be seen internationally as an outdated learning environment.[53] The 21st century calls for schools that dedicate every square inch to learning and socialization.

As a starting point for implementing these ideas in a supportive and physical learning environment, Neil Gislason, architectural researcher and scholar of school design, suggests that "learning takes concrete shape, in other words, within its social-material surround. A school site

39 Chris Dede, *21st Century Skills: Rethinking How Students Learn* (Solution Tree Press, 2010), 54.
40 Chris Dede, *21st Century Skills: Rethinking How Students Learn*, 54.
41 Howard Gardner, *21st Century Skills: Rethinking How Students Learn*, 9.
42 Gardner, *21st Century Skills: Rethinking How Students Learn*, 10.
43 Ken Kay (Foreword), *21st Century Skills: Rethinking How Students Learn*, xxi.
44 Kay (Foreword), *21st Century Skills: Rethinking How Students Learn*, xx.
45 Robin Fogarty and Brain Pete, *21st Century Skills: Rethinking How Students Learn*, 100.
46 Fogarty, *21st Century Skills: Rethinking How Students Learn*, 103.
47 Fogarty, 104.
48 Fogarty, *21st Century Skills: Rethinking How Students Learn*, 112.
49 John Barell, *21st Century Skills: Rethinking How Students Learn*, 177.
50 Barell, *21st Century Skills: Rethinking How Students Learn*, 178.
51 Barell, *21st Century Skills: Rethinking How Students Learn*, 178.
52 Ontario Public Service, *Learning for All – A Guide to Effective Assessment and Instruction for All Students, Kindergarten to Grade 12* (Queen's Printer for Ontario, 2013).
53 Bob Pearlman, *21st Century Skills: Rethinking How Students Learn*, 144.

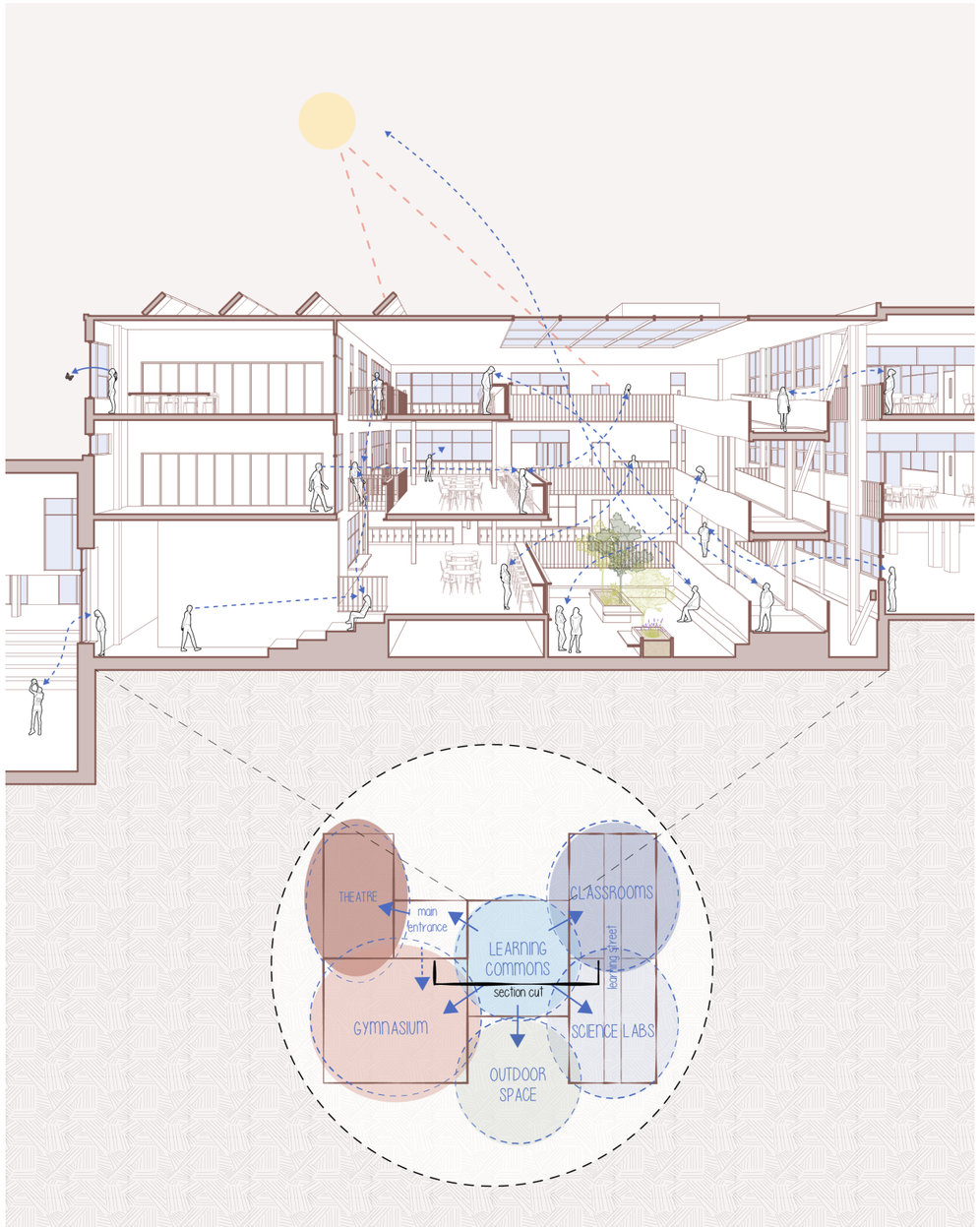


Fig. 3.5 Section demonstrating the physical and social connections formed through thresholds and parallel spaces

should therefore support dynamic learning processes, both materially and socially, but this does not necessarily happen in every setting."[54] In this sense, the school building should provide an array of spaces, each contributing distinct physical or social impacts. Often unconsciously, these spaces will communicate ideas, form perceptions, and guide actions, as a third teacher for the student.[55] Herman Hertzberger advocates that the "in-between" and "threshold" spaces are among the most powerful learning environments for students; they are places of meeting.[56] In his book *Lessons for Students in Architecture*, Herzberger notes:

> *The threshold provides the key to transition and connection between areas with divergent territorial claims and, as a place in its own right, it constitutes, essentially, the spatial conditions for the meeting and dialogue between areas of different orders.*[57]

Simple architectural elements, such as doors, windows, stairs, and elevators, serve to connect and separate, establishing important physical and social relationships within a building.[58] These thresholds are dynamic spatial opportunities.[59] They shape the potential for key social moments that foster a sense of belonging, spark curiosity for authentic learning, and create a sense of mattering. Transitional spaces of varying scale and character also help support and guide students' emotional experiences throughout the day; a quiet corridor may serve as a place of escape for a student. As such, the entire school building must be conceived as a learning environment. Elements such as atriums, corridors, windows, and stairways contribute to essential social and individual experiences that are crucial for developing the 21st-century skills discussed.

Learning is not confined to the classroom; it happens everywhere. By reimagining the entire school site as a learning landscape rather than relying solely on 50 enclosed classrooms, the issue of overcrowding can begin to be addressed through spatial flexibility and distributed learning opportunities.

54 Neil Gislason, "Placing Education: The School as Architectural Space," *Paideusis* 16, no. 3 (2020): 6, https://doi.org/10.7202/1072485ar.

55 Gislason, "Placing Education," 6.

56 "City Schools as Meeting Places – Architecture and Education," 2025, https://architectureandeducation.org/2019/06/10/city-schools-as-meeting-places/.

57 Herman Hertzberger, *Lessons for Students in Architecture* (010 Publishers, 2005), 32.

58 "City Schools as Meeting Places – Architecture and Education."

59 "City Schools as Meeting Places – Architecture and Education."

In Ontario, students must complete 40 hours of community involvement activities (volunteering or work experience) to graduate.[10] While this is a good starting point, it only adds up to five full days over four years. Students need far more time engaging with their communities to build real-world skills and confidence for adulthood. This time with the community could also be integrated into the school learning experience through reflection, mentoring, project-based learning, and opportunities to apply classroom knowledge in real-world contexts.

[10] "Earning Your High School Diploma | Ontario.Ca," June 12, 2020, http://www.ontario.ca/page/earning-your-high-school-diploma.

3. The Theory of Community-Based Learning: The Community Scale

Beyond the school building itself, the broader region contains many institutions; there are 16 secondary schools in the Waterloo Region School District School Board (WRDSB) alone.[60] Each of these schools are located within a unique community, influenced by varying scales, demographics, urban density levels, and access to nature. Despite these differences, the schools serve a similar purpose: they gather as many students as possible onto a large property from 8 am to 3 pm. This often results in students being isolated from the "real world," which can make transitioning into adulthood more difficult. Breaking down the barriers between classrooms alone is not enough for adolescent developmental needs; there is also an urgent need to reduce barriers between the school grounds and the communities beyond them.[61]

This need for connection aligns with the ideas presented by Gregory Smith and David Sobel in *Place- and Community-based Education in Schools*, where they describe community-based education as an approach that seeks to balance human and non-human interactions, fostering a society that is both socially just and ecologically sustainable.[62] By framing education within the context of community and environment, schools can move beyond isolation and become a home base surrounded by sites where students actively engage with the world around them. The Rural School and Community Trust, a nonprofit organization that addresses the crucial relationship between successful schools and thriving communities, further define this concept:

> *Place-based education is learning that is rooted in what is local—the unique history, environment, culture, economy, literature, and art of a particular place. The community provides the context for learning, student work focuses on community needs and interests, and community members serve as resources and partners in every aspect of teaching and learning. This local focus has the power to engage students academically, pairing real-world relevance with intellectual rigor, while promoting genuine citizenship and preparing people to respect and live well in any community they choose.*[63]

Place-based education positions students at the center, emphasizing the exploration of their talents, interests, and potential career paths while drawing on the knowledge and resources of the surrounding community.[64] In this model, responsibility is shared with community members, who help educate students while introducing them to the responsibilities and possibilities of adulthood.[65] Offices, workshops, parks, and other

60 Watson & Associates Economists Ltd., *Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review* (Mississauga, ON, 2015).

61 Gregory A. Smith and David Sobel, *Place- and Community-Based Education in Schools* (Routledge, 2010), 21.

62 Smith and Sobel, *Place- and Community-Based Education in Schools*, 22.

63 "Ruraledu.Org," https://www.ruraledu.org/.

64 Smith and Sobel, *Place- and Community-Based Education in Schools*, 22.

65 Smith and Sobel, *Place- and Community-Based Education in Schools*, 23.



Fig. 3.6 Map of local programs around Bluevale Collegiate Institute offering opportunities for student involvement

community spaces become extensions of the classroom, offering real-world contexts in which students can practice skills, engage in problem-solving, and develop social awareness.[66]

Although the primary focus is on students' individual learning journeys, this approach naturally fosters meaningful contributions to the community, whether through awareness projects, environmental initiatives, or volunteering. By leveraging the unique assets of each community, students gain practical experience, civic awareness, and a sense of belonging, while communities benefit from their energy, creativity, and engagement. This reciprocal relationship transforms the broader environment into a living classroom, preparing students for adulthood in a socially connected and ecologically attuned way.

Extending learning beyond the school property can also help address the issue of overcrowding. For example, if even 20% of students spend their day learning in the community between 8 am and 3 pm, additional space is freed within the building for those who remain. This idea is not entirely new: the City-As-School model, established in New York in 1972, reimagined the city itself as a classroom.[67] Its objective was to provide students with a multitude of learning opportunities rooted in the urban environment.[68] The program relies on freedom, trust, and responsibility from both students and community members, fostering an environment where learning can occur through hands-on experiences, such as internships, portfolio preparation, or engagement with work across the

66 Smith and Sobel, *Place- and Community-Based Education in Schools*, 23.

67 *City-As-School High School | About*, https://www.cityas.org/about/.

68 *City-As-School High School | About*.

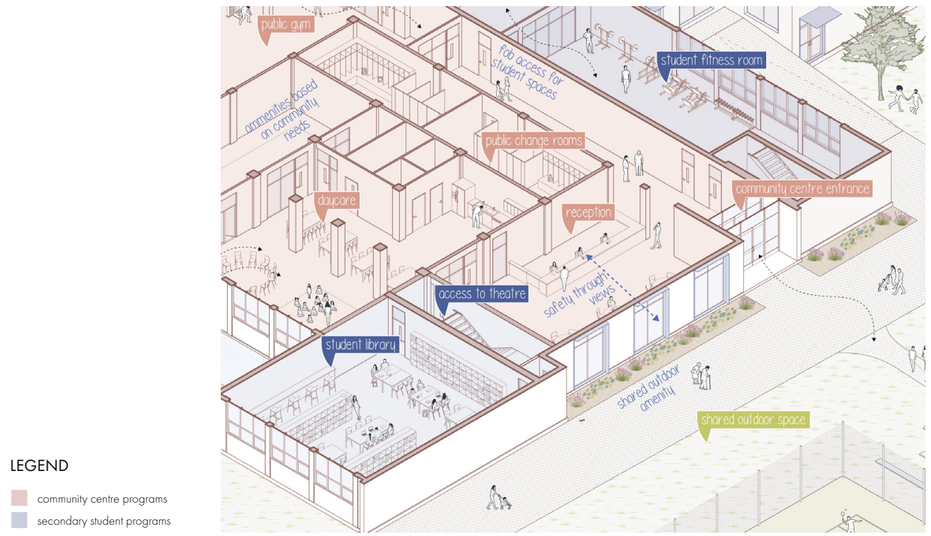


Fig. 3.7 Diagrams illustrating a balance between student programs and community programs

city. By drawing on the surrounding community as part of the learning landscape, schools not only relieve pressure on physical space but also enrich students' educational experiences.

The physical school buildings and their sites hold far more potential than is often recognized. Beyond serving as spaces for instruction, schools can also function as vital community resources. Currently, most schools in the WRDSB are used almost exclusively by students and teachers during school hours, with limited activity for preparation or extracurricular sports. While gymnasiums and fields are often rented out for student athletics, most of the building and grounds remain vacant for nearly two-thirds of the day. By introducing programs that respond directly to community needs, schools could instead become twenty-four-hour spaces that support and unite their students and community.[69] Fostering social and educational connections, community integration can also generate significant economic benefits. Introducing programs such as daycares, public libraries, gyms, community gardens, makerspaces, mentorship opportunities with elders, and adult education workshops not only maximizes the use of existing infrastructure but also opens new funding opportunities. For instance, by partnering with licensed childcare providers, schools can access government grants to help renovate or construct spaces for daycares, reducing financial strain on the school board while providing much-needed services to families.[70] This strategy relies on school and community members to participate in a collective action: through volunteer work to keep programs running, ensure community safety, and provide leadership.

The idea of a "community school" is not new either; this concept was first discussed by Henry Morris, Chief Education Officer for Cambridgeshire, in 1925, who wrote: "As the centre of the community it would provide the whole of man, and abolish the duality of education and ordinary life [...] There would be no 'leaving school'! —the child would enter at three and leave the college only in extreme old age."[71] As Morris suggests, education should be a lifelong activity. To support this, schools must be architecturally open and welcoming for all generations, serving as spaces for meeting, gathering, and community engagement.[72] This openness should be expressed in both interior and exterior spaces, with flexible and accessible spaces.[73]

Introducing the public to the school raises important questions about security and safety. While students' safety can be supported through the vigilance of teachers, peers, parents, and community members, architects and designers can also enhance safety through thoughtful and deliberate design strategies.[74] Features such as windows can create openness and visual connection between spaces, while also serving as subtle dividers. Similarly, lockable doors regulate access, controlling who can move through specific areas and when. Looking at a large scale, public programs can be massed together, divided by floors or blocks of spaces.[75] Overall, with thoughtful design strategies and strong community partnerships, the concept of a 'community school' can be highly successful.

The community school concept can also address the issue of overcrowding. As seen from population density changes and shifting settlement patterns, student enrolment is inherently unpredictable; a reality that applies broadly. It could be argued that the peak of the baby boom has passed, and student numbers will decline, yet historical patterns in the Waterloo Region show that population growth predictions are often inaccurate. Even if a school is projected to have higher enrolment in 25 years, this is never guaranteed. Student populations can fluctuate over time, sometimes dramatically; schools must function as flexible, adaptable spaces. If enrolment decreases, the community can make use of the additional space. If enrolment increases, community programs can be scaled back to accommodate more students. Flexibility is key. Schools should serve as spaces for everyone, not just the unpredictable secondary student population.

69 Leo Care et al., *Building Schools: Key Issues for Contemporary Design*, ed. Prue Chiles (Birkhäuser, 2015), 91.

70 "More Child Care Fee Reductions Coming for Ontario Families," News.Ontario.Ca, 2025, https://news.ontario.ca/en/release/1004938/more-child-care-fee-reductions-coming-for-ontario-families.

71 Henry Morris, *The Village College. Being a Memorandum on the Provision of Educational and Social Facilities for the Countryside, with Special Reference to Cambridgeshire* (1925), quoted in: 'Henry Morris, Village Colleges and Community Schools'. http://infed.org/mobi/henry-morris-village-colleges-and-community-schools/.

72 Adam Wood, "City Schools as Meeting Places," *Architecture and Education*, June 10, 2019, https://architectureandeducation.org/2019/06/10/city-schools-as-meeting-places/.

73 Wood, "City Schools as Meeting Places."

74 Care et al., *Building Schools: Key Issues for Contemporary Design*, 107.

75 Care et al., 94.

3.3 Case Studies of Contemporary Schools

> *The design of schools is one of the most important areas of architecture, because it can have one of the greatest impacts on shaping lives. Yet, as an area of architectural practice, it has never received the attention it deserves.*[76]
>
> — Herman Hertzberger, Dutch architect and professor.

The case studies presented in this section exemplify designs that stem from a deep understanding of students' environmental needs, contemporary teaching methods, diverse learning practices, and meaningful connections to the community. Each one goes beyond the standardized school, pursuing designs that help students develop the skills they need to be successful, while also enabling teachers to facilitate positive and diverse learning environments. The spaces are deliberately crafted with theories such as multiple intelligences, 21st-century learning, and community-based education in mind.

While the conditions of these schools vary, offering unique contrasts to the research design project, each addresses a different component worth referencing. The first condition to consider is climate applicability. Many of these precedents prioritize large windows to enhance daylighting, well-being, and the overall quality of learning; however, if not carefully designed, a high window-to-wall ratio can significantly reduce the building's overall enclosure performance. In Ontario's cold climate zone, window placement and orientation must therefore be strategic to achieve an efficient balance between daylight access and thermal performance. As such, while not all these schools are fully climate-appropriate, they remain valuable precedents for other aspects of design. Additional key considerations include the reuse of existing infrastructure, the affordability of the design within Ontario's public school system, the capacity to accommodate both current and projected student populations, and the integration of community programming.

No single school meets all the criteria considerations, but together, the selected case studies form a unit that collectively addresses all the key principles. Each project is highly successful, responding uniquely to the specific conditions of its project. Referring to these contemporary secondary schools will provide meaningful inspiration for the renewal of an existing secondary school in Section 4.0.

76 Hertzberger (Foreword), *Planning Learning Spaces: A Pratical Guide for Architects, Designers and School Leaders*, 9.



Fig. 3.8 Case studies consideration criteria

KMBR Architects

ARGYLE SECONDARY SCHOOL

North Vancouver, BC

Capacity: 1,300 students
Size: 12,815 sq.m.
Built: January 2021
Cost: ~ $61.7 million
Built Type: new build



Like the sliding glass doors on the first floor, the bridge provides direct, north facing access to the outdoors from the second level

Together, these features establish an accessible, versatile outdoor learning environment that is visually linked to the interior, while also allowing natural ventilation throughout the building.

Fig. 3.9 Exterior amphitheater seating at Argyle Secondary School



Large areas of glazing are strategically placed to allow visual and physical connections with the surrounding site.

Fig. 3.10 Exterior view of library and outdoor learning spaces at Argyle Secondary School

Argyle Secondary School is a two-storey building designed to embody 21st-century learning.[77] From the structure, which utilizes nail-laminated timber ceilings and glue-laminated columns, to the adoption of learning communities over traditional classrooms, this building embodies innovation and creativity for the next generation.[78] At the site scale, the design connects to surrounding nature through extensive glazing and outdoor classrooms that engage directly with Mount Fromme and Kilmer Creek.[79] Inside, a welcoming atrium, operable glazed walls, and large overhead doors create an inclusive, transparent, and adaptable environment for students, staff, and the broader community.[80] Climate-responsiveness is also central, with an air-to-water heat exchanger powered by electricity and supported by passive systems that reduce environmental impact while ensuring occupant comfort.[81] Distributed throughout the building, small "learning communities" include studios, labs, breakout rooms, and teacher-prep areas, supporting diverse teaching and learning approaches.[82] As a public school in British Columbia, Argyle demonstrates what is possible in Canada: addressing affordability and high enrollment while providing a forward-looking, sustainable, and inclusive environment.

77 "Argyle Secondary School," *KMBR Architects*, https://www.kmbr.com/portfolio/argyle-secondary-school/.
78 "Argyle Secondary School."
79 "Argyle Secondary School."
80 "North Van's New École Argyle Secondary Reflects Modern Approach to Learning," https://www.sd44.
81 "North Van's New École Argyle Secondary Reflects Modern Approach to Learning."
82 "Argyle Secondary School."



Extensive glazing, such as this, are strategically placed only in key moments to minimize heat loss during the winter months. Although the space faces south, large trees provides natural shading in the summer, preventing overheating.

The architecture negotiates between openness and enclosure to manage acoustics and privacy, while the garage doors introduce a layer of choice for occupants.

The open atrium establishes a highly flexible environment, readily adaptable to the needs of students, teachers, and the community at different times of day.

Fig. 3.11 Interior atrium space with bridge at Argyle Secondary School

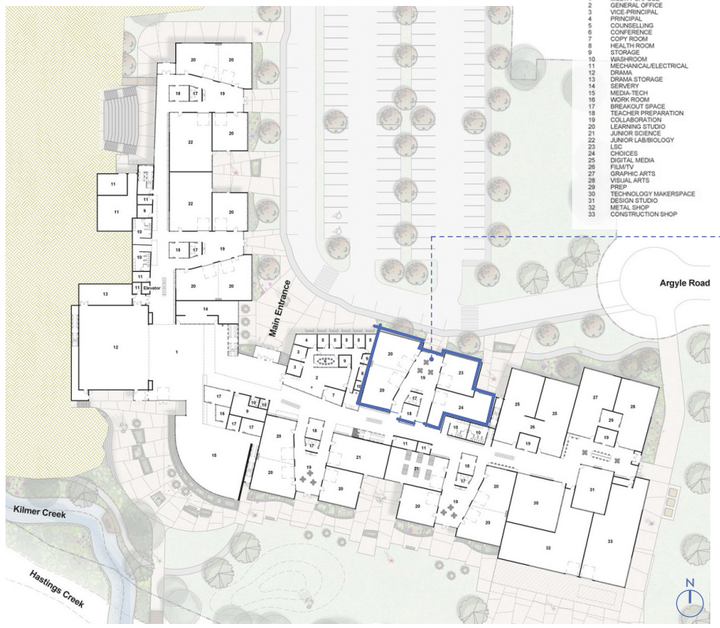


Fig. 3.12 Ground floor plan of Argyle Secondary School



The building uses mass timber for reduced embodied carbon, while incorporating steel where need for efficiency. This photo shows a learning community under construction. The notches in the structure reflect the program's layout and contribute to a bright, well-lit interior.

Fig. 3.13 The learning community under construction at Argyle Secondary School

GOA Architecture

COMMON GROUND HIGH SCHOOL

New Haven, Connecticut, USA

Capacity: 180 students
Size: 1,371 sq.m.
Built: June 2016
Cost: ~ $7.5 million
Built Type: new build



The bridge not only ensures accessibility but also enhances the arrival experience, creating a sense of anticipation and excitement. Beneath it, a shaded ground-level entry forms a porch-like condition that encourages social connection and gathering.

CLT serves as the primary structure, its presence made evident in every detail, from the interior spaces to the exterior form.

Fig. 3.14 Main entrance of Common Grounds High School



Corridors are designed as layered spaces for learning, resting, socializing, and observing. As such, these transitional areas are as important to the school and its programs as the primary classrooms.

Fig. 3.15 Corridor space at Common Grounds High School

Common Ground functions as a high school, urban farm, and environmental education centre, supporting programs for both adolescents and the surrounding community.[83] Situated on a large, green site, the school integrates urban agriculture and sustainable land management into an innovative curriculum.[84] During the day, the building facilitates an alternative model of high school education, while in the evenings it hosts programs for young children and adults.[85] This creates an amazing connection to the community through programming, addressing the community scale. The building nestles naturally into its context, embedded among farm structures, agricultural fields, upland forests, and wetland habitats.[86] From the welcoming bridge that leads to the entrance to the operable garage doors of the gymnasium, the design fosters fluid connections between interior and exterior spaces. Its small scale and intimate interiors encourage meaningful relationships, while its functionality exemplifies sustainable innovation through on-site energy production, stormwater treatment, natural daylighting, and passive ventilation.[87] The use of CLT as the primary structure also enhances this environmental ethos, imparting a sense of warmth and connection to nature.

83 "Common Ground High School | Projects," GOA, https://www.goa.world/projects/common-ground-high-school.
84 GOA, "Common Ground High School | Projects."
85 "Common Ground High School | Projects," GOA.
86 "Common Ground High School | Projects," GOA.
87 "Common Ground High School | Projects," GOA.



The gymnasium is designed as a multi-purpose community space, capable of accommodating a wide range of activities and events.

The beams carefully frame rooflights, filling the interior with natural daylight. The garage doors open the space outward, allowing activities and the community to flow seamlessly between inside and outside.

Seating stairs bring the audience directly into the action, creating a more communal space than conventional bleachers.

Fig. 3.16 Gymnasium with seating at Common Grounds High School

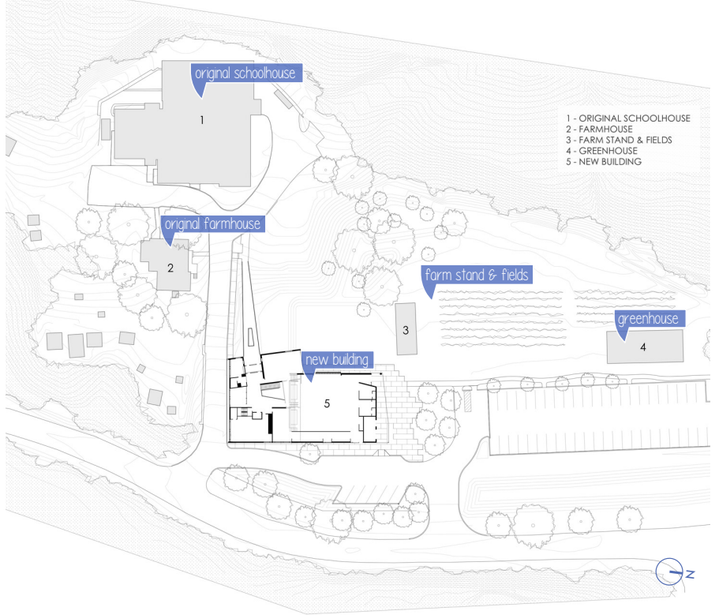


Fig. 3.17 Site plan of Common Grounds High School



The site allows students to engage in hands-on learning, while classrooms provide opportunities to use technology for deeper exploration and reflection. At every scale, the design is guided by the goal of fostering learning while strengthening connections to nature.

Fig. 3.18 Classroom at Common Grounds High School



With the careful and intentional use of CLT as the primary building material, the school was constructed using only five workers and a single crane lift, significantly reducing carbon emissions associated with the construction process.

Fig. 3.19 Construction of Common Grounds High School

FBM Architecture

MARINE DRIVE ACADEMY

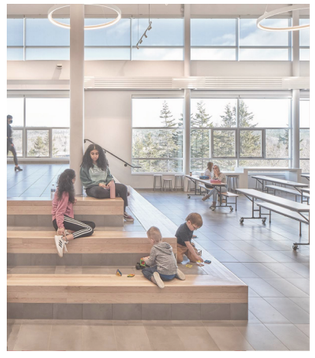
Sheet Harbour, Nova Scotia

Capacity: 275 students
Size: 6,317 sq.m.
Built: September 2020
Cost: n/a
Built Type: new build



Notches in the façade often highlight significant interior elements such as stairwells, entrances, or makerspaces. This articulation also breaks down the building's monolithic form, introducing a more human scale.

Fig. 3.20 Exterior façade' with notches at Marine Drive Academy



Stairs are used to create a natural separation between spaces, with the upper level functioning as a stage and the lower as a cafeteria. Informally, the stairs also serve as a place for socialization and play, their convenient proportions making them ideal for sitting.

Fig. 3.21 Cafeteria and learning steps at Marine Drive Academy

Marine Drive Academy is organized around spaces of making, designed to promote creativity and discovery as central to the learning process.[88] Located on a steep coastal site, the three-storey building navigates the terrain with ascending corridors and pathways, while windows and thresholds frame impressive views of Sheet Harbour.[89] The 'L' shaped building was programmatically designed to contain large programs, such as the gym, music, and drama areas, on the short side, while the long side holds classrooms.[90] As a K–12 school, each level is arranged for a different age group: middle grades on the lower level, elementary on the main floor with direct courtyard access, and high school students on the upper level near science, textile, and nutrition labs.[91] Classrooms are notched along "learning streets," connected vertically by lightwells that link all three floors. Collaboration spaces throughout the learning streets provide flexible learning environments, featuring sliding glazed partitions, adjustable furniture, and accessible outlets.[92] Centrally located maker spaces and communal rooms reinforce project-based, hands-on learning while fostering collaboration and community across age groups.

88 "Marine Drive Academy," https://www.fbm.ca/projects/marine-drive-academy.

89 "Marine Drive Academy."

90 Elsa Lam, "Making the Grade: Marine Drive Academy, Sheet Harbour, Nova Scotia," *Canadian Architect*, September 1, 2021, https://www.canadianarchitect.com/making-the-grade-marine-drive-academy-sheet-harbour-nova-scotia/.

91 Lam, "Making the Grade."

92 Lam, "Making the Grade."



Connected to classrooms by slidding glass partition walls, corridor spaces act as collaborative learning hubs, allowing groups to gather, work on projects, and create collectively.

Equipped with sinks and pull-down outlets, these areas support a wide variety of subjects, from art to science, making them highly adaptable learning environments.

Transparent connections to classrooms, high ceilings and skylights fill learning streets with natural light, creating spaces that feel open, bright, and inviting to use.

Fig. 3.22 Collaboration workshop space at Marine Drive Academy

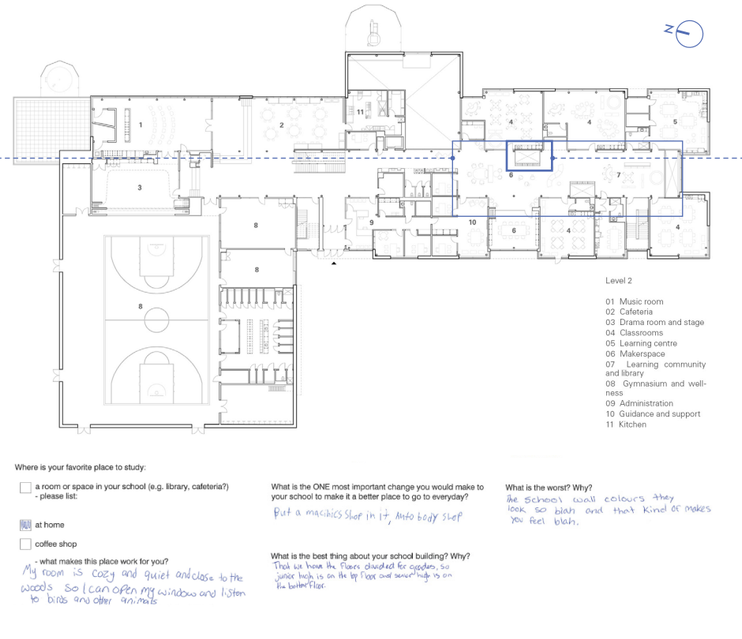
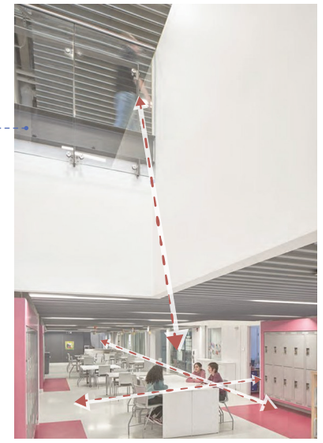


Fig. 3.23 Second floor plan of Marine Drive Academy & pre-design student engagement activity



Lightwells create strong connections between floors, linking different age groups both visually and socially.

Fig. 3.24 Lightwells connecting levels in corridors at Marine Drive Academy

hcma architecture + design

Capacity: 1,300 students
Size: 17,700 sq.m.
Built: September 2015
Cost: ~ $52.5 million
Built Type: new build

A large canopy and plaza at the entrance create a welcoming, human-scaled space for gathering and socializing, both before and after school, with ample shade.

Clear signage around the entrance directs the community to key amenities such as the daycare, fields, and theatre, ensuring the building is easy to navigate.

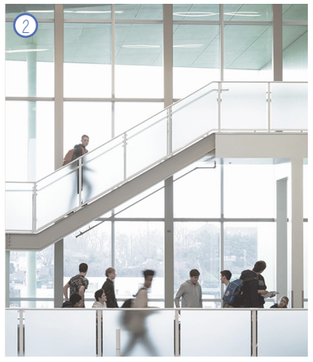
Colors were carefully selected to both reflect the school's identity and harmonize with the surrounding context.

OAK BAY HIGH SCHOOL

Victoria, BC



Fig. 3.25 Main entrance of Oak Bay High School



Niches are integrated throughout the corridors, often within double-height transparent spaces, giving students the freedom to work and socialize in areas that remain visually connected.

Fig. 3.26 Collaboration space and stairs at Oak Bay High School

For this case study, I can include insight from my personal experience: Oak Bay was my high school, and I had the privilege of being part of the first grade 9 class to occupy the new building. Located in a residential neighbourhood, the two-storey building is designed to support both 21st-century educational needs and its surrounding community. Just a block away from the local community centre, the architects partnered with local organizations to support teen programs, a daycare, and other activities within the Neighbourhood Learning Centre.[93] Within the building, main corridors circulate around the theatre and gymnasium, with double-height atrium spaces providing visual and programmatic connections throughout the building. Features such as social stairs, sittable lockers, and niches create informal spaces for students to socialize and learn. The varied scales of these spaces give students options, whether seeking a quieter spot away from activity or a larger area to gather with friends. Classrooms and workshops are highly flexible, with glazed garage doors opening to corridors or the exterior, movable furniture, and partition walls that accommodate multiple learning configurations.

For me, the school almost felt like a university campus, with bright, expansive spaces that never felt restrictive or overly monitored. A great deal of trust was given to students, for example, through the 'focus block,' which allowed us to work independently on a subject of our choice. Combined with the transparency of open spaces, this trust seemed to foster genuine motivation. Many students were driven to do their best work not out of obligation, but because they felt ownership over their learning and a sense of responsibility for their futures.

93 "Oak Bay High School," HCMA Architecture + Design, https://hcma.ca/project/oak-bay-high-school/.

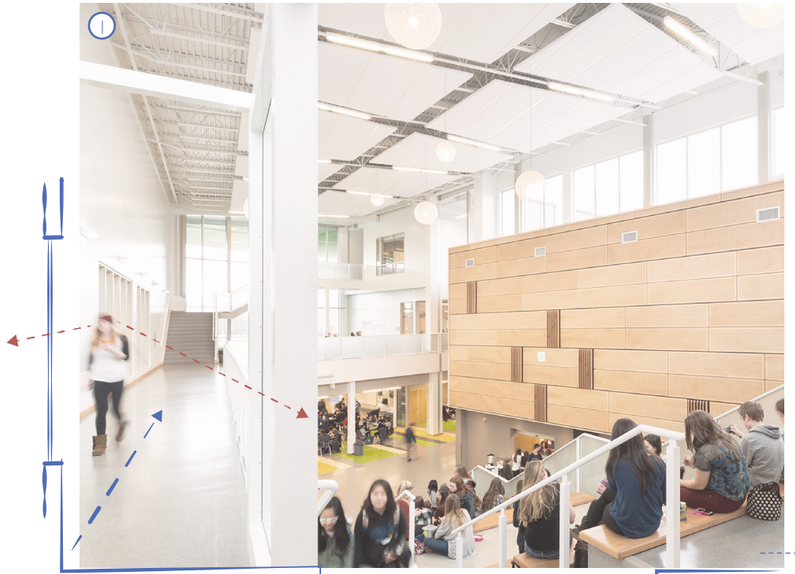
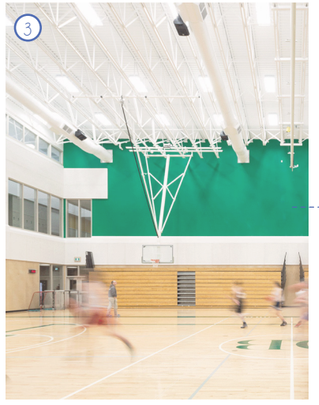


Fig. 3.27 Social stairs with bridge corridor at Oak Bay High School

At the heart of the school, a bridge-like corridor serves as a significant space of connection. Walking between classes in this triple-height space, students can look down into the gymnasium to see major events unfolding, while also catching sight of friends gathering on the social stairs, reinforcing both visual and social connections across the school building scale.

The central wood wall, which encloses the auditorium, defines a primary circulation area and serves as a way-finding element. Skylights introduce abundant natural light while framing carefully considered views within the space.



Reflecting pride in the school's athletic programs, the gymnasiums are visually connected to the corridors through large interior windows. This transparency integrates athletics into the daily life of the school, allowing students to remain engaged with events even while passing by.

Fig. 3.29 Gymnasium at Oak Bay High School

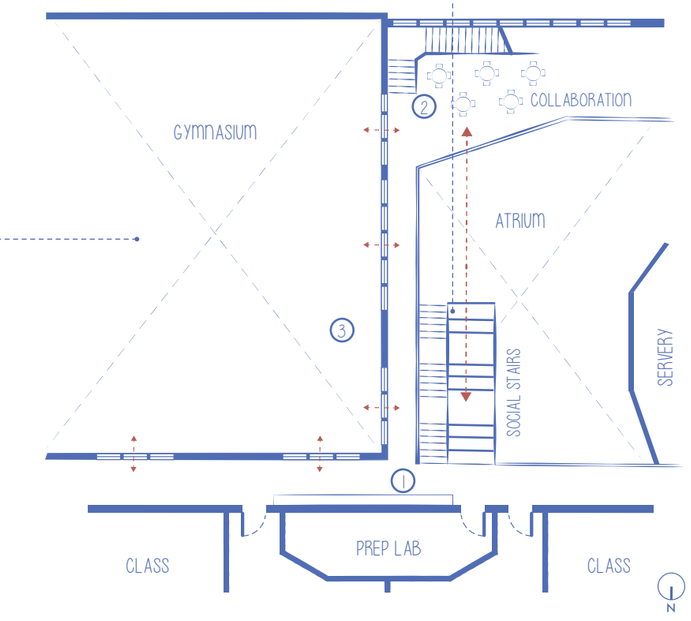


Fig. 3.28 Sketch of atrium and gymnasium connection at Oak Bay High School

LGA Architectural Partners

THORNCLIFFE COMMUNITY CENTRE

Toronto, Ontario

Capacity: n/a
Size: 3,251 sq.m.
Built: February 2011
Cost: ~ $8.4 million
Built Type: adaptive reuse

While the front entrance remained largely unchanged from the original building, the rear was extended with a large curtain wall, creating a direct visual and physical connection between the gymnasium and the active outdoor space.



Fig. 3.30 Outdoor space at Thorncliffe Community Centre



The original building was quite dark and closed off, but the renovation has transformed it into a much more open environment, creating strong programmatic connections between spaces

Fig. 3.31 Daycare corridor at Thorncliffe Community Centre

The final case study, an example of an adaptive reuse project, focuses on the renovation and expansion of the Thorncliffe Community Centre, Child Care, and Library. Initiated by a rapidly growing community with evolving needs, the architects collaborated closely with the community, local councillor, advisory board, and three primary clients to create a facility that responds to diverse programmatic requirements.[94] The new child care wing, expanded library, gymnasium, and fitness centre are organized around a central courtyard, which brings natural light into the heart of the building and provides clear sightlines between spaces.[95] Each program area retains its own identity while remaining visually and spatially connected to the rest of the centre. Phased construction minimized disruption, allowing the childcare to remain open and library closures to be brief.[96] Through the careful integration of new elements into the original building, along with the inclusion of ramps and open circulation, the design fosters community interaction while creating a cohesive, engaging hub. The building carefully selects what to preserve and what to replace, demonstrating a retrofit approach that balances respect for the existing structure with the creation of spaces needed by the community.

94 "Thorncliffe Community Centre, Childcare & Library," *LGA Architectural Partners*, https://lga-ap.com/portfolio/thorncliffe-community-centre-childcare-library/.
95 "Thorncliffe Community Centre, Childcare & Library," *LGA Architectural Partners*.
96 "Thorncliffe Community Centre, Childcare & Library," *LGA Architectural Partners*.



Fig. 3.32 Gymnasium with stair seating and ramp at Thorncliffe Community Centre

Since the building was not considered precious or historical, the architects were able to carefully decide what to preserve and what to demolish for structural or programmatic reasons. This selective approach allowed new feature, such as ramps and full extensions, to be added, ensuring the building could fully support the desired programs.

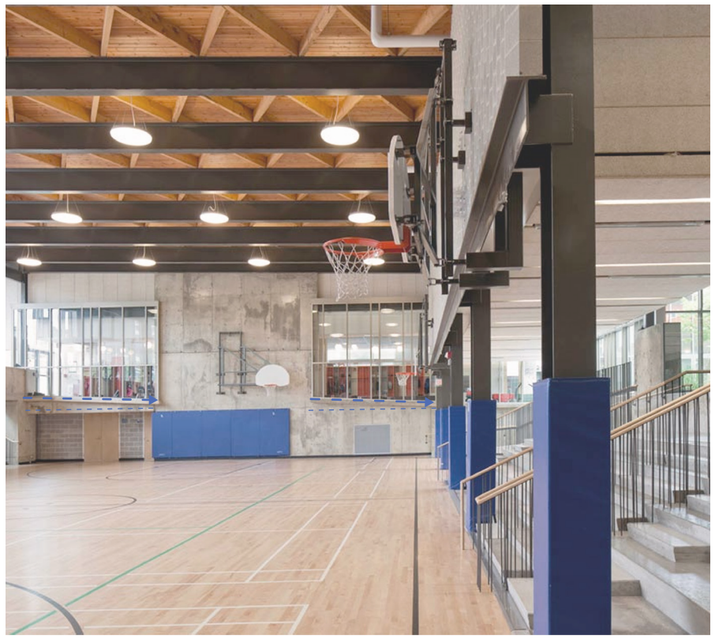


Fig. 3.33 Gymnasium with connecting windows at Thorncliffe Community Centre



The daycare is thoughtfully connected to other parts of the school. Large windows in the gym show the ramps that make the building accessible, and the exterior courtyard is safely enclosed by the rest of the building. Together, these features keep the daycare safe, visible, and connected.

Fig. 3.34 Daycare courtyard space at Thorncliffe Community Centre

3.4 Evidence-Based School Design Considerations

> *The key to this transformation is not to standardize education, but to personalize it to build achievement on discovering the individual talents of each child, to put students in an environment where they want to learn and where they can naturally discover their true passions.*[97]
>
> — Sir Ken Robinson, British author and orator.

Following the analysis of current secondary school conditions within the WRDSB, Section 3.0 explored the everyday challenges students encounter, acknowledging that each learner brings a unique set of needs, abilities, and ways of engaging with their environment. The section then analyzed a range of pedagogical models, extending from the classroom to the community scale, to understand how educational theories can be translated into spatial design strategies. To summarize these concepts, a series of case studies explored schools and community environments that effectively support the needs of 21st-century learners. Key lessons identified primary design considerations based on modern pedagogical practices that establish a foundation for effective secondary school designs. The following list summarizes these takeaways, highlighting recurring strategies observed in successful schools where design and daily function are seamlessly integrated.

1. A Strong Connection Between the School and the Community:

In many of the case studies, the school was an integral part of the urban landscape. When schools are physically and socially connected to their surrounding context, through shared amenities, accessible public spaces, and community-oriented programs, they become active contributors to the life of the neighbourhood. By welcoming the local community onto the site, schools can foster a stronger sense of belonging among students, who begin to see themselves as participants in a larger network. In turn, the school itself gains identity, resilience, and cultural value through its reciprocal relationship with the community it serves.[98]

2. Consideration of the Local Context and Landscape:

Responding to site history and community needs allows for deliberate landscape interventions that establish meaningful visual and physical connections to the outdoors. On expansive sites, thoughtfully designed landscapes can serve a dual purpose: providing accessible green space for the wider community while acting as a living classroom that encourages environmental awareness, hands-on learning, and stewardship among students.

97 Sir Ken Robinson, Forward. Hudson and White, *Planning Learning Spaces: A Practical Guide for Architects, Designers and School Leaders*.

98 Care et al., *Building Schools: Key Issues for Contemporary Design*, 90.

3. Sustainable, Efficient and Durable Design:

Although school design is often constrained by frameworks, standards, and building codes, good design not only meets these requirements but exceeds them.[99] Through the careful selection of materials, the integration of passive systems, and thoughtful design strategies, the case studies redefine what constitutes a "good school." To guide this level of ambition, performance frameworks such as LEED (which emphasizes environmental responsibility) and WELL (which prioritizes occupant health and well-being) offer valuable tools for shaping intentional spaces that promote sustainability, enhance comfort, and support the overall health of students.[100] It is important to recognize that these are only frameworks; on their own, they do not guarantee "good" or truly sustainable design.

4. Allowing Learning Outside of the Classroom:

Many of a student's most meaningful and lasting social interactions occur beyond the classroom.[101] Designing corridors, entrances, landscapes, and even framed views as social spaces encourages learning to extend throughout the entire school environment. As seen, these in-between spaces can become active zones for collaboration, reflection, and informal exchange, creating opportunities for exploration, discovery, and connection that enrich the overall educational experience.[102]

5. Ensuring Each Space is Accessible, Inclusive and Safe:

Each learning space should be designed to accommodate the diverse physical, cognitive, and emotional needs of all students. Accessibility extends beyond mobility, encompassing sensory comfort as well as equitable access to natural light, resources, and technology. Truly inclusive and safe spaces promote dignity and respect through clear and intuitive layouts, adaptable furniture arrangements, and welcoming atmospheres that foster both physical security and psychological well-being.

6. Utilize Flexible Spaces and Equipment:

As explored, change is inevitable. Providing flexible spaces and integrating adaptable equipment enables schools to respond to evolving pedagogies, technologies, and community needs, ensuring long-term relevance and usability.[103] Features such as movable partitions, reconfigurable furniture, and accessible storage enhance spatial efficiency and functionality. At the same time, adaptable environments foster a sense of ownership and agency among students, empowering them to shape their learning spaces according to their activities and needs.[104]

99 Pamela Woolner, *The Design of Learning Spaces: Future Schools* (Continuum International Publishing Group, 2010), 12.

100 WELL, "WELL Standard," https://v2.wellcertified.com

101 Hudson and White, *Planning Learning Spaces: A Practical Guide for Architects, Designers and School Leaders*, 45.

102 Care et al., *Building Schools: Key Issues for Contemporary Design*, 131.

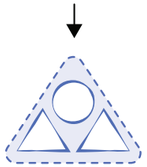
103 Woolner, *The Design of Learning Spaces*, 13.

104 Hudson and White, *Planning Learning Spaces: A Practical Guide for Architects, Designers and School Leaders*, 116.

TRADITIONAL
ARCHITECTURAL PROJECT:



1 Start with a program idea



2 Design the structure to support

RETROFIT PROJECT:



1 Start with the existing structure



2 Determine new needed programs



3. Adapt existing structure to support the new programs

3.5 A Case for Reuse and Adaption

While the schools examined in the case studies collectively demonstrate and redefine what constitutes a "successful" school, one important consideration is notably absent yet strongly advocated for in this thesis, particularly in Ontario's context: the principles of reuse and adaptive design. Although not a secondary school project, LGA's Thorncliffe Community Centre offers a compelling example of successful adaptive reuse within a closely related typology, demonstrating how community-oriented programs can be revitalized through thoughtful design.

Unlike some heritage buildings, post-war secondary schools in Ontario are not inherently "precious." Their historical significance is limited, and with few exceptions, their architectural features are unremarkable. These qualities make the buildings ideal candidates for adaptive reuse: spaces can be selectively retained, modified, or expanded as needed, while elements without functional purpose can be removed to accommodate new programs and requirements. The process, however, can be complex and time-consuming. A successful design begins with a comprehensive assessment to determine which components should be preserved for structural or operational reasons and which can be reconfigured. This stage is critical for evaluating safety concerns, such as identifying walls that contain hazardous materials like asbestos. The careful planning required during assessment continues into construction, where demolition must proceed slowly and precisely. Despite its challenges, this process is worthwhile. Buildings carry not only embodied carbon but also embodied memory and cultural impact; preserving both sustains a deeper continuity between past and future learning environments.[105]

The adaptive reuse approach is particularly well-suited for secondary schools in Ontario. As noted in Section 2.1, the *Waterloo Region District School Board: Secondary Boundaries Updated Review (2015)* identified the need for at least one new secondary school within five years in the southwest Kitchener area to accommodate enrolment growth.[106] Despite this recognized need, the City Council and the WRDSB have been unable to secure a suitable site large enough to support a new secondary school.[107] Increasing urban density has made land availability a significant challenge, especially for schools, whose traditional typology requires extensive field space and a central location within communities. Land also typically yields little profit, further discouraging development. The WRDSB already operates sixteen secondary schools situated on generously sized sites.[108] Rather than pursuing new construction, the school board could focus on better utilizing and adapting assets they already possess.

105 "About Us," *LGA Architectural Partners*, https://lga-ap.com/about-us/.

106 Watson & Associates Economists Ltd., *Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review* (Mississauga, ON, 2015), vii.

107 Jeff Pickel-CTV Kitchener, "Public Board Redrawing Feeder School Boundary Maps in Kitchener to Alleviate Overcrowding," CTVNews, November 19, 2019, https://www.ctvnews.ca/kitchener/article/public-board-redrawing-feeder-school-boundary-maps-in-kitchener-to-alleviate-overcrowding/.

108 Watson & Associates Economists Ltd., *Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review*.

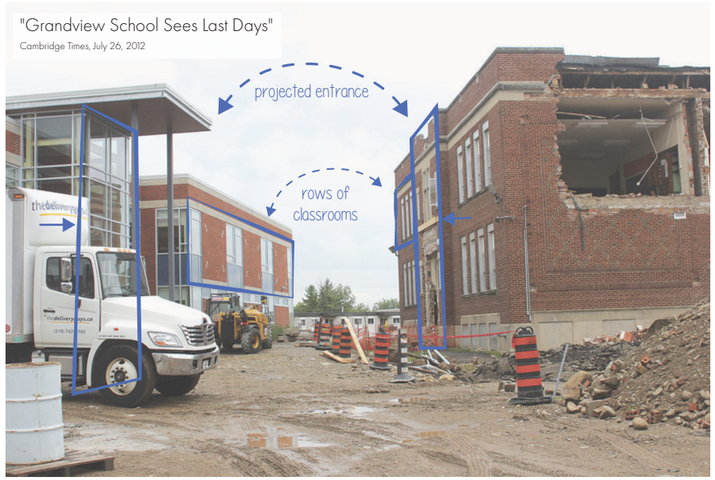


Fig. 3.35 Demolition of Grandview Public School in the WRDSB to make way for the new school being constructed right next door

The layout and exterior identical placement of exterior features makes me question. is the new building really that different from the old? Or, could the old be adapted to enhance existing conditions?

Reusing the site alone, however, is not sufficient. In the case of Grandview Public School in Cambridge, Ontario, the WRDSB opted to demolish the existing building to construct a new facility. The refurbishment of the old building was estimated at $4.6 million, while the new building was projected to cost $7 million.[109] The replacement was positioned in a less desirable location on the site; the original school was situated on the top of a grand hill overlooking the river, lending it both presence and connection to the landscape. The new building also did not depart meaningfully from the traditional "cells and bells" typology, offering little modern pedagogical or spatial innovation. The surplus of funds with a refurbishment approach could have instead been directed toward upgrading another school or transforming the existing space into a 21st-century learning environment.

School renewal in Ontario cannot be approached on a school-by-school basis; efforts toward renewal must be implemented on a provincial scale. If an additional $2.6 million were spent on each school, the broader re-adaptation of our educational system would become financially unsustainable. The existing post-war secondary school buildings already contain robust and serviceable structures. If the structure and systems already exist—as they do in most post-war schools—and only require targeted replacement or expansion, a much greater portion of the budget could instead be allocated to enhancing interior environments, landscape design, and community integration. While the technical details and logistics of this process extend beyond the scope of this thesis, the argument for adaptive reuse remains essential; this will be explored at a schematic level in the following section.

109 Cambridge Times, "New Future for Grand View," Cambridge Times, March 10, 2010, https://www.cambridgetimes.ca/news/new-future-for-grand-view/article_962f7950-2528-50c5-9f21-25e7566df770.html.


Opened in 1929, Oak Bay's old high school meets its end

In the case of Oak Bay High School, the new building successfully integrated 21st-century learning concepts into its design; however, the project also resulted in the loss of a structure rich in both memory and embodied carbon.

Fig. 3.36 News article of Oak Bay's old high school, which no longer met seismic standards, being demolished

According to the Building Our Schools, Building Our Future (2010) report, structure and finishes should account for 48% of a new secondary school's construction budget, not including soft costs. Mechanical and electrical systems comprising another 42% and site development the remaining 10%.[11]

11 *Building Our Schools, Building Our Future: A Report from the Expert Panel on Capital Standards* (Expert Panel on Capital Standards, 2010), 50.

ADAPTING/
RETROFITTING/
EXPANDING/

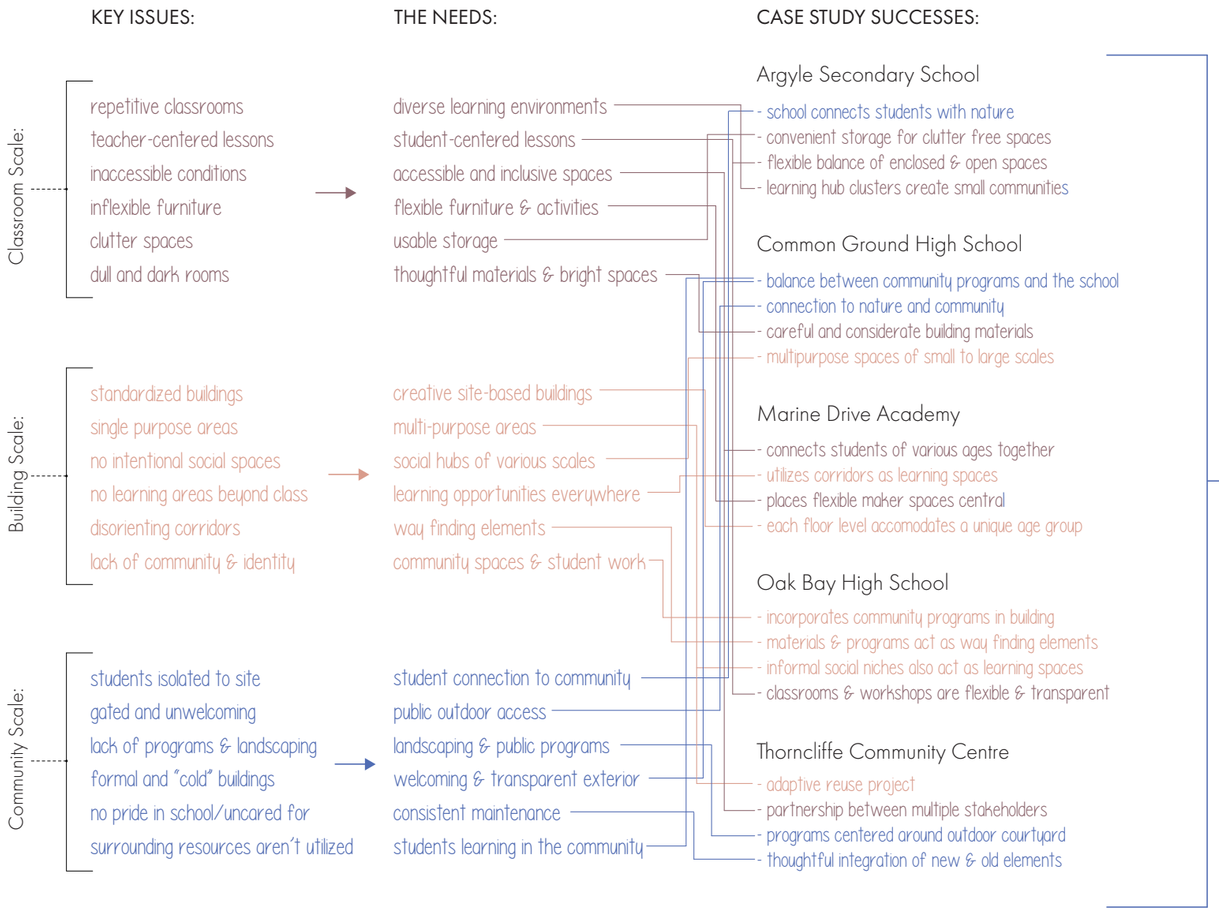
4.0 A DESIGN GUIDEBOOK FOR REIMAGINING SCHOOLS

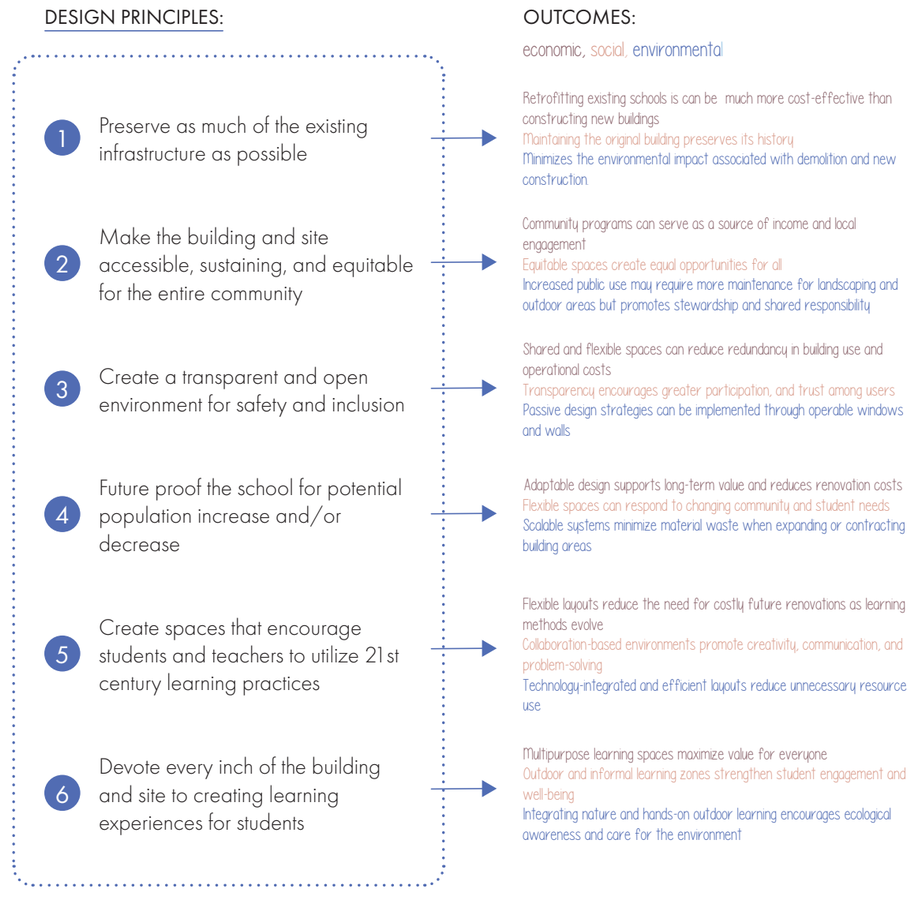
EXISTING

4.1 Design Principles

Change within the education system requires informed yet bold actions. Serving as the rationale for change, Section 2.0 examined the key issues within Ontario's existing schools, identifying the architectural barriers that hinder the creation of quality learning environments. It also addressed systemic barriers within the Ontario Ministry of Education (OME), highlighting how provincial policies and frameworks influence the conditions and performance of individual schools. Section 3.0 then provided direction for where change is needed, exploring the diverse needs of students and translating them into theory-based spatial adaptations across classroom, building, and community scales, supported by real-world case studies.

Building on these foundations, Section 4.0 moves from analysis to action by introducing explorative design strategies for reimagining Ontario's post-war secondary schools. These strategies focus on areas most in need of transformation and are directly informed by student experience. Drawing from the insights of earlier sections, the chapter consolidates findings into a set of key design principles offering adaptable guidance for architects, designers, and school boards. Rather than serving as rigid prescriptions, these principles form a flexible framework that can be tailored to the unique context of each school and community. Overall, Section 4.0 acts as a guidebook for change, translating research into bold, actionable recommendations for renewing post-war secondary schools.





4.2 Existing School Conditions



Fig. 4.1 Map highlighting the City of Waterloo



Fig. 4.2 Map highlighting Northdale neighbourhood



Fig. 4.3 Map highlighting Waterloo Collegiate Institute (WCI) site

While this chapter serves as a general design guidebook for reimagining post-war secondary schools in Ontario, this thesis also applies the proposed design principles to a specific building and site. The design for this school is schematic, but it was deemed essential to include to demonstrate how a methodical process of adaptive reuse and addition can be achieved. The design process begins with an in-depth analysis of the existing building, identifying which elements should be retained and which should be modified to meet the new goals of the school. While the specific design decisions may not be universally applicable, the value lies in the process itself; the sequence of steps, the rationale behind each decision, and the ideas that inform the creation of a 21st-century learning environment.

From the catalogue of secondary schools presented in Section 2.4, the school selected within the Waterloo Region District School Board (WRDSB) for analysis, and to serve as the foundation for the design guidebook, is Waterloo Collegiate Institute (WCI). This school, which has been the subject of ongoing discussions about redevelopment and adaptation since 2012, has seen little to no change in the last 25 years. At the city scale, WCI is centrally located within the educational district, positioned between the University of Waterloo main campus and Wilfrid Laurier University. With the rapid development of student housing around the site, the community has undergone a significant demographic shift since the school's construction in 1959.[1] Once a low-rise, family-oriented neighbourhood, the area is now dominated by mid- to high-rise developments and populated primarily by young adults, including university students and early-career professionals.

Recognizing the potential of this site, the *Northdale Land Use and Community Improvement Plan Study* (2012) introduced urban design and built form guidelines for the area, including outlined recommendations for better integrating the WCI site with its surrounding community.[2] The study notes that:

> *The potential future redevelopment or repositioning of Waterloo Collegiate Institute should ensure that the open space components of the campus are maintained for community use, and the campus may redevelop for other educational, recreational or cultural purposes, and/or for mixed residential development with medium to high density uses in a manner compatible with the surrounding neighbourhood.*[3]

1 Watson & Associates Economists Ltd., *Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review* (Mississauga, ON, 2015), 23.

2 The City of Waterloo, "Northdale Land Use and Community Improvement Plan Study," June 2012, https://www.waterloo.ca/en/government/resources/Documents/Cityadministration/Northdale/2012-urban-design-and-built-form-guidelines.pdf.

3 The City of Waterloo, "Northdale Land Use and Community Improvement Plan Study," 11.

Following the *Northdale Land Use and Community Improvement Plan Study* (2012), Wilfrid Laurier University, the City of Waterloo, and the WRDSB collaborated on a 2016 feasibility study to reimagine the WCI site as a "Community Hub."[4] Occupying approximately 17% of the Northdale neighbourhood, the study identified opportunities for redevelopment and outlined strategies intended to benefit multiple stakeholders. Among its key recommendations was the proposal to subdivide the site to accommodate the needs of all three parties. This included the creation of a larger, modernized secondary school capable of serving more students, complemented by shared interior and exterior spaces accessible to the community, as well as co-working office facilities.[5] The study explored several configuration options for the site, ranging from a complete demolition and reconstruction to partial preservation of the existing school building. However, none of the proposed redevelopment plans were completed.

From the WRDSB's perspective, the *Secondary Boundaries Updated Review* (2015) noted that WCI is located in close proximity to two other secondary schools, resulting in overlapping walkability boundaries.[6] Despite this, WCI continues to attract a significant number of students from outside its designated catchment area, largely due to its specialized programs. The report, however, projected a long-term enrolment decline to below 1,000 students and utilization rates under 80%.[7] In contrast, nearby schools such as Bluevale Collegiate Institute were expected to experience enrolment growth and have recently benefited from multiple upgrades and renovations. Whether due to funding limitations or uncertainty surrounding WCI's long-term enrolment trends, the WRDSB has shown little urgency to redevelop or improve the school since the feasibility study. Still, the site demonstrates a great potential to serve as a valuable community asset. However, redevelopment of the existing building presents many challenges, particularly concerning accessibility, which will be examined in greater detail.

While the numerical assessment of WCI ranked it as one of the weaker schools I visited, due to issues such as overcapacity, overlapping walkability radius with neighbouring schools, numerous repair needs, and accessibility challenges, the experience of walking through it was one of the best. The ends of the corridors were bright and filled with natural light from large windows, the half-level structure added a dynamic spatial quality, and the flexibility for students and teachers to adapt their spaces was impressive. They had even transformed part of the cafeteria into a fitness area! The energy of both teachers and students was vibrant, and the building itself was full of character. It felt like a place filled with memories worth preserving and adapting to meet new needs.

4 Waterloo Region District School Board et al., *WLU/WCI Feasibility Study*, Feasibility Study (2016), https://www.wrdsb.ca/planning/wp-content/uploads/sites/5/WLU-WCI-Feasibility-Study-Final-Deliverable-Print-Readyreduced-2.pdf.

5 Waterloo Region District School Board et al., *WLU/WCI Feasibility Study*, 7.

6 Watson & Associates Economists Ltd., *Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review*, 24.

7 Watson & Associates Economists Ltd., *Waterloo Region District School Board (WRDSB): Secondary Boundaries Updated Review*, 23.

The population in the City of Waterloo was 678,170 in 2024 and is expected to reach 923,000 by 2051. It is the 2nd fastest growing metro city in Canada. Students & young families make up majority of the population with the low cost of living & high quality of life. [12]

12 "Demographics," January 29, 2018, https://www.regionofwaterloo.ca/en/doing-business/demographics.aspx.

The vision statement for Northdale's future reads: "By 2029, Northdale is revitalized and reurbanized into a diverse, vibrant and sustainable neighbourhood, integrated with educational, residential, commercial, cultural, heritage and recreational functions, and improved open space, pedestrian, cycling and transit networks." [13] Given that the school occupies a significant portion of the neighbourhood (approximately 17%), it should play a central role in realizing this vision.

13 The City of Waterloo, "Northdale Land Use and Community Improvement Plan Study," June 2012, https://www.waterloo.ca/en/government/resources/Documents/Cityadministration/Northdale/2012-urban-design-and-built-form-guidelines.pdf.

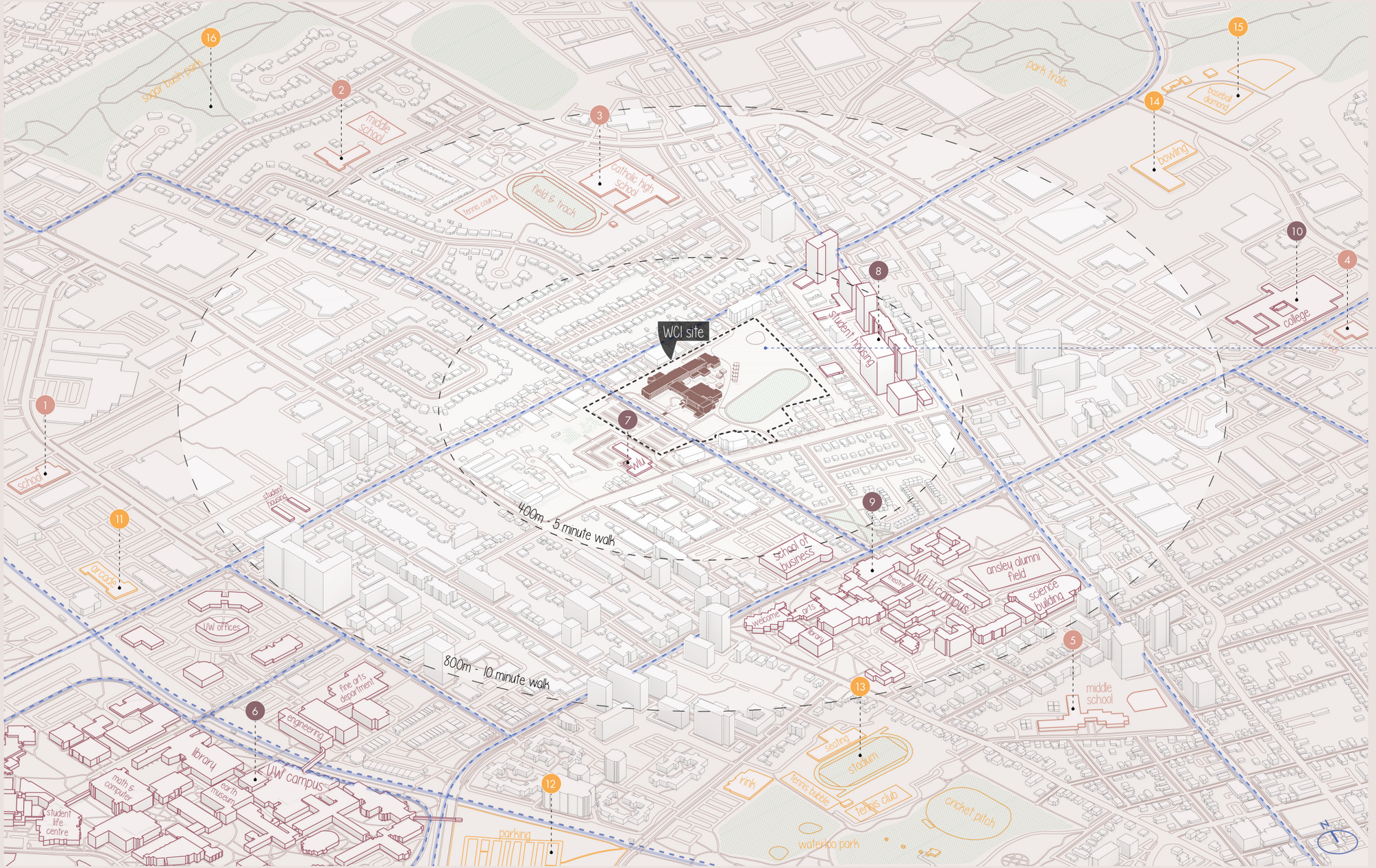


Fig. 4.4 Schools, universities, colleges and recreational infrastructure around WCI

WCI is surrounded by numerous amenities, including theaters, pools, and soccer fields. However, most of these are owned by the University of Waterloo or Wilfrid Laurier University. While these neighboring campuses offer great potential for connection, secondary students and community members also need a hub of their own, one that does not rely on access to private university facilities. The WCI site has the potential to become a public community hub, providing a 24/7 accessible space where students and community members can gather, enjoy amenities, and connect with one another.

Compared to the rest of the immediate neighborhood, this site is quite large and filled with potential.

LEGEND

NEIGHBOURING SCHOOLS

1 St. Jude's School
2 Winston Churchill Public School
3 St. David Catholic Secondary School
4 WRDSB Summer School
5 MacGregor Senior Public School

UNIVERSITY & COLLEGE SPACES

6 University of Waterloo Campus
7 Wilfrid Laurier University MIE Building
8 Student Housing Collective
9 Wilfrid Laurier University Campus
10 Conestoga College

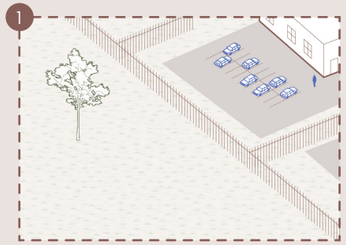
RECREATIONAL

11 Virtual Reality Arcade
12 Waterloo Park
13 University Stadium
14 Bowling Alley
15 Hillside Park
16 Sugarbush Park

Walking Radius
Bus Routes

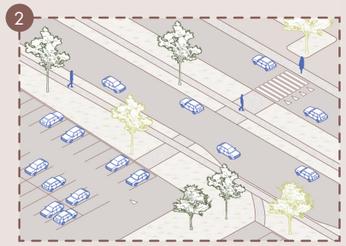


Fig. 4.5 Existing site analysis



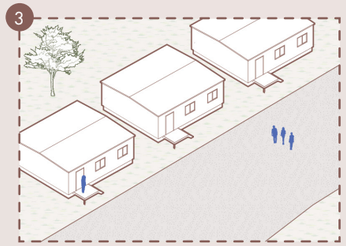
FENCING AROUND PRIVATE LOTS

The surrounding lots are blocked from the school property with continuous fencing for privacy reasons. With the lack of landscaping, this fencing makes the poorly maintained school site feel isolated and uninviting to the surrounding community.



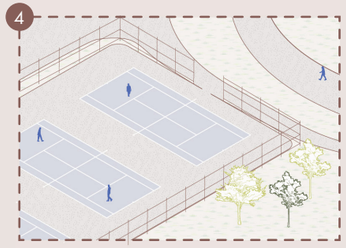
VEHICLE PRIORITIZED ENTRANCE

The main entrance is located on a quiet street designed primarily for vehicle access. With the drop-off zone and student parking directly across the street, experience of arriving at the school feels diminished. The cars and lack of social spaces leave little opportunity for pause, gather, or socialize.



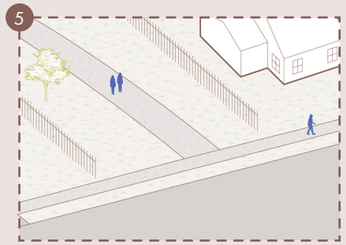
PORTABLE CLASSROOMS

A large part of the site is occupied by portable classrooms, which not only takes up open space but also create a physical disconnect between students and the main building. This separation can make students feel excluded and complicates circulation across the site.



RECREATIONAL ACTIVITIES

Recreational amenities such as a tennis court and track are included on site. While valuable for students and the community, they appear dull and poorly maintained, all needing upgrades. Additional amenities, such as a dog park, could also be introduced to better serve community needs.



SITE ACCESS

Access to the site is often hidden and easy to overlook, tucked between the fences of private lots. The entry points themselves are uninviting and lack any sense of excitement or engagement.

EXTERIOR CONDITIONS

The school's entrance is in good condition, featuring modern architectural elements such as the covered porch and stained glass window framing that stand out as key parts of its identity

The presence of stairs shows that the building lacks proper mobility accessibility

The formality and symmetry of the landscaping gives the building an unapproachable appearance to the wider community



Fig. 4.6 Waterloo Collegiate Institute front entrance

This school was officially designated by the government as needing renewal in 2016. However, repairs have been limited, overlooking urgent issues like accessibility, student comfort, and community integration.

While the sign indicates that change is on the way, the effort is minimal compared to what is truly necessary. At the same time, the sign risks being misunderstood as branding the school as "bad."







The classroom facade shows wear and the repetition in the floor plan.

In 2024, the WCI solar panels generated 10,833 kWh, saving the school $8,688.17 in energy.[14]

[14] "SolarVu Solar PV Monitoring - Waterloo Collegiate Institute - Waterloo, ON," accessed August 14, 2025, https://www.waterlooci.solarvu.net/green/solarVu.php?dr=waterloo-ci&ac=waterlooci.

Fig. 4.7 Top: Ontario *School Facility Renewal Project* sign. Bottom left: south facade classroom windows. Bottom right: south facade solar panels

The basement windows create an interesting visual connection, allowing people outside to look down into the workshop areas.



The library is a recent addition to the school and features a noteworthy façade. However, there is no accessible exit from the library to the outside, preventing students from using the pleasant treed area nearby.

The building includes interesting notched areas along the façade that have the potential to become courtyard spaces with landscaping and outdoor seating.





Fig. 4.8 Top: exterior basement window looking into workshop space. Bottom left: courtyard space with tree. Bottom right: exterior view of library space



The large vertical windows create special moments in the façade and clearly indicate where the stairwells are located throughout the building.

The entrance canopies are very small, and there are no seating areas, which discourages students from hanging out in this space.

Fig. 4.9 South stairwell exterior glazing

Portable classrooms place students in challenging situations. In winter, they may have to walk through cold, snowy conditions multiple times a day to reach their learning environment. The lack of accessibility further limits participation in these spaces.



Fig. 4.10 Entrance of a portable classroom on site



The back of the building serves as the main circulation route for students accessing portable classrooms and sports fields. However, it also functions as staff parking and garbage storage, creating an unpleasant and uninviting location for student movement.

This façade reveals the layered history of the building, displaying the various additions and modifications made over time.





Although the school building and site have remained largely unchanged, the surrounding urban fabric is evolving, with many new developments focused on university student housing.

Lots of key site space is occupied by the portable classrooms

Fig. 4.11 Top: back of school condition. Bottom left: rows of portable classroom. Bottom right: sports field and surrounding developments

ENVELOPE CHALLENGES

Like the front entrance, the large stairwell windows contribute to the school's architectural identity. The light that they let into the stairwell is also significant to the interior. However, these stairwell spaces are only used momentarily by students...

This raises the question of whether it is worth having such large windows, given their potential for substantial heat loss in winter and heat gain in summer, particularly since many are south facing.



The steel column's caulking displays multiple damaged layers, highlighting a lack of maintenance. These layers act as temporary fixes rather than lasting solutions.

The foundational concrete shows signs of weathering/ vehicle damage and staining from the columns above, creating an impression that the structure is poorly maintained.





Fig. 4.12 Top: east stairwell exterior glazing. Bottom left: caulking around structural steel framing and foundation. Bottom right: weathering of exterior foundation



The reason for the blocked north-facing windows is uncertain, though it may relate to efforts to minimize heat loss, improve thermal comfort or even an aesthetic choice.

With minimal covering, these large steel structural columns act as significant thermal bridges for the building.

Fig. 4.13 West facade structural steel framing

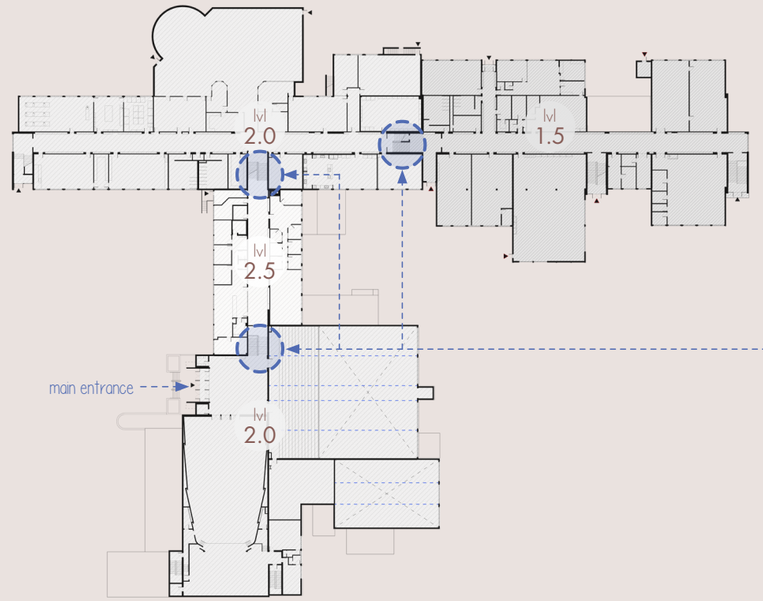
HALF LEVEL CHANGES



Fig. 4.14 Exterior view of half level changes

The half-levels do not limit the building's use; in fact, they add interest and respond well to the site's topography. At the same time, strategies are needed to ensure the building is physically accessible to everyone.

One of the most significant challenges of the WCI building lies in its series of half-level differences between floor plates. Upon entering the school, individuals must immediately climb stairs to reach the main office or any classroom, making the building entirely inaccessible. The school consists of four distinct sections at varying elevations, connected primarily by three stairways, resulting in a configuration that is nearly impossible to make fully accessible. The layout prevents the installation of a single elevator capable of serving all levels. As the WRDSB faces growing pressure to comply with Ontario's accessibility standards, demolition has emerged as a potential solution, particularly in light of the redevelopment strategies outlined in the previously mentioned feasibility study.



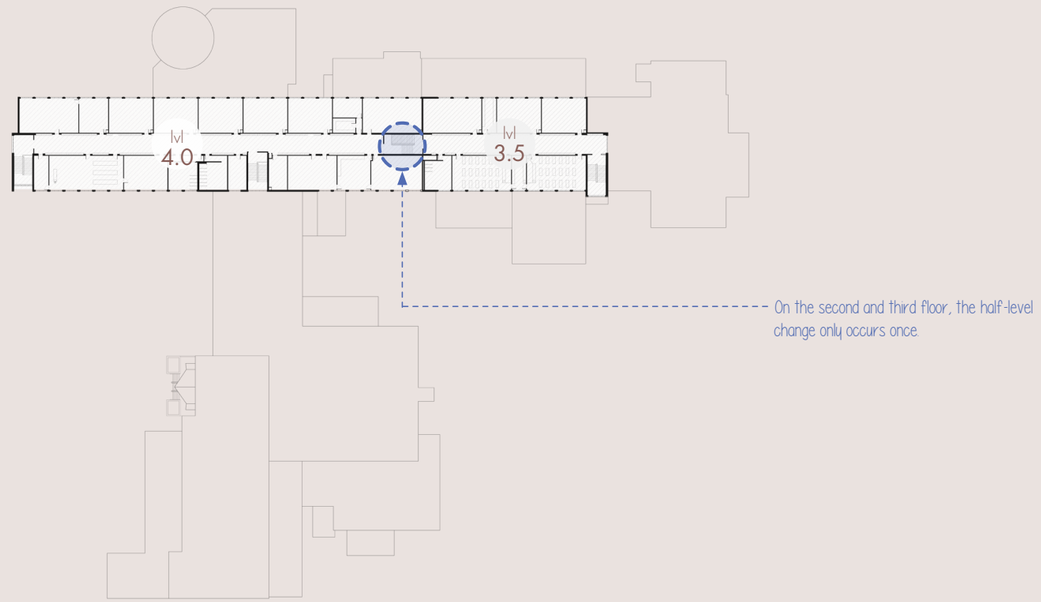


Fig. 4.15 Top: ground floor diagram of existing building half level changes. Bottom: third floor diagram

STRUCTURAL ANALYSIS



Fig. 4.16 Exterior view highlighting structural grid

In the main gym, a steel truss system spans the large open space, clearly expressing the building's structural approach.



Fig. 4.17 Interior view highlighting structural grid

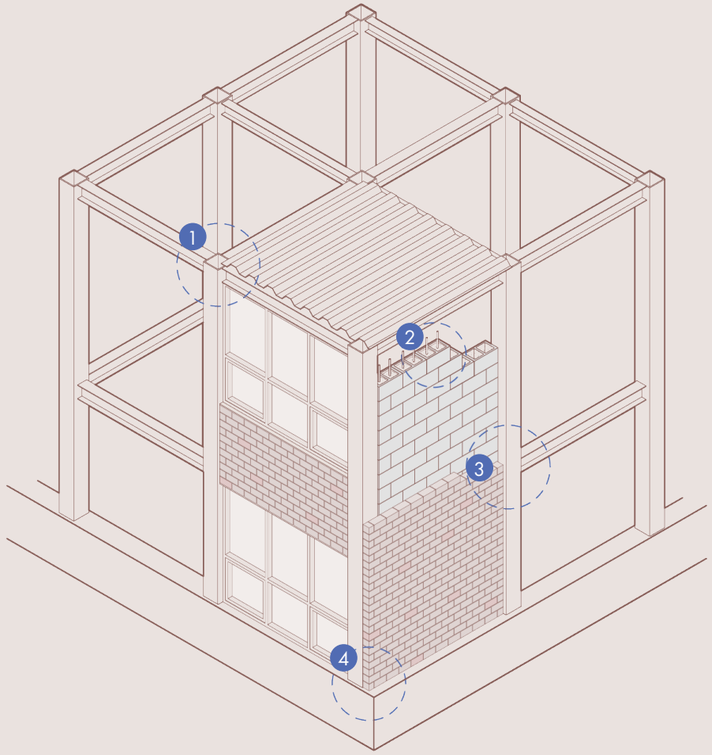


Fig. 4.18 Axonometric of analyzed existing building structural systems

Reflecting the standardized and modular approach typical of Canadian post-war school design, this building is observed to be constructed with a steel-frame superstructure system.[8] The steel beams are visible on the exterior, serving as major thermal bridges. Observations of both the exterior and interior suggest that the building envelope comprises brick on the outside and concrete masonry units (CMU) on the inside. In 1959, when the building was constructed, insulation was generally not included in school buildings, therefore it is assumed that the exterior walls lack insulation.[9] The exposed caulking appears to separate the walls from the steel framing, indicating that the walls are not load-bearing. This structural approach presents challenges, such as the need to improve thermal performance, but also offers opportunities for redevelopment utilizing the non-load-bearing exterior walls and flexible steel-frame system.

8 Susan Ross, "History and Evolution of Public School Design in Ottawa," *Ottawa School Heritage*, October 25, 2020, https://ottawaschoolheritage.wordpress.com/2020/10/24/history-evolution-public-school-design/.

9 Dušan Randelović et al., "Improving Energy Efficiency of School Buildings: A Case Study of Thermal Insulation and Window Replacement Using Cost-Benefit Analysis and Energy Simulations," *Energies* 17, no. 23 (2024): 6176, https://doi.org/10.3390/en17236176.

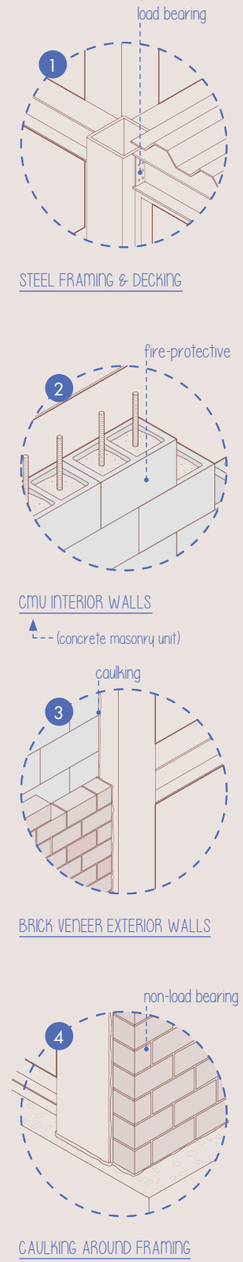


Fig. 4.19 Details of analyzed existing building structural systems

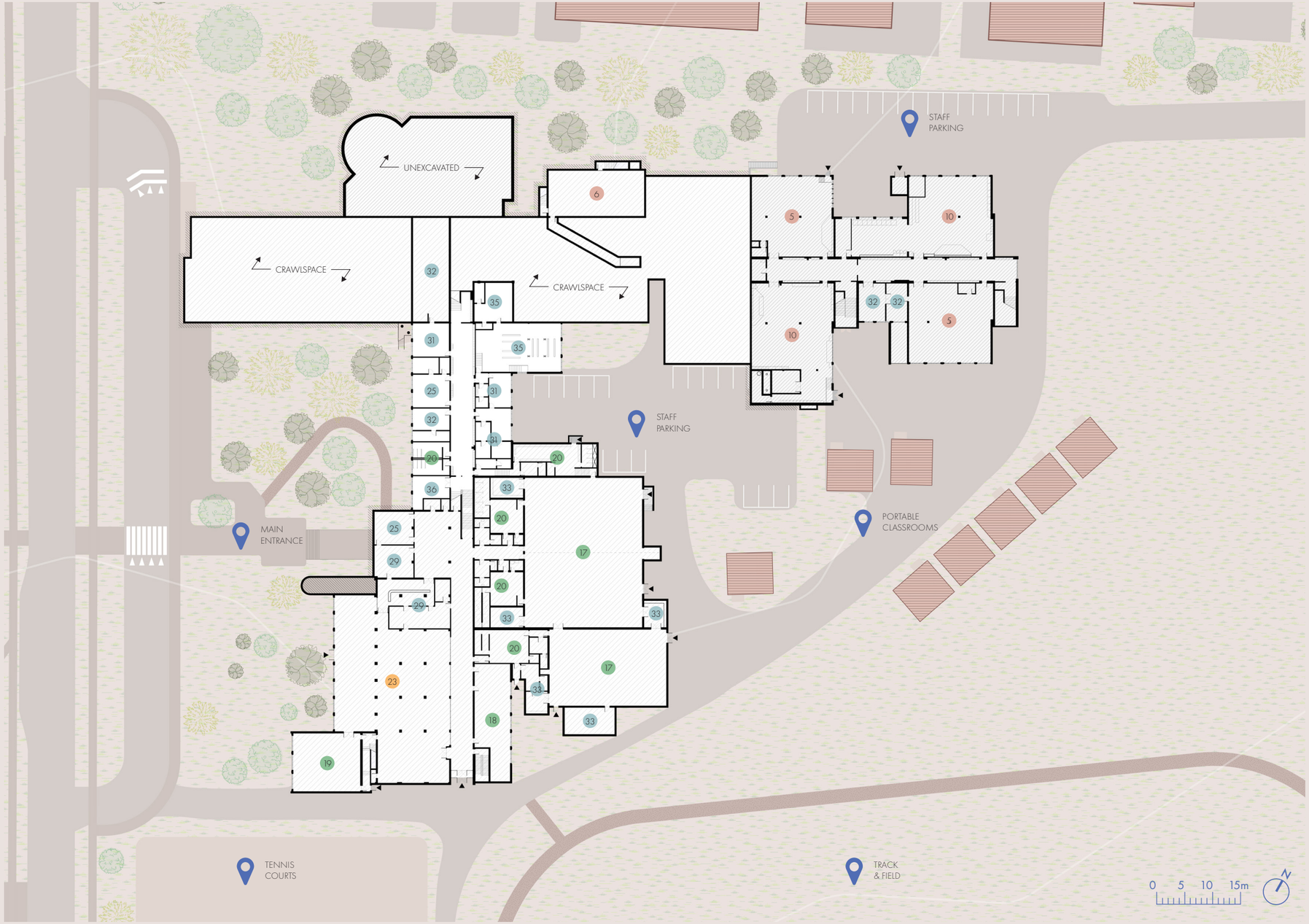


Fig. 4.20 Existing lower floor plan

The basement floor plan accommodates a diverse range of programs, with large workshops located at the partially below-grade north end, administrative offices and service areas in the central wing, and the gymnasiums and cafeteria at the south end. However, the extensive use of solid interior walls makes the basement feel dark, confined, and difficult to navigate, posing challenges for both wayfinding and accessibility. Circulation is further complicated by an unexcavated crawlspace, which requires frequent elevation changes to move between the workshop and athletic areas.

LEGEND

Each type of classroom & workshop are completely separate from one another... What if there was spaces for different classes to collaborate?

CLASSROOMS & WORKSHOPS

1 Classroom
2 Science Lab & Prep Room
3 Business & Computer Lab
4 Seminar Rooms
5 Visual Arts
6 Performing Arts
7 Fashion Studies
8 Food Prep & Theory
9 Technology Lab Small
10 Technology Lab Large
11 Family Studies
12 Music Room
13 Practice Room
14 ESL Classroom
15 Special Education
16 Resource Area

ATHLETICS

17 Gymnasium
18 Fitness Room
19 Aerobics Room
20 Change Room

COMMON SPACES

Almost all programs are purely functional, social and common spaces are limited

21 Foyer
22 Library Resource Centre
23 Cafeteria
24 Auditorium

OPERATIONAL AREAS

25 General Office
26 Guidance Areas
27 Staff & Teacher Work Room
28 Cooperative Education Office
29 Kitchen & Servery
30 Washrooms
31 Custodial Area
32 Academic Storage
33 Gymnasium Storage
34 Fan Room
35 Boiler & Pump Room
36 Electrical Room

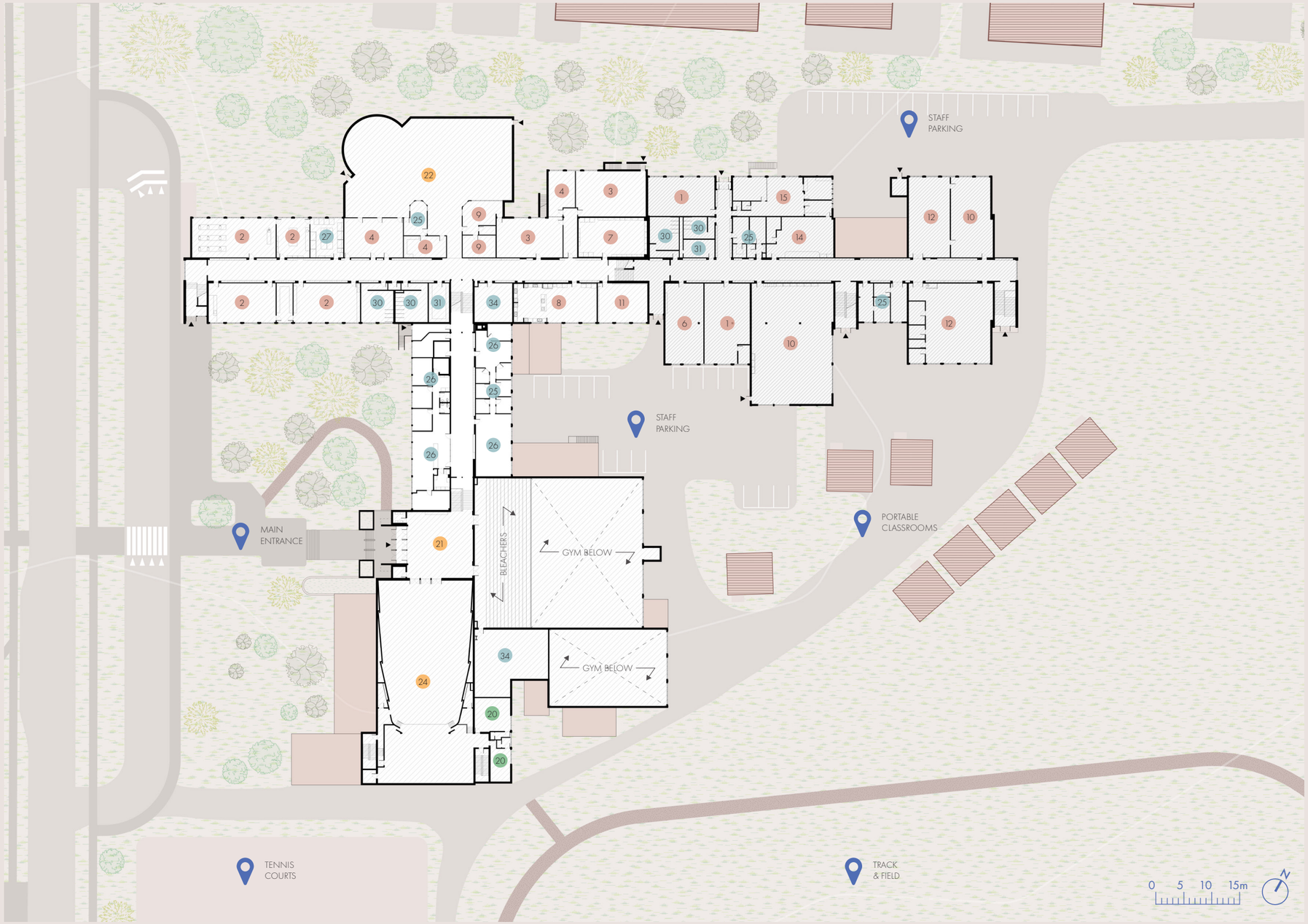


Fig. 4.21 Existing ground floor plan

The ground floor follows a similar organizational layout as the basement, with workshops and classrooms in the north wing, offices and administration in the central wing, and large programs, such as the theatre and main entrance, in the south wing. Circulation on this level is complicated by multiple changes in elevation; although the corridor layout appears straightforward in plan, the vertical transitions make navigation confusing. Additionally, most exterior spaces surrounding the building have weak connections to the interior, with the main entrance as the primary exception, resulting in a limited integration between the site and the building.

LEGEND

CLASSROOMS & WORKSHOPS

1 Classroom
2 Science Lab & Prep Room
3 Business & Computer Lab
4 Seminar Rooms
5 Visual Arts
6 Performing Arts
7 Fashion Studies
8 Food Prep & Theory
9 Technology Lab Small
10 Technology Lab Large
11 Family Studies
12 Music Room
13 Practice Room
14 ESL Classroom
15 Special Education
16 Resource Area

ATHLETICS

17 Gymnasium
18 Fitness Room
19 Aerobics Room
20 Change Room

COMMON SPACES

21 Foyer
22 Library Resource Centre
23 Cafeteria
24 Auditorium

OPERATIONAL AREAS

25 General Office
26 Guidance Areas
27 Staff & Teacher Work Room
28 Cooperative Education Office
29 Kitchen & Servery
30 Washrooms
31 Custodial Area
32 Academic Storage
33 Gymnasium Storage
34 Fan Room
35 Boiler & Pump Room
36 Electrical Room

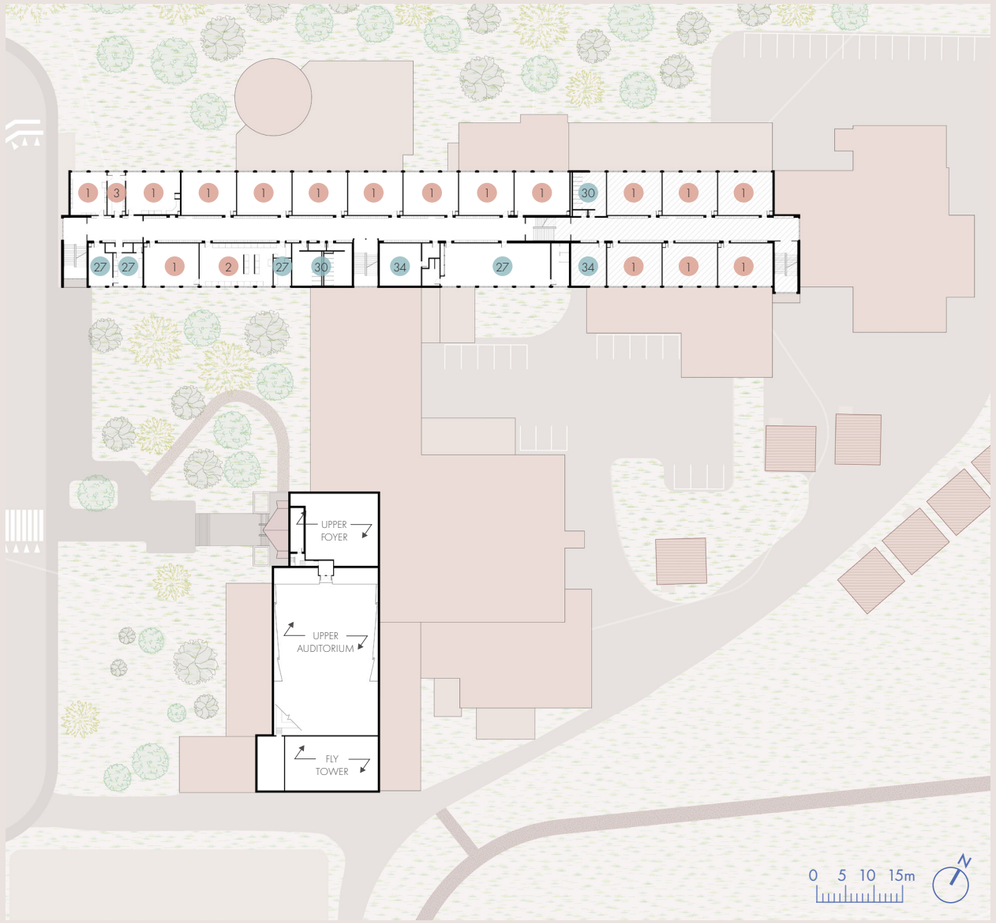


Fig. 4.22 Existing second floor plan

On the upper floor levels, programs are limited to classrooms and operational areas.

LEGEND

CLASSROOMS & WORKSHOPS

1 Classroom
2 Science Lab & Prep Room
3 Business & Computer Lab
4 Seminar Rooms
5 Visual Arts
6 Performing Arts
7 Fashion Studies
8 Food Prep & Theory
9 Technology Lab Small
10 Technology Lab Large
11 Family Studies
12 Music Room
13 Practice Room
14 ESL Classroom
15 Special Education
16 Resource Area

OPERATIONAL AREAS

25 General Office
26 Guidance Areas
27 Staff & Teacher Work Room
28 Cooperative Education Office
29 Kitchen & Servery
30 Washrooms
31 Custodial Area
32 Academic Storage
33 Gymnasium Storage
34 Fan Room
35 Boiler & Pump Room
36 Electrical Room

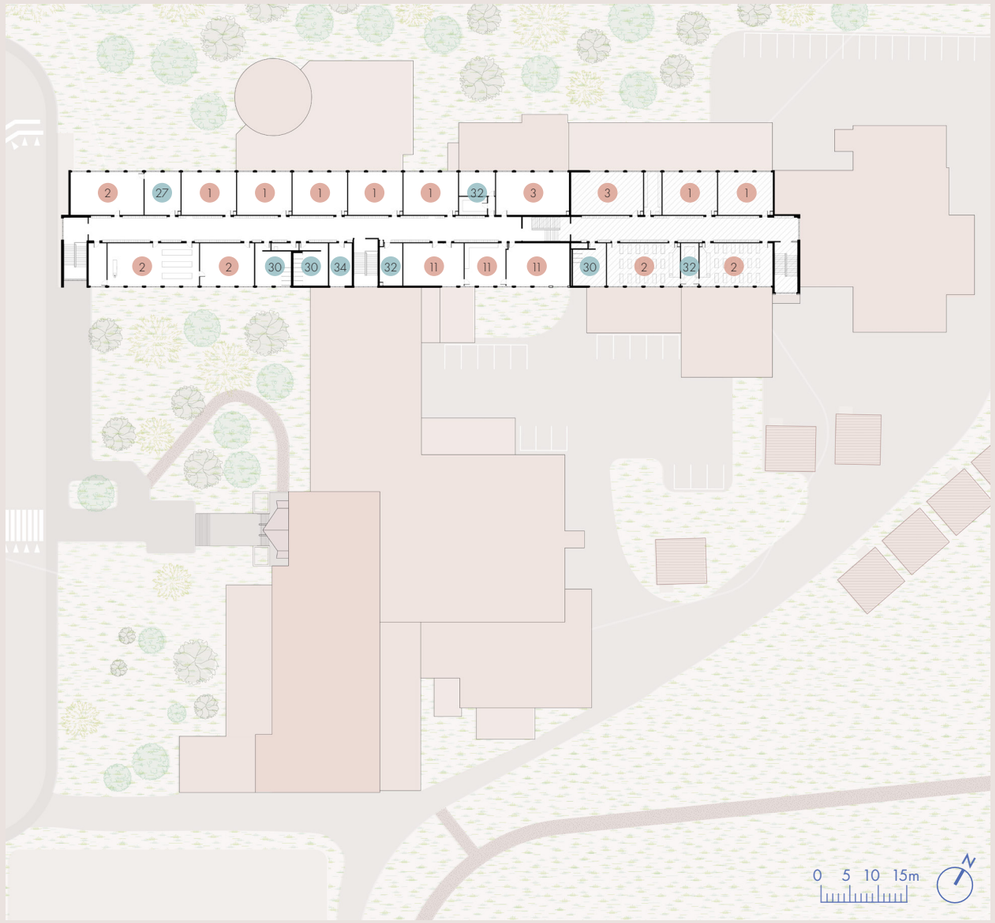


Fig. 4.23 Existing third floor plan

The second and third floors further demonstrate the school's modular design, with identical classrooms arranged along central corridor rows. These levels are primarily occupied by classrooms, science labs, and operational spaces, with corridors functioning mainly as wide, utilitarian circulation paths. The only washrooms available are traditional, gendered facilities, which are increasingly recognized as insufficient for contemporary school environments that call for more inclusive options.

AREA REQUIREMENTS

Since the school was built in 1959, program area requirements have evolved, yet meeting these standards remains essential to ensure each school has the space it needs. The "Building Our Schools, Building Our Future" (2010) report outlines recommended area types and sizes, as shown in the diagram.[10] These recommendations are compared to the school's existing program areas to identify where spaces fall below or exceed the guidelines. Following this, the required areas for the projected enrolment of 1,400 students are established, forming the targets for the redesign.

While this thesis argues that more of these spaces should become flexible—potentially by adopting a more open definition of a 'classroom,' supported by a range of room sizes or social spaces such as multipurpose atriums—the overall program requirements still serve as an important baseline. They ensure that the school community receives an appropriate amount of space. A well-designed school, however, goes beyond these standards, experimenting with adaptable program layouts and incorporating community-oriented spaces.

10 Building Our Schools, Building Our Future: A Report from the Expert Panel on Capital Standards (Expert Panel on Capital Standards, 2010).

AREA TYPE	AREA SUGGESTIONS	EXISTING AREA	REQUIRED AREA	NOTES:
	From the "Building Our Schools, Building Our Future" 2010 report	● under ● over	For a 1,400 student enrolment	
CLASSROOMS & WORKSHOPS				
Classroom	70m² per classroom; total classrooms needed = (enrolment x 7.5 / 21) - 8	● 1,976m² Existing area is way under the required. portable classrooms are being used as a solution	4,375m² (63 classrooms x 70m²)	...but this does not have to be 63 of the same size classrooms. Classroom areas would benefit from varying small to large.
Science Lab & Prep Room	116m² per classroom	● 895m²	1,160m² (10 classrooms x 116m²)	
Business & Computer Lab	97m² per room	● 384m²	291m² (3 rooms x 97m²)	
Music Room	130m² per room	● 314m²	260m² (2 rooms x 130m²)	
Visual Arts & Performing Arts	104m² per room	660m²	624m² (6 rooms x 104m²)	
Technology Lab Large	232m² per room	● 867m²	696m² (3 rooms x 232m²)	
Technology Lab Small	140m² per room	● 367m²	420m² (3 rooms x 140m²)	
Family Studies	114m² per room	● 65m²	114m² (1 room x 114m²)	
Special Education	0.18m² per student	● 120m²	252m²	Resource and extra-help areas are limited when confined to a single location. Integrating these supports directly into classrooms as well would be highly beneficial.
Resource Area	0.18m² per student	● 66m²	252m²	
Meeting Room	27m²	● 77m²	27m²	
ATHLETICS				
Gymnasium & Exercise Rooms	1.11m² per student	● 1,420m²	1,554m²	
Change Rooms	64m² per change room	252m²	256m² (4 rooms x 64m²)	The types of change room spaces need to be carefully considered to ensure they are safe and that everyone feels comfortable using them.
COMMON SPACES				
Foyer	---	160m²	---	
Library Resource Centre	0.37m² per student	531m²	518m²	
Cafeteria	0.46m² per student	● 603m²	644m²	Cafeterias are becoming less relevant, as many students choose to eat elsewhere. In their place, multipurpose spaces are emerging as flexible social environments that can accommodate eating, gathering, or even large lectures.
Auditorium	140m²	● 170m²	140m²	
OPERATIONAL AREAS				
General Office	0.21m² per student	● 260m²	294m²	
Guidance Areas	0.12m² per student	164m²	168m²	
Staff & Teacher Work Room	0.33m² per student	● 560m²	462m²	Staff offices could be integrated into classroom zones as shared 'prep rooms,' allowing teachers to prepare materials while staying connected to students.
Cooperative Education Office	26m²	28m²	26m²	
Kitchen & Servery	0.10m² per student	● 95m²	140m²	
Washrooms	0.30m² per student	● 490m²	420m²	Like the change rooms, the types of washrooms need to be carefully considered for comfort and safety.
Custodial Area	0.16m² per student	● 126m²	224m²	
Academic Storage	0.09m² per student	● 395m²	126m²	
Gymnasium Storage	74.32m²	● 160m²	74m²	
Mechanical Spaces	0.54m² per student	● 583m²	756m²	

Areas that are over requirements offer flexibility for other programs, while areas that are under may need to borrow space from elsewhere

INTERIOR CONDITIONS

The entrance is in good condition, decorated with stained glass windows and marble floor tiles.

The lack of signage makes the building difficult for visitors to navigate.

The current entrance is purely functional, serving only as a circulation space. Its relatively small size makes it restrictive, leaving no room for seating or other welcoming features.

The trophies and plaques at the entrance reveal a rich history of generations achieving great things throughout their high school journeys. These awards highlight individual talents and help foster a sense of mattering within a large school community.



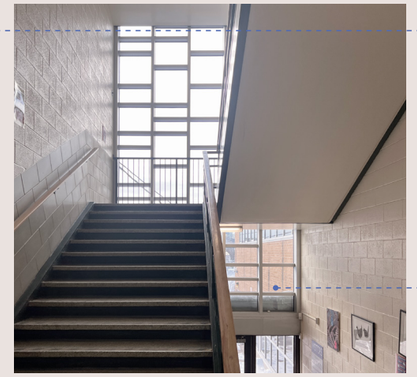
Fig. 4.24 Main entrance foyer



The theatre space was recently renovated and is in excellent condition, requiring no changes. It has a seating capacity of approximately 430 people.

What if the theatre was an accessible space for the community to rent outside of school hours?





The library is a bright, well-maintained space. Extending access to the community outside of school hours would be beneficial, and providing direct access to the exterior would further increase its usability.

The stairwell windows brings a lot of natural light into the corridors.

Fig. 4.25 Top: theatre space. Bottom left: library seating. Bottom right: stairwell

The competition gym is well maintained and the exposed ceiling structure is interesting to see. The space does feel quite dark though.

Why does the window need to be covered? Is there too much glare from the daylight?



A spacious area for student workouts, though its location (extending off the cafeteria) is unusual.

Gym can be divided if needed

The bleachers are old and look uncomfortable. They are primarily used only during major games.





Fig. 4.26 Top: competition gym. Bottom left: competition gym bleacher seating. Bottom right: aerobics room

The fitness room is bright and expresses strong student identity through murals on the ceiling and walls. While some finishes and flooring may need refreshing, the gym equipment is in good condition and the room is generously sized. Introducing views from the corridor could enhance visual connection and create a greater sense of openness.

Why were these windows covered? Does the space get too hot from the daylight?

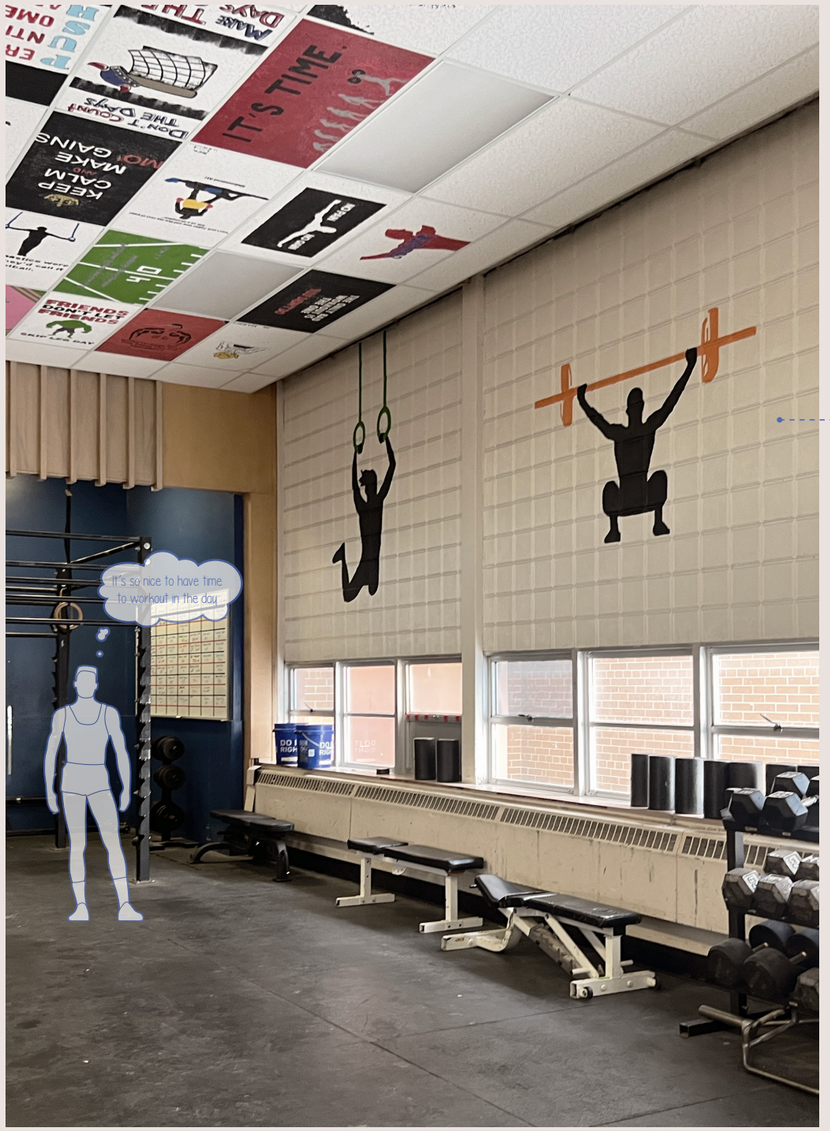


Fig. 4.27 Fitness room

The lower-level corridors are particularly dark and feel like an isolated zone of workshops.

As education becomes more digital with less textbooks and paper, students may no longer need lockers this big.

In my high school, we were assigned small lockers for grade 9 & 10, but did not have lockers in grade 11 or 12. This system worked well, as I found that I rarely used my locker.

The existing floor finishes seem to be very durable.

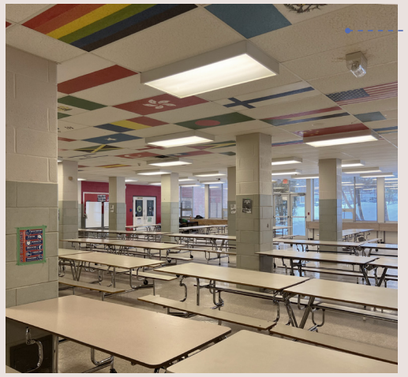


Fig. 4.28 Lower floor corridor

The corridors are confusing to navigate through... they all look the same.

With no seating, social areas, or views into classrooms, the corridors function purely as a circulation space...
But, given their generous size, could they be reimagined as lively social & learning spaces?







Cafeteria use is minimal, with most students choosing to eat on the corridor floors, in classrooms, outside or even in their cars. Could this space be used as something else?

Steel columns are fire-protected with CMU.

Extra cafeteria space has been converted into a workout area.

Fig. 4.29 Top: third floor corridor. Bottom left: cafeteria. Bottom right: workout space in cafeteria

Most classrooms have a similar layout and atmosphere, which limits the potential for diverse learning experiences.

The large windows provide plenty of daylight. However, in the warm weather they let in too much heat. Without cooling, this makes the classrooms very uncomfortable.



The blinds provide a useful option for students and teachers to control light in the space.

Many of the desks appear to be in good condition and are flexible enough to support different classroom layouts.





Fig. 4.30 Top: classroom with single desks. Bottom left: classroom with group desks. Bottom right: classroom with clustered desks

The workshop spaces are in good condition and function well for their dedicated programs. They are quite dark, however, and could be more engaging if students could view them from the corridors.



The workshop spaces are quite clustered. Additional storage would help improve organization.



The music room includes individual practice rooms, which provide a very useful space for students.

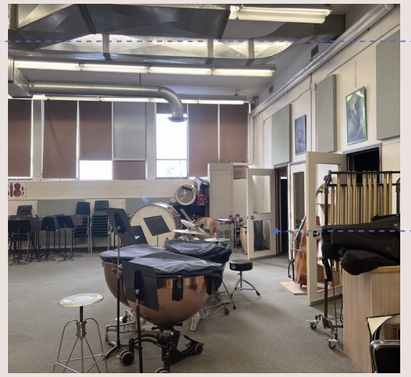


Fig. 4.31 Top: transportation technology workshop. Bottom left: art workshop. Bottom right: music room

SERVICE CONDITIONS

Exposed steel column

The staff room is a cramped space, providing teachers with little privacy from one another.



ACT (acoustic ceiling tile) are damaged in several areas and need to be replaced.

Many of the floor tiles have not been replaced and still contain asbestos. Damaged floors in other classrooms have been updated.





Fig. 4.32 Top: staff room. Bottom left: acoustic ceiling tile in classroom. Bottom right: floor tiling with asbestos in classroom



The mechanical equipment appears fairly new and is functioning well. Improved building envelope performance could reduce the number of machines needed and lower energy use.

The mechanical room currently lacks cooling equipment and has no space for it, though it could potentially be installed on the roof.

Fig. 4.33 Mechanical room

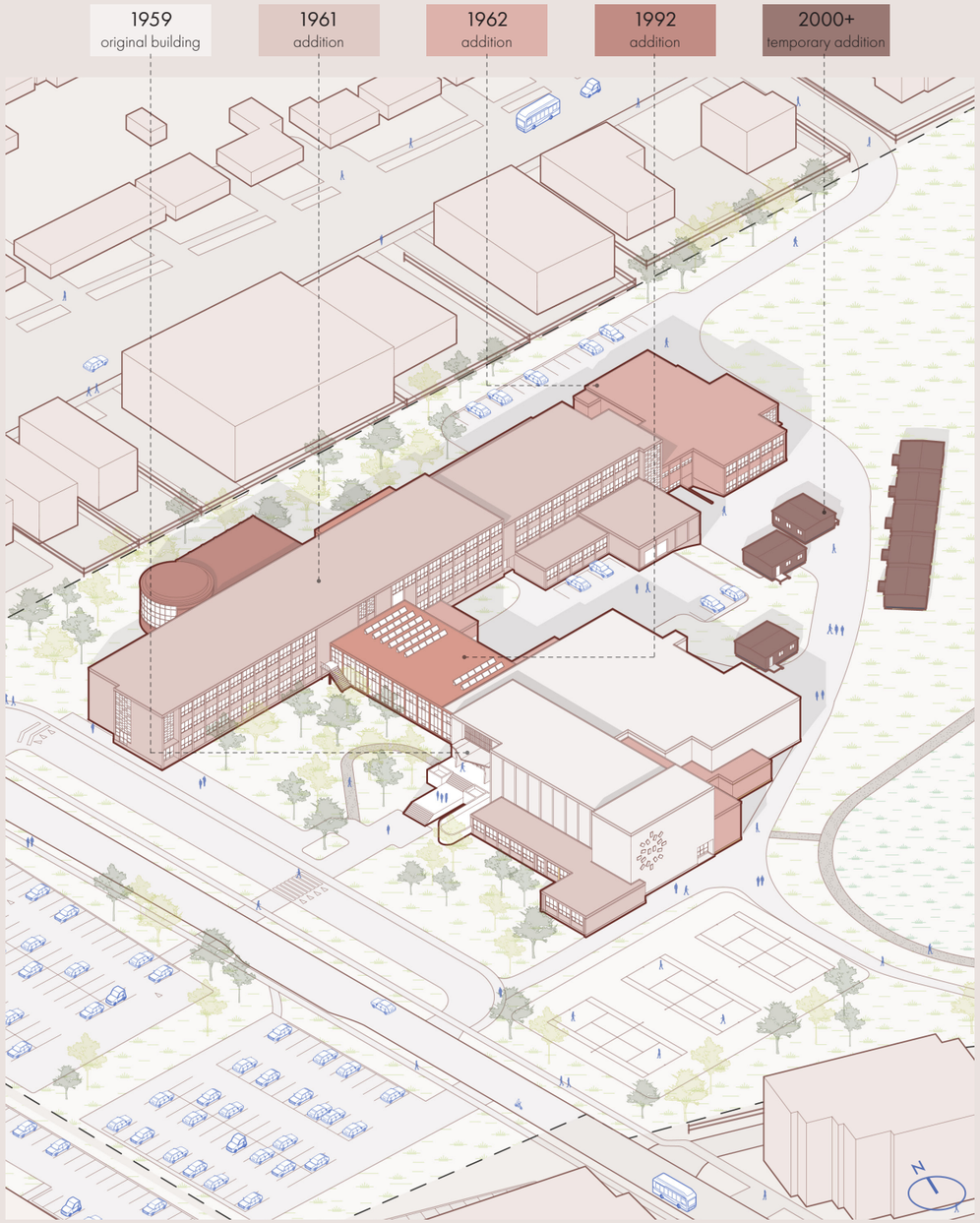


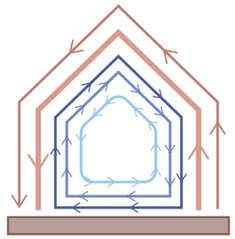
Fig. 4.34 Diagram of existing building additions and development over the last 75 years

Since the construction of WCI in 1959, the school building has seen additions, adaptations, and changes. Many of the changes occurred within the first three decades of the building's life, led by the original architects, Barnett & Rieder, who had planned potential expansion zones on site even before construction began. These additions were strategically implemented as the local population and student enrollment grew. In 1993, a particularly notable addition was made: a bright and spacious library designed as a large learning environment for independent studies.

Over the last thirty years, the building has seen no major transformations. As shown in the photographs, most interventions have been piecemeal: caulking has been layered onto the structure, north-facing windows have been covered to minimize heat loss, the roof has been replaced as needed, the auditorium has been renovated, the fitness room has been repainted, and classroom floor tiles containing asbestos have been removed. To accommodate ongoing enrollment pressures, approximately eleven portable classrooms have been added to the site as well.

These updates have been largely fragmentary, carried out only as funding becomes available. Like many schools in Ontario, WCI has been maintained through short-term fixes aimed at keeping it functional until sufficient funds are allocated for a complete rebuild. This thesis argues that, with careful design, the existing building can once again exemplify quality education through adaptive reuse, rather than succumbing to demolition.

Given the building's overcapacity and significant accessibility challenges, the recommended approach is a comprehensive addition and adaptive reuse project. Moving forward, the school must be treated as a whole, with its physical form, educational purpose, and community role considered together. True transformation cannot occur through fragmented maintenance; it requires a holistic, coordinated redesign that reimagines the existing structure.



STUFF	5-15 years
SPACE PLAN	5-20 years
SERVICES	5-30 years
SKIN	30-60 years
STRUCTURE	60-200 years
SITE	permanent

Fig. 4.35 Diagram of Frank Duffy's "shearing layers of change" concept

4.3 Redesigning the School (Schematically)

As a holistic approach to reimagining WCI, this section offers a schematic redesign of the existing building. Although details are limited, the redesign represents an essential step in engaging with the school's actual conditions, demonstrating a methodical process of addition and adaptive reuse through a context-informed design response. The brief redesign provides the framework for the detailed drawings that follow, which outline in-depth design decisions for adapting the school at the classroom, building, and community scales.

The redesign process starts with a demolition drawing. As shown, the central wing of the building is proposed for complete removal. This area currently contains two stair transitions between the existing half-levels, making accessible circulation difficult. At the same time, this section of the building primarily houses administrative functions and features extensive glazing through a curtain wall system. Given its limited programmatic use and inefficient envelope, this area offers an opportunity to be reimagined as a connective element; a space that bridges the split levels into a unified, accessible floor plane and forms the foundation for a more cohesive and inclusive school layout.

Throughout the rest of the building, most interior walls, lockers, and equipment are proposed for demolition. Certain areas that are relatively new and in good condition, such as the auditorium, are to be retained based on the existing building assessment. Since interior elements ("stuff") typically have a lifespan of 5–15 years, and spatial layouts about 5–20 years, these components of a 66-year-old building are well beyond their intended lifecycle and need updating, therefore demolition is justifiable. What is most important to retain is the structure and envelope, including the foundation, steel framing, exterior walls, windows, and roof. The structural system appears to be in good condition, and its materials, such as steel framing and concrete floor slabs, contain significant embodied carbon. Preserving these components not only conserves this embedded energy but also reduces substantial financial and environmental costs. The true value of the building lies within these durable systems; interior finishes and partitions can, and should, be replaced periodically. The structure itself could potentially have another century of service.

Improvements to the building envelope are necessary to enhance energy efficiency and comfort. Since existing walls lack insulation and the original windows perform poorly, a layer of exterior insulation, weatherproofing membranes, and new cladding could be added to improve thermal performance. Replacing the windows and roof assemblies would also ensure a more efficient and sustainable building. The technical details of these upgrades are beyond this thesis's scope, though potential areas for such improvements are highlighted in red annotations throughout the following drawings.

Embodied carbon = emissions generated by the construction & disposal of a building (raw materials, transportation etc.)

Operational carbon = emissions from day-to-day use of a building (heating, cooling, lighting etc.)

Buildings account for over 40% of global carbon emissions. With approximately 1,781 schools in Ontario needing upgrades, demolishing and rebuilding these structures is neither sustainable or fiscally responsible. Instead, school boards have an opportunity to lead by example, demonstrating how holistic reuse and adaptive design can significantly reduce carbon emissions.[15]

[15] "The Built Environment Is the Single Largest Contributor of CO_2 Emissions. What Can Be Done about It?," World Economic Forum, accessed October 20, 2025, https://www.weforum.org/videos/31521-over-the-last-100-years/.

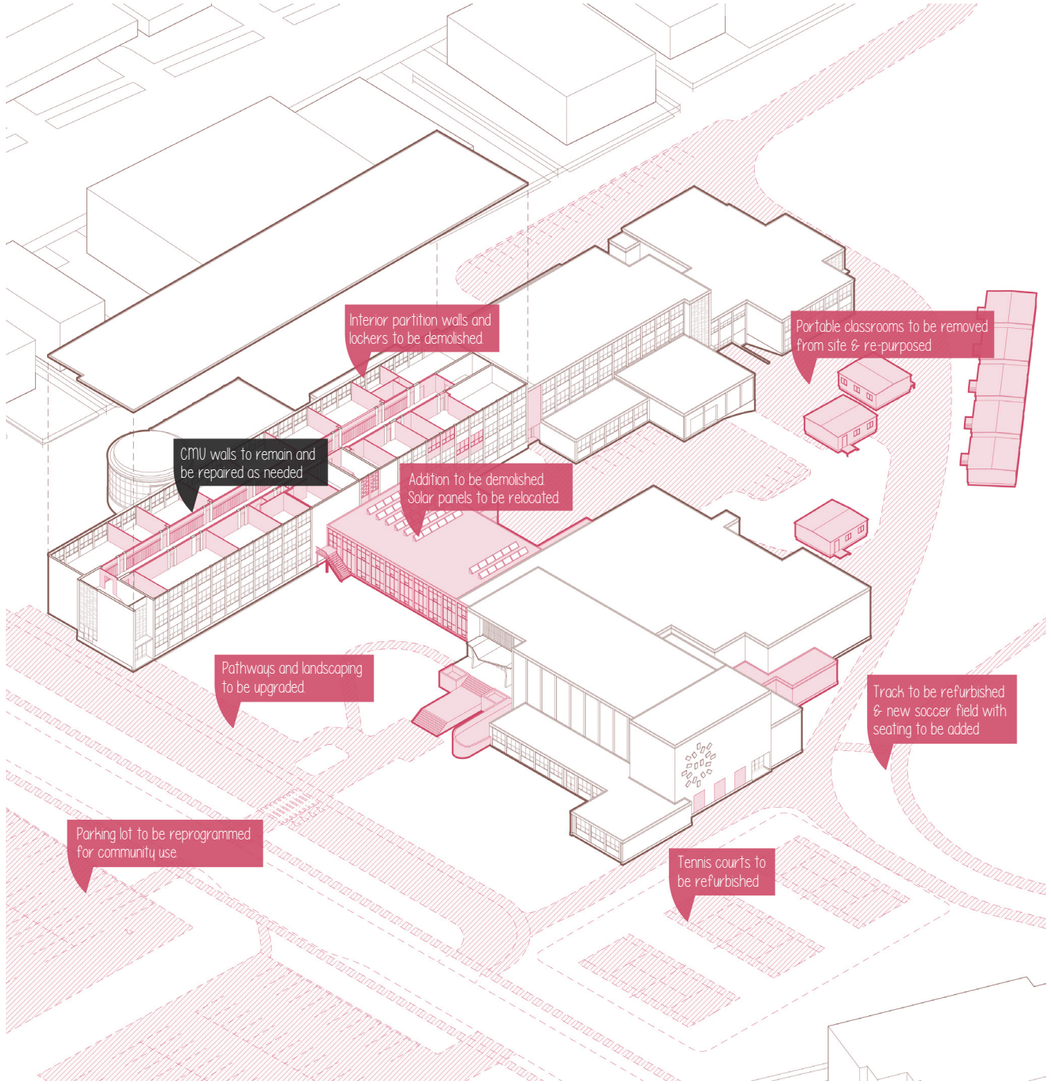


Fig. 4.36 Demolition diagram of WCI

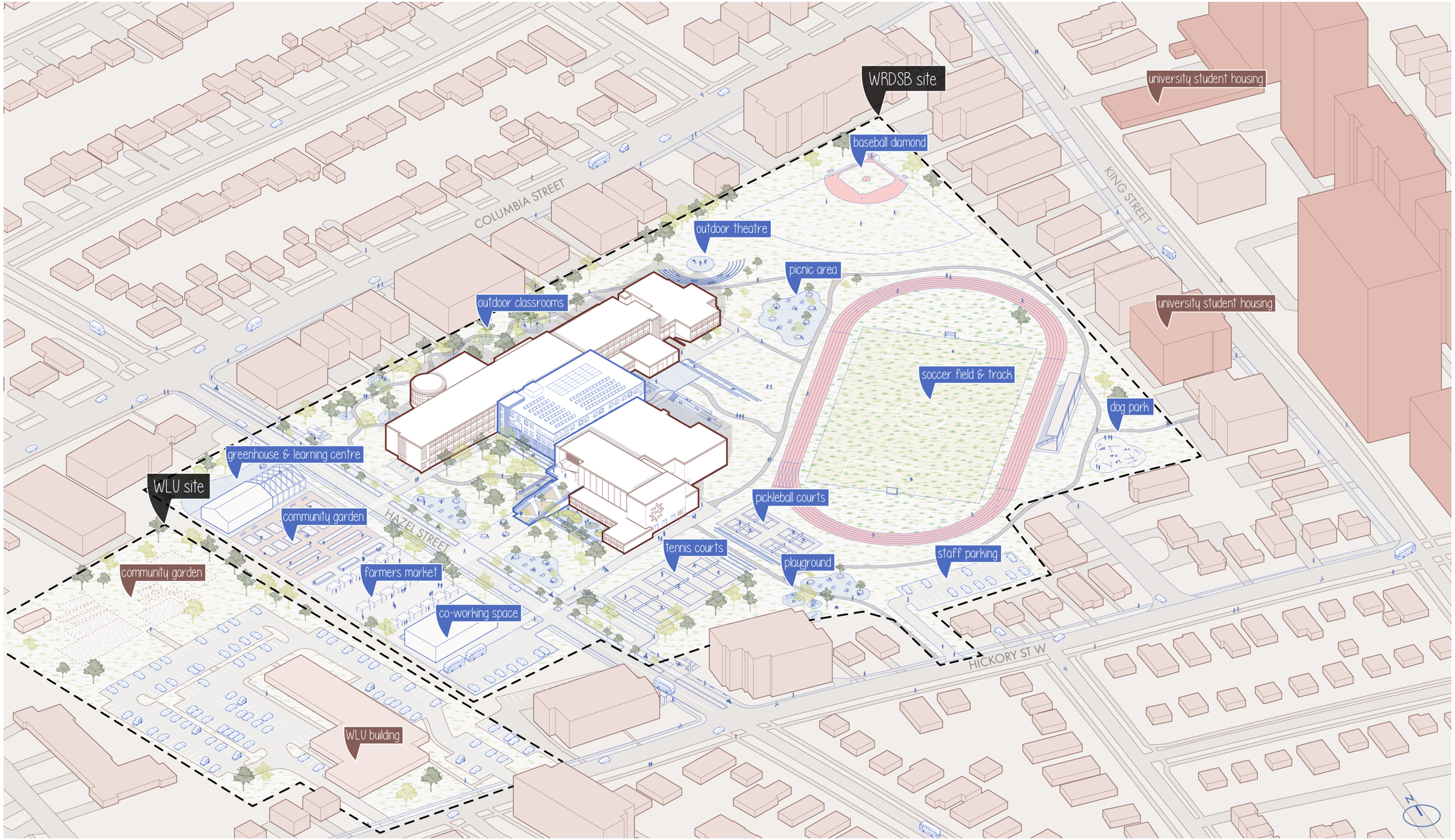


Fig. 4.37 Proposed site axonometric

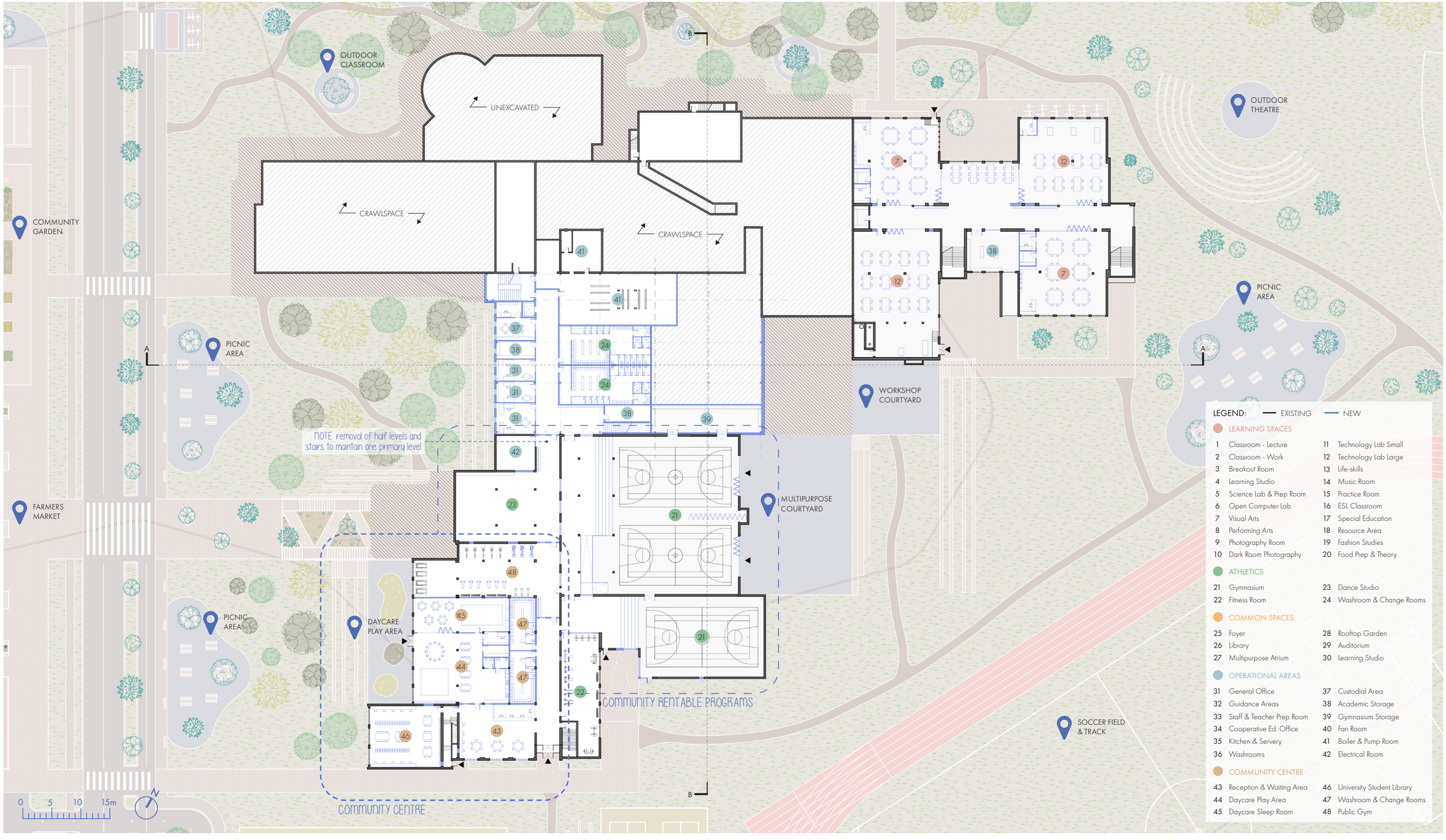


Fig. 4.38 Proposed lower floor plan

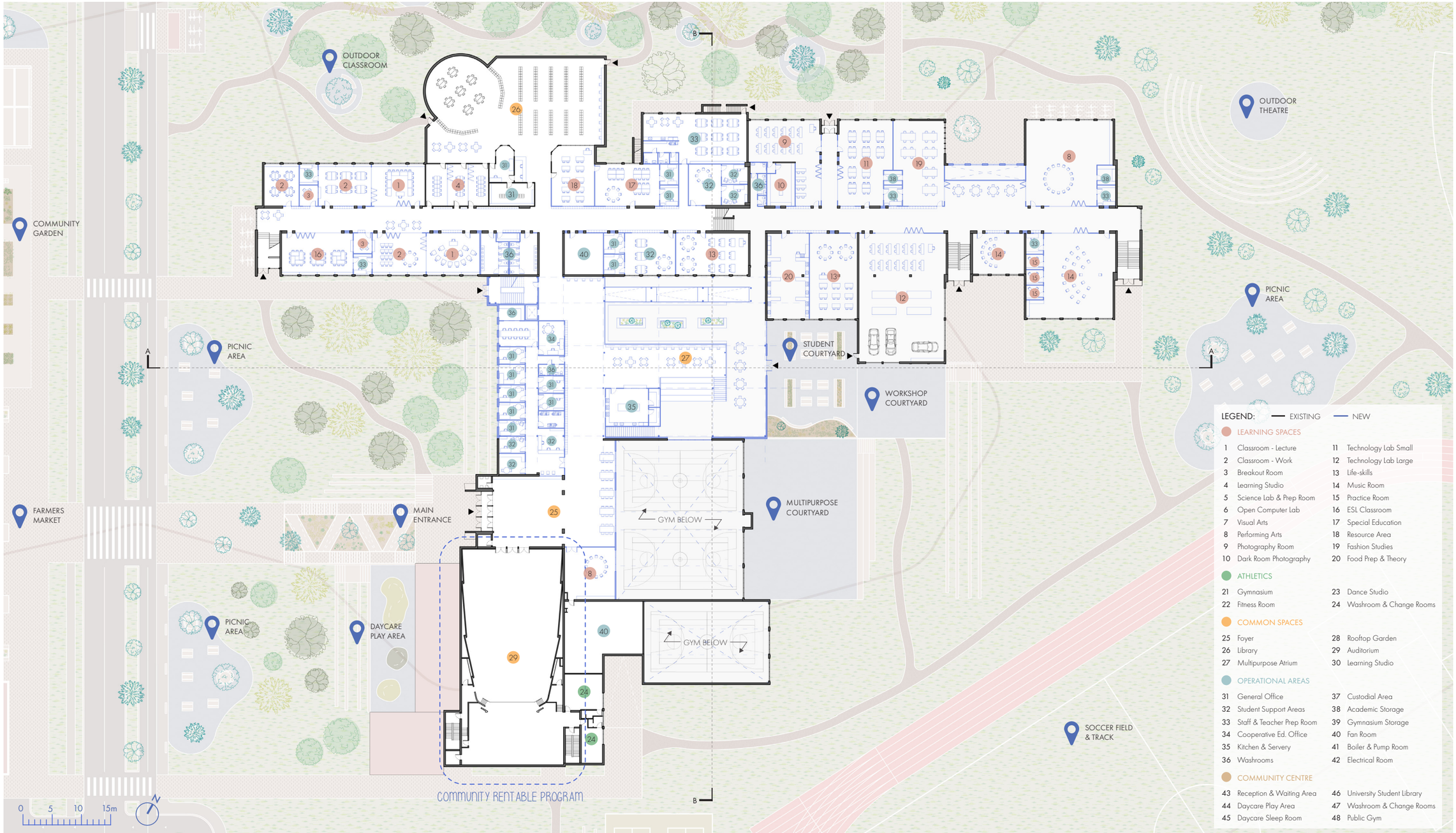


Fig. 4.39 Proposed ground floor plan

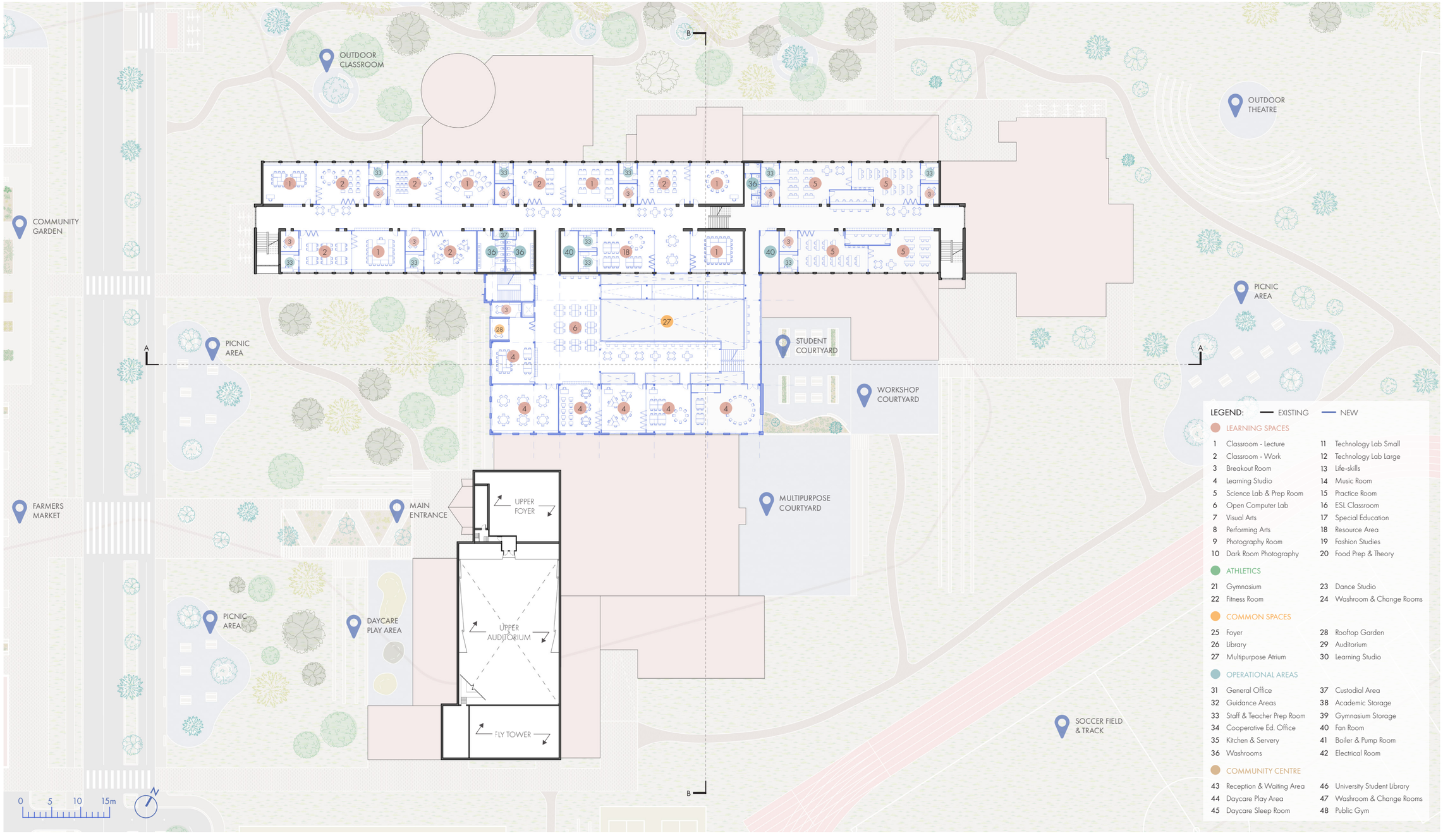


Fig. 4.40 Proposed second floor plan

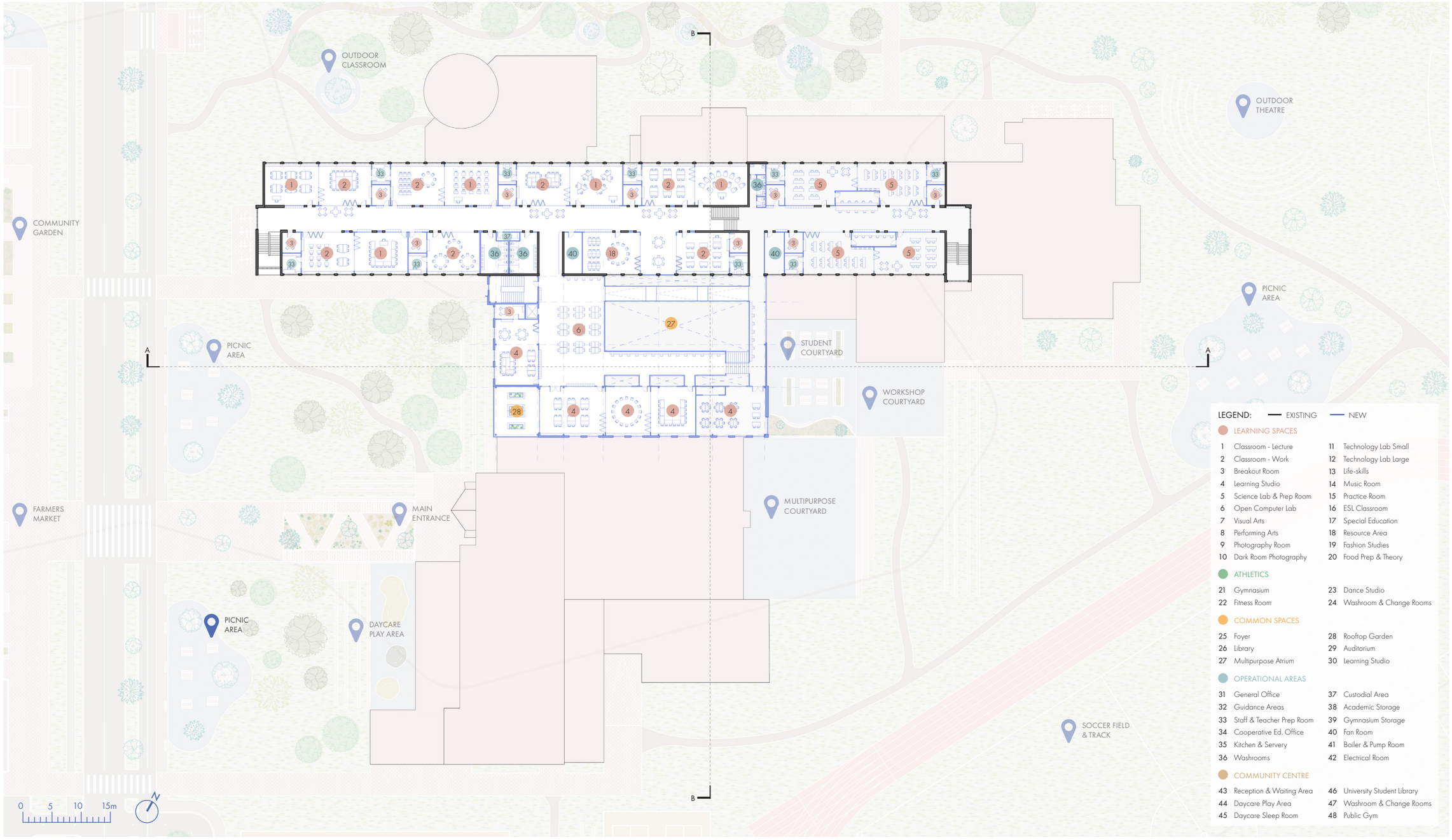


Fig. 4.41 Proposed third floor plan

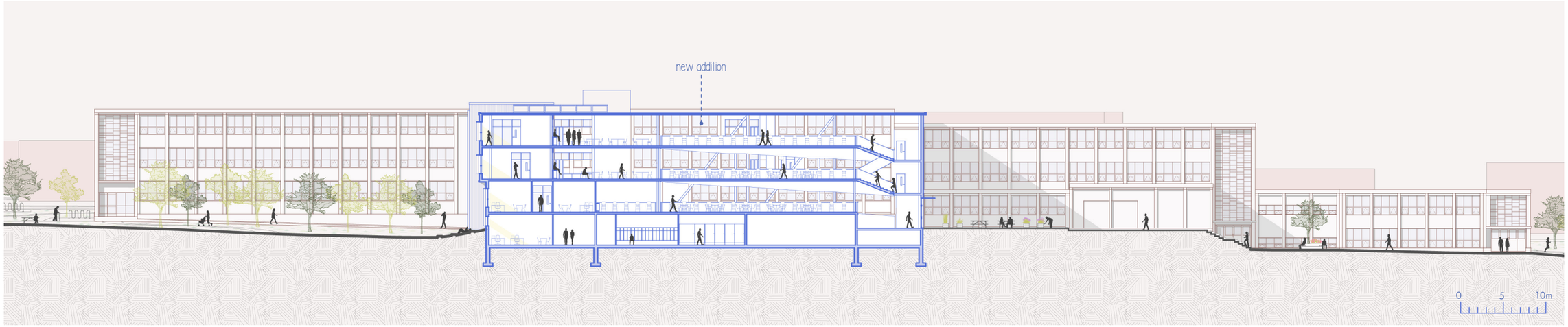


Fig. 4.42 Proposed section AA

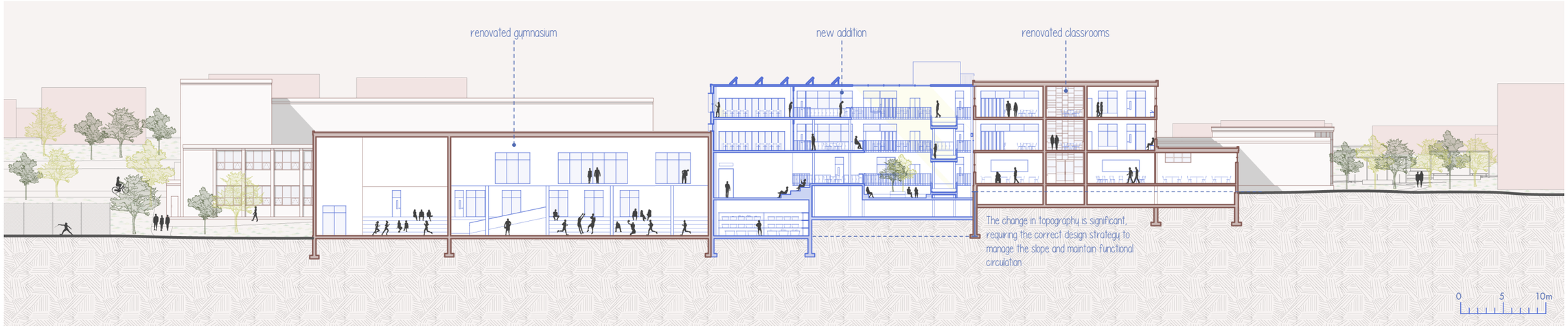
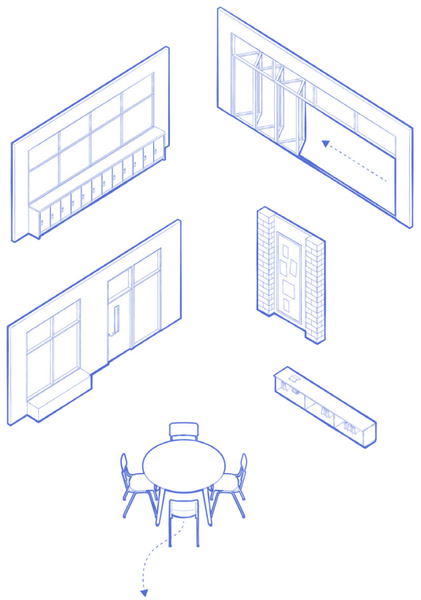


Fig. 4.43 Proposed section BB

4.4 Designing for Students Success - the classroom scale

Classrooms, niches, and corridors serve as students' home bases. When designed and operated thoughtfully, these spaces can become safe environments where students can retreat, develop skills, and connect with others. In such close-knit settings, it is essential that every student feels safe, included, and empowered to engage in learning, personal growth, and a sense of mattering. Pedagogical strategies, contextual assessments, and design must accommodate diverse learning styles, ensuring that each student is supported through methods best suited to their individual needs. Features such as transparent, glazed classroom walls foster curiosity and visual connection, while movable partitions enhance flexibility, allowing spaces to adapt to different learning activities. This study focuses on redesigning three small-scale areas of the school: classrooms, learning studios, and corridors.



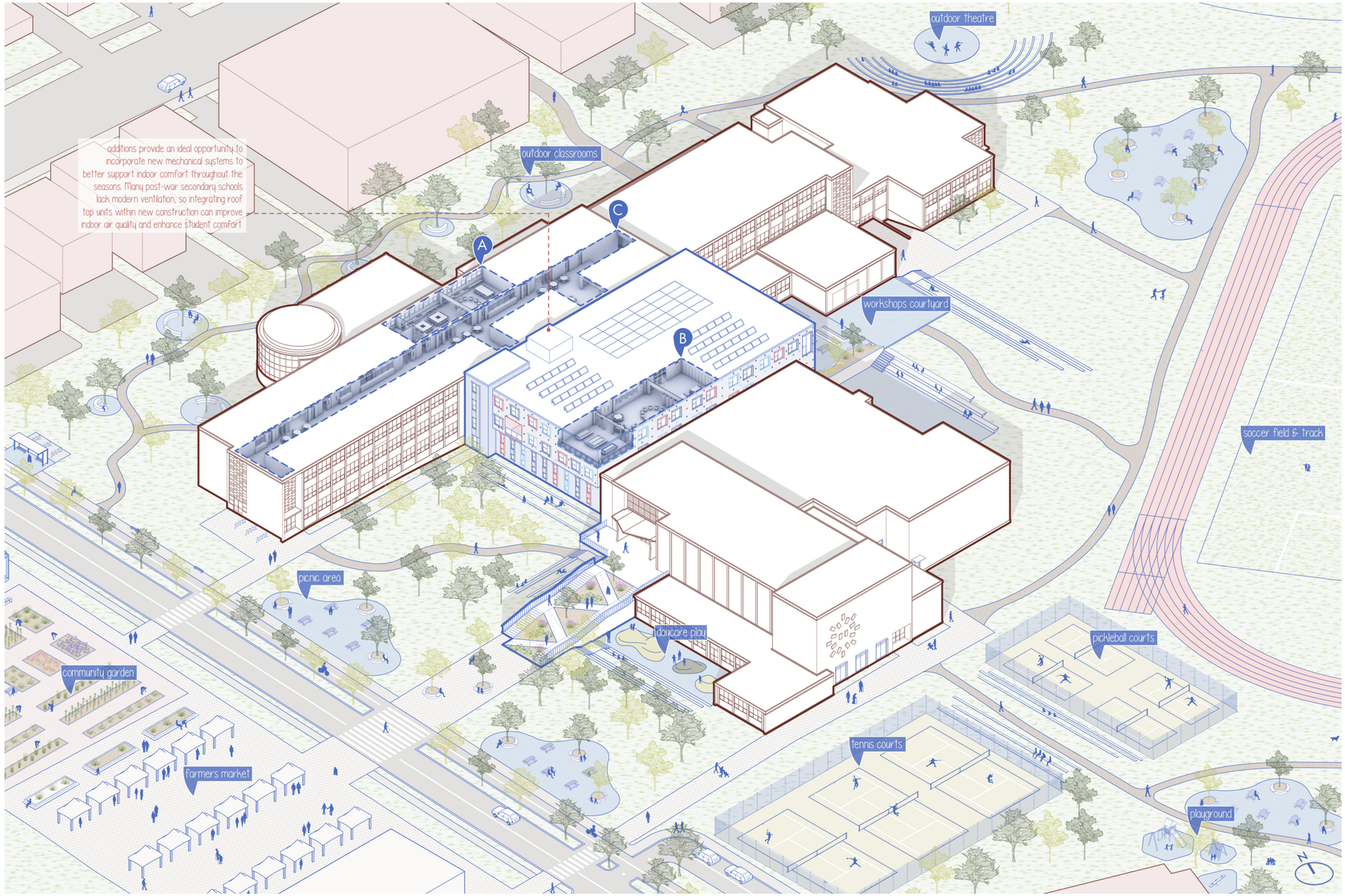
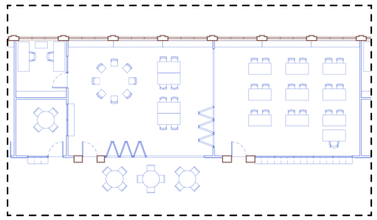


Fig. 4.44 Proposed site axonometric highlighting areas of focus for the classroom scale redesign

A CLASSROOMS - existing building wing



WHAT IS A CLASSROOM?

A school does not need a single 'standard classroom.' Instead, schools could benefit from including multiple classroom types, each capable of supporting different modes of learning, much like a learning suite. Since learning occurs in diverse ways and settings, it is important to provide areas that allow students to explore and experiment with various learning styles. By varying in scale, classrooms can better inspire curiosity and prioritize student needs, while still accommodating essential teaching structures and curriculum requirements. Incorporating elements such as sliding or movable walls can enable the expansion or contraction of spaces, allowing classrooms to adapt to different activities, group sizes, and pedagogical approaches. Working within an existing building with modular column grid spacing does not prevent variation in classroom size, though it may limit the total number of configurations possible.

1. Work with the existing structure grid
2. Integrate "extra-help" areas in learning studios
3. Use windows to connect to corridors & exterior
4. Make rooms expandable & dividable
5. Attention to flexibility, storage, materials
6. Extend the classroom into the corridors

Note: Numbers refer back to the design principles outlined in Section 4.1 and indicate how each of those principles is applied within this context.

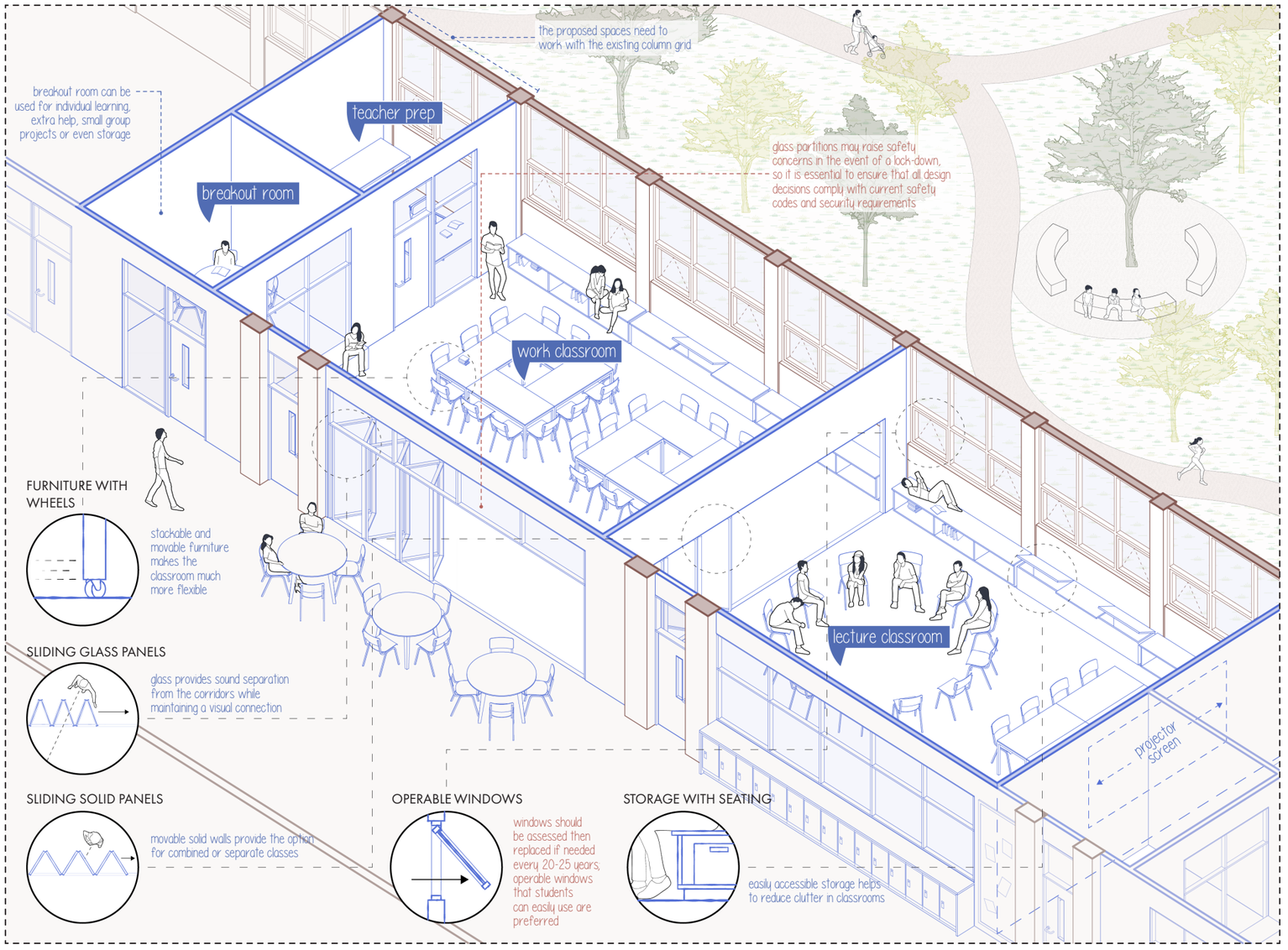


Fig. 4.45 Proposed classroom design



Fig. 4.46 Small breakout room, Common Ground High School, CT

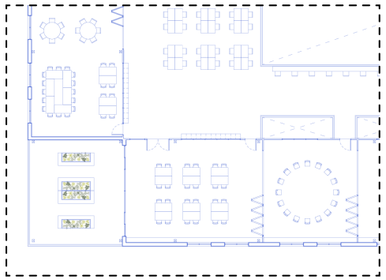


Fig. 4.47 Transparency into the classroom, École Salish Secondary School, BC



Fig. 4.48 Windows with seating and storage, St. Mildred's-Lightbourn School, ON

B LEARNING STUDIOS - addition wing



WHAT IS A LEARNING STUDIO?

The term *learning studio* is used instead of *classroom* to describe the spaces within the addition. Varying in size, flexibility, and connection to the atrium, these studios are designed to support student-led learning and can also serve the community after hours for tutoring or adult classes. The student-led concept does not mean the absence of a teacher; rather, it allows groups of students to find spaces to work independently on projects, while teachers circulate to facilitate and support as needed. The term "studio" reflects the purpose of these spaces: to encourage students to explore and develop their individual ways of learning. Each learning studio is unique in form and spatial connection, intentionally extending into adjacent areas to foster interaction, flexibility, and collaboration.

1. Place addition where best integrates with existing
2. Consider different needs of classroom users
3. Strategically define what is open and enclosed
4. Make community spaces, not just classrooms
5. Give students agency over space & how its used
6. Create social environments, socialization is part of learning

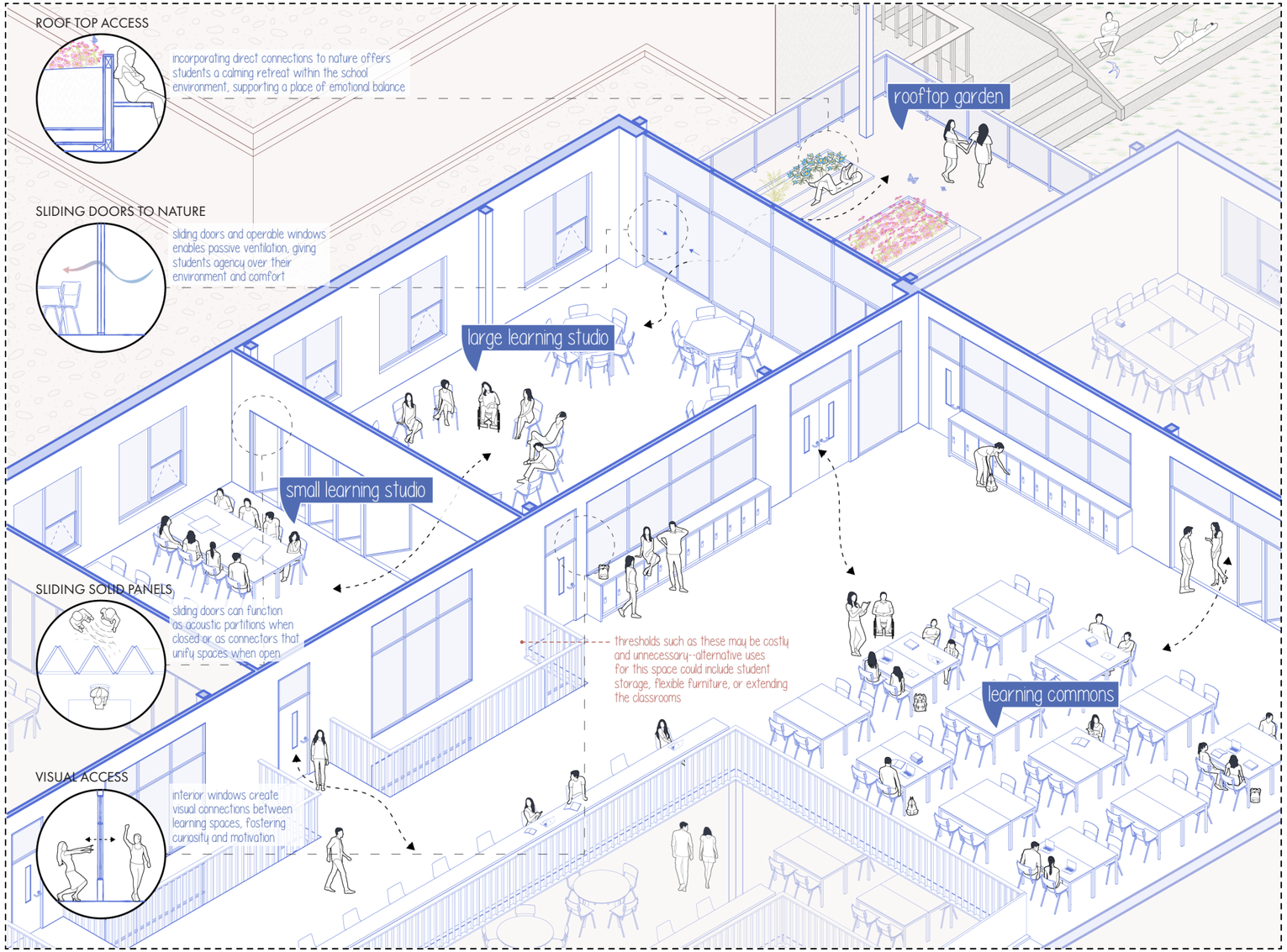


Fig. 4.49 Proposed learning studio design

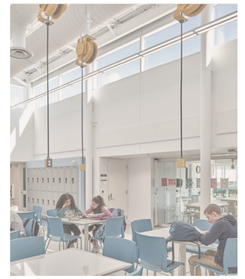


Fig. 4.50 The corridor as a classroom, Marine Drive Academy, NS

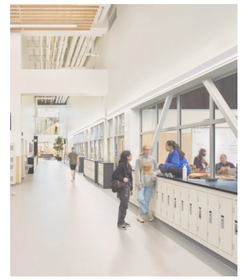


Fig. 4.51 Small lockers as social hubs, Handsworth Secondary School, BC

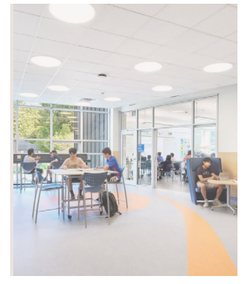


Fig. 4.52 Seating arrangements, Handsworth Secondary School, BC

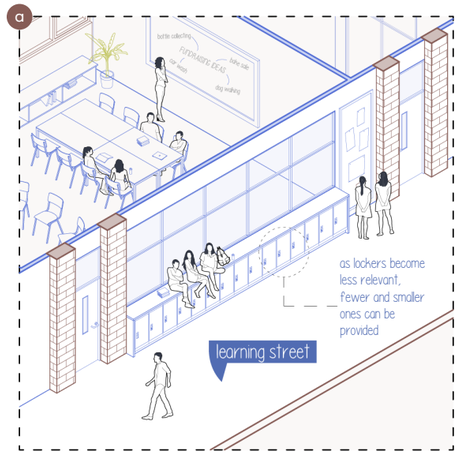


Fig. 4.53 Proposed fragments of the learning street

C LEARNING STREET - existing building wing



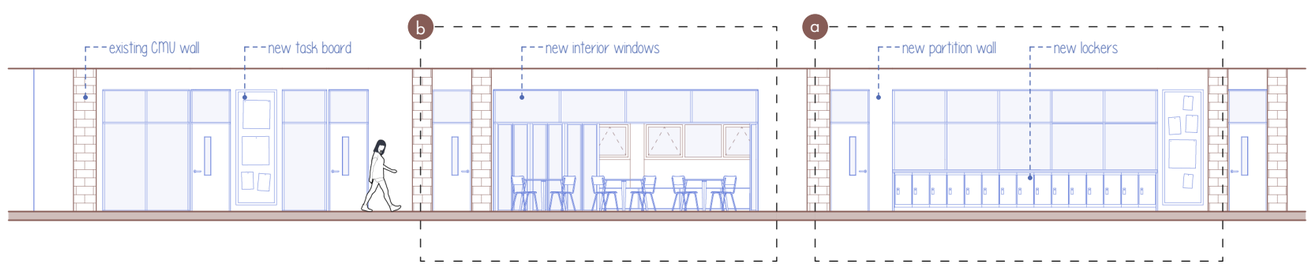


Fig. 4.54 Elevation of proposed learning street

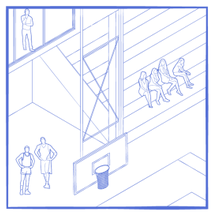
WHAT IS A LEARNING STREET?

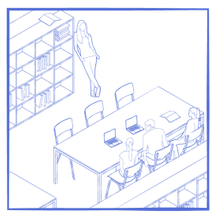
Corridors are typically spaces of circulation, but when designed with niches, transparent walls, seating, connections to classrooms, and appropriate equipment, they can become learning streets. Similar to learning studios, these streets can be student-led, providing spaces where students can engage in ways that suit their individual needs and preferences.

4.5 Designing for School Identity - the building scale

By supporting the developmental needs of adolescents, the school building can function as a safe space where students take risks, explore, and make the most of new opportunities. When treated as a student-centred environment, the school becomes a place rich with learning moments, whether through social interactions, independent work, observation of the exterior environment, or engagement with the surrounding community. These informal experiences help students build a sense of belonging and develop their identities within the school community. Transparency throughout the building not only enhances safety but also sparks curiosity, encouraging students to explore different classes, workshops, and clubs. This study focuses on three key interventions: the addition of a learning commons, the retrofit of the gymnasium, and the adaptation of the building to include a community centre.







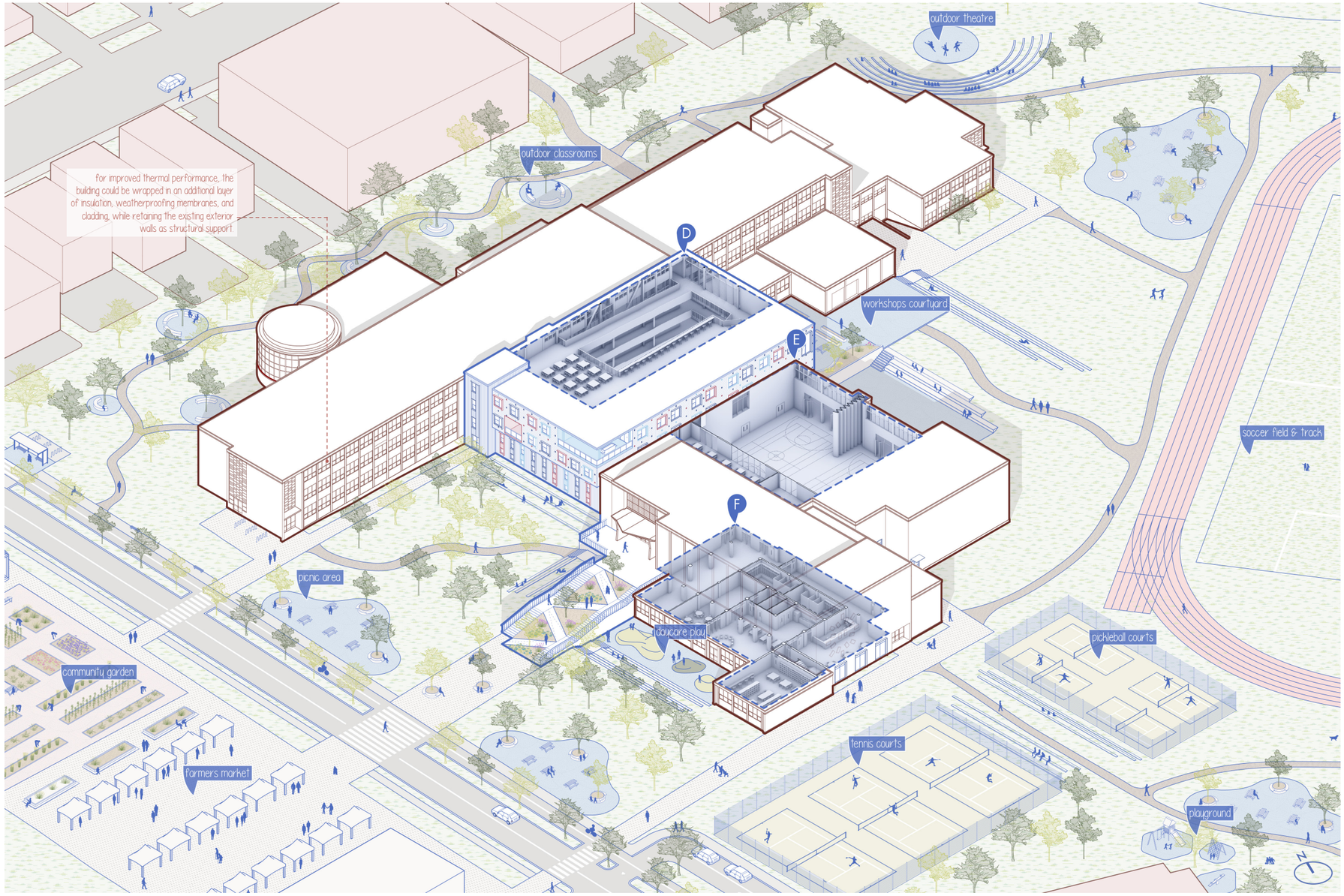
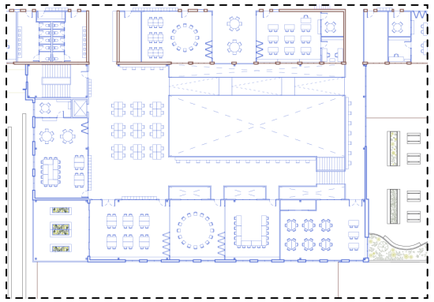


Fig. 4.55 Proposed site axonometric highlighting areas of focus for the building scale redesign

D MULTI-PURPOSE ATRIUM - addition wing



WHAT IS A LEARNING COMMONS?

A learning commons is a flexible and collaborative space, typically positioned at the center of a school to link multiple program areas. Since these spaces are usually open and multi-storey, integrating one within the existing structure would have presented significant challenges. Consequently, the learning commons is introduced as a new addition to the building. Functioning simultaneously as an atrium, it acts as the primary circulatory hub. At its center, a gently sloped ramp provides an accessible route while also creating a dynamic spatial experience as students move between the existing and new structures. Designed as an open and adaptable setting, the learning commons accommodates a broad range of activities, including small study groups, lectures, school-wide gatherings, lunch periods, and informal social interactions. Integrated technology, such as accessible laptops, charging stations, and monitors, supports both individual and collaborative learning, reinforcing the space's role as a central academic resource.

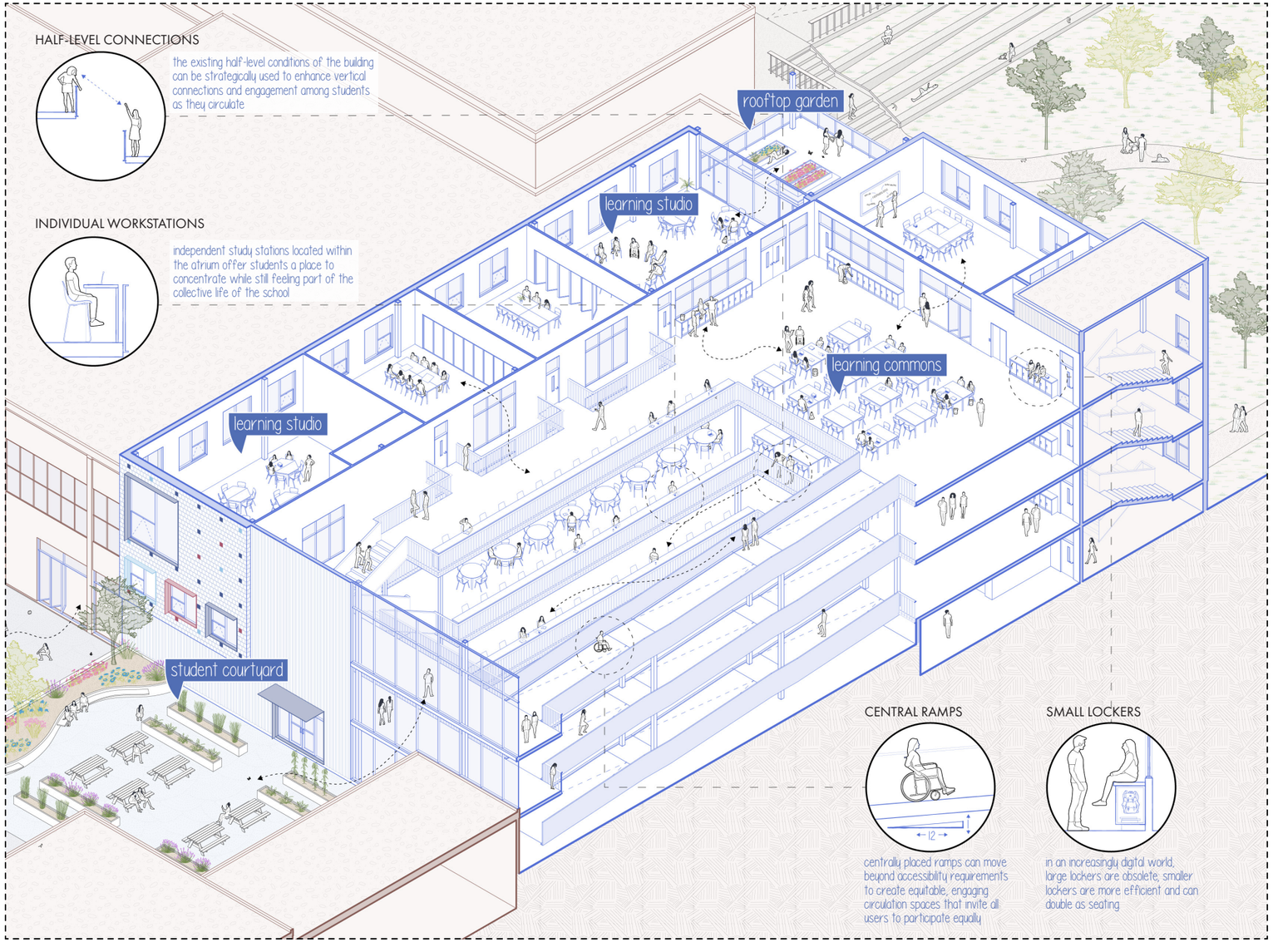


Fig. 4.56 Proposed learning commons design



Fig. 4.57 Atrium main entrance, Handsworth Secondary School, BC

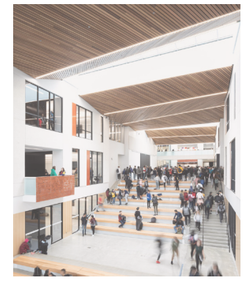


Fig. 4.58 Atrium with balconies, R.E. Mountain Secondary School, BC

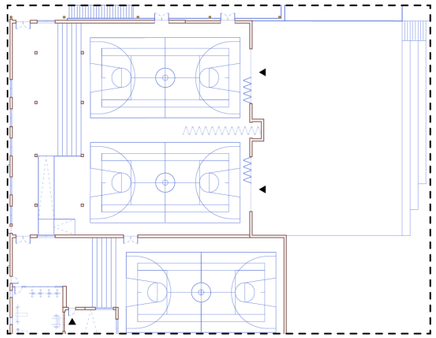


Fig. 4.59 Atrium as a circulation space, Oak Bay High School, BC



Fig. 4.60 Reimagined atrium space

E COMPETITION GYMNASIUM - existing building wing



WHAT IS A GYMNASIUM?

The gymnasium serves as a vital space of school spirit, identity, and community. It is where students, teachers, and staff come together to celebrate achievements, share challenges, and participate in collective events, from athletic competitions to assemblies and seasonal celebrations. Establishing clear visual connections between the gymnasium, main entrances, and atrium spaces enhances its sense of energy and inclusion within the school, while also introducing natural light into a space that is often large and enclosed. Parallel connections to adjacent outdoor areas further enrich physical education by enabling activities to extend beyond the building. When designed with accessibility in mind, the gymnasium can serve as a valuable community asset, providing flexible space for local events, recreational programs, and sports clubs.

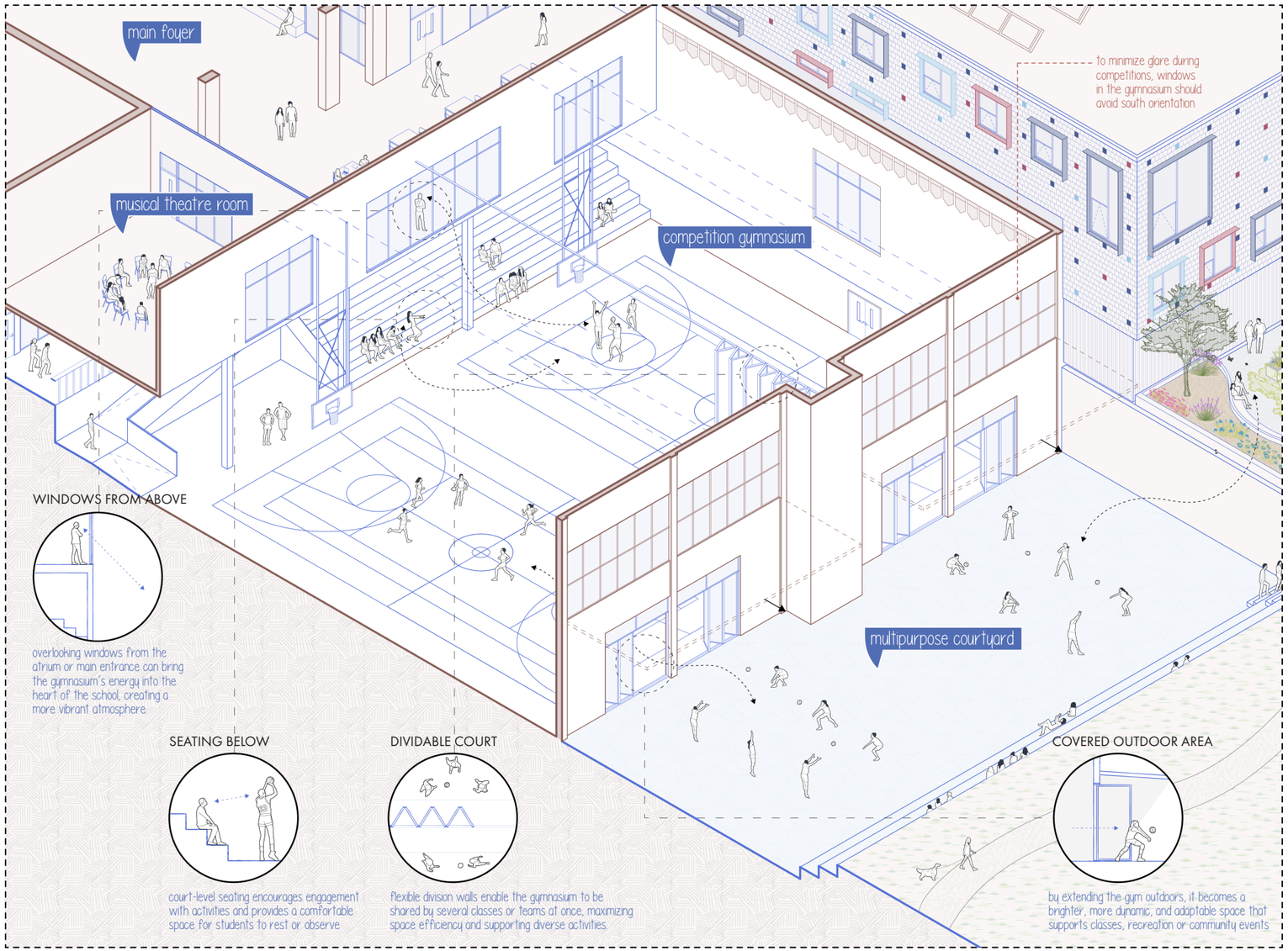


Fig. 4.61 Proposed gymnasium redesign

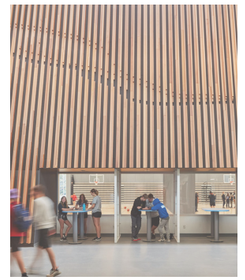


Fig. 4.62 Views into gymnasium, Shas Ti Kelly Road Secondary School, BC



Fig. 4.63 Extending gymnasium to the outside, Common Ground High School, CT

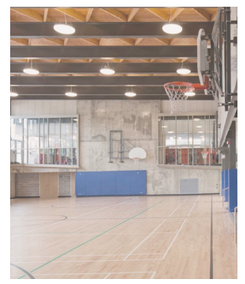
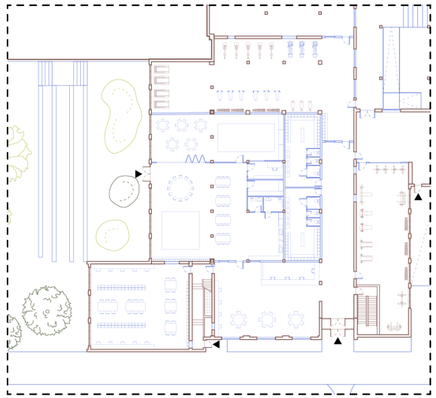


Fig. 4.64 Retrofitted interior windows, Thorncliffe Community Centre, ON



Fig. 4.65 Reimagined gymnasium space

F COMMUNITY LEARNING CENTRE - existing building wing



WHAT IS A COMMUNITY CENTRE?

A community centre can encompass any range of spaces that serve the surrounding neighbourhood, including daycares, libraries, and fitness facilities. When integrated within a school building, the foremost consideration must be the prioritization of student spaces, schedules, and safety. Providing a dedicated entrance for community users, monitored by a reception area, ensures that community access occurs securely and respectfully. Transparency, through strategically placed windows, can foster visual connection and engagement between students and community members, while controlled access points, such as keyed or fobbed doors, maintain necessary boundaries. Although these centres do not need to be extensive in size, they can effectively expand into existing school facilities after hours, such as the auditorium, gymnasium, or learning commons, allowing the school to function as an active community hub well beyond regular school hours.

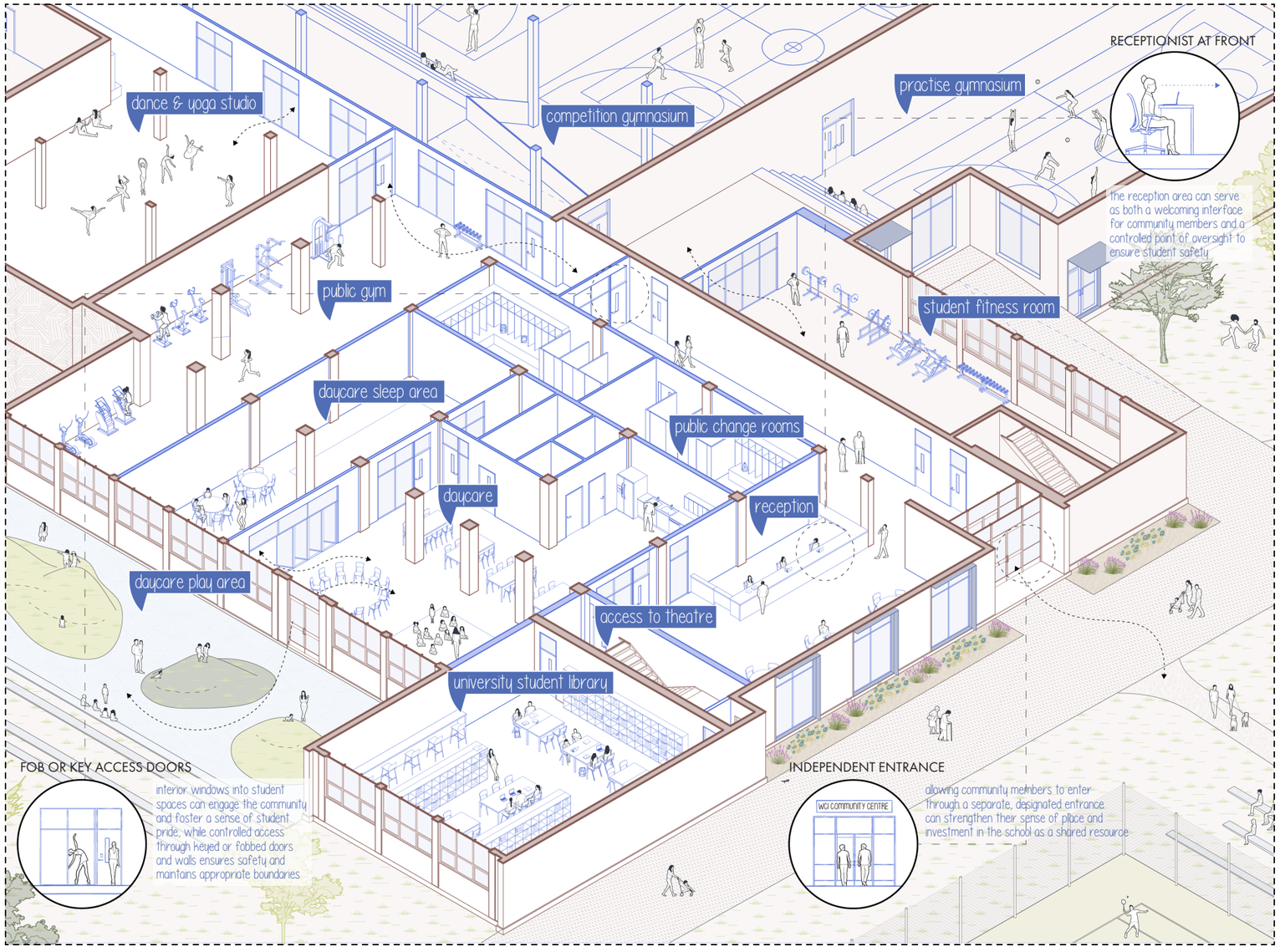


Fig. 4.66 Proposed community centre design



Fig. 4.67 Welcoming community entrance, Common Ground High School



Fig. 4.68 Transparency between programs, R.E. Mountain Secondary School, ON



Fig. 4.69 Daycare with exterior connection, Thorncliffe Community Centre, ON

4.6 Designing for Community Integration - the urban scale

As adolescents prepare for adulthood, exposure to community involvement becomes a vital and formative experience. Although such experiences can be intimidating and involve a degree of risk, it is within the real world that students discover their passions, develop practical skills, and begin to shape their sense of identity. Therefore, it is essential to view the community as an extension of the school—an environment that supports learning beyond the classroom. When students are given responsibility through work experience, mentorship, volunteering, and other forms of engagement, they gain a sense of purpose and connection to something greater than themselves. To support this, partnerships with local programs that are walkable or easily accessible by public transit are crucial. Likewise, teachers and student groups can take an active role by organizing opportunities to learn beyond school grounds.

The school site itself can serve as a bridge between students and the broader community. Through welcoming landscaping, outdoor programming, and thoughtful maintenance, the school can become a place that people are drawn to and take pride in as part of their neighbourhood. When designed as a vibrant, 24/7 space within the urban landscape, the school can support both learning and community life. In these shared environments, students form meaningful connections with others, while the community, in turn, becomes a valuable resource for educational experiences.

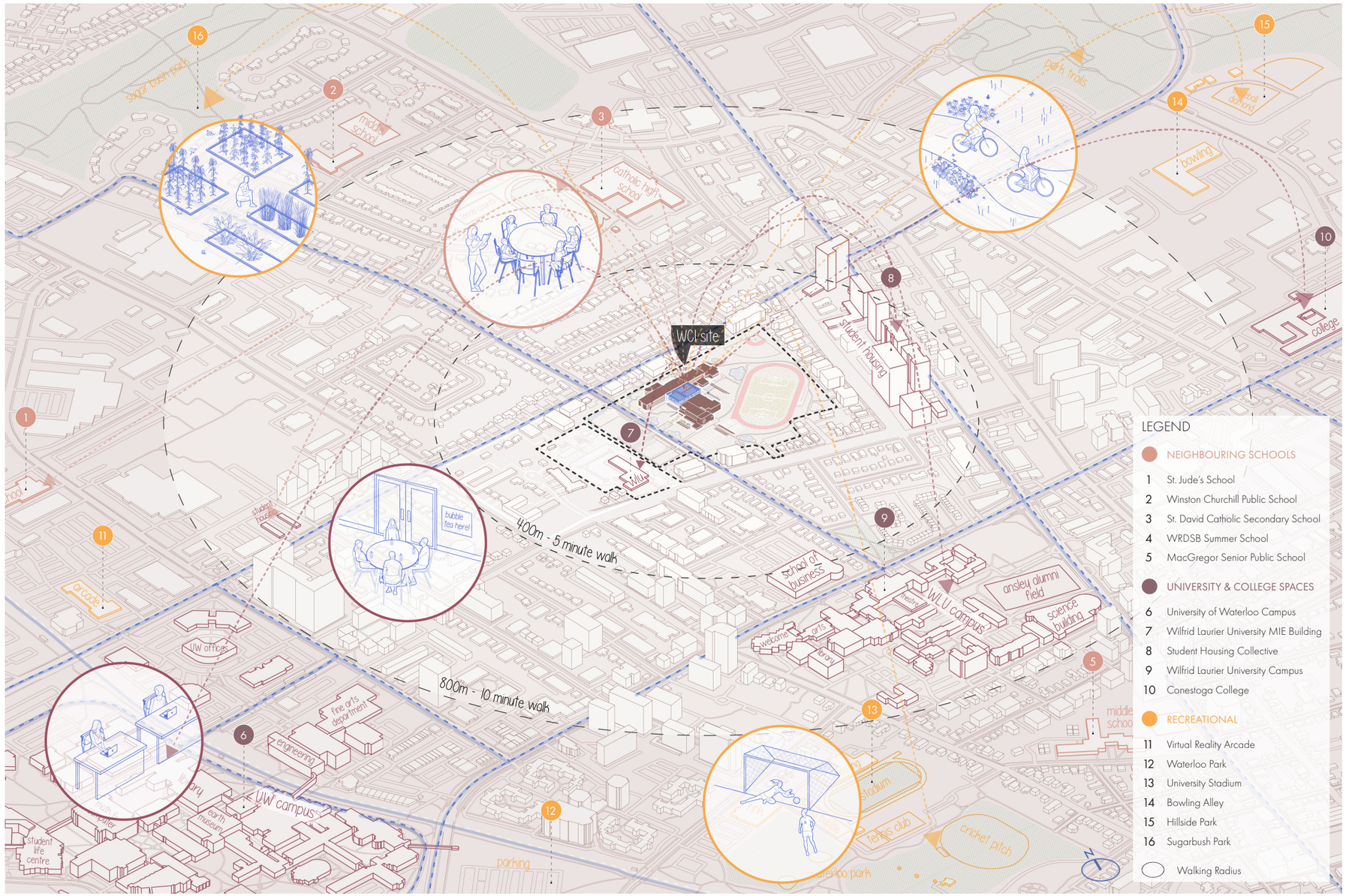


Fig. 4.70 Potential community connections for WCI

COMMUNITY OPPORTUNITIES FOR STUDENT PROGRAMMING

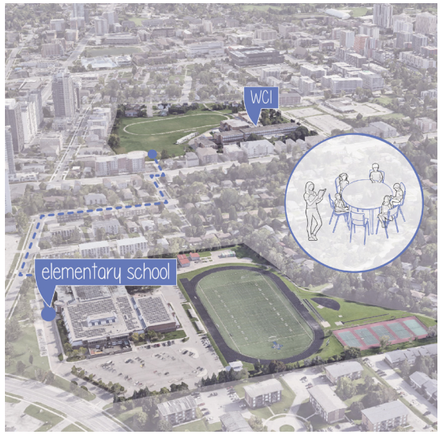
University Stadium



Located approximately a 16-minute walk from WCI, University Stadium is a large park featuring a variety of competition fields. While WCI already has a track and field, University Stadium offers significantly more space for larger sporting events and provides students with opportunities to participate in games and activities in a more expansive, engaging environment.

Fig. 4.71 Potential connection for WCI at University Stadium

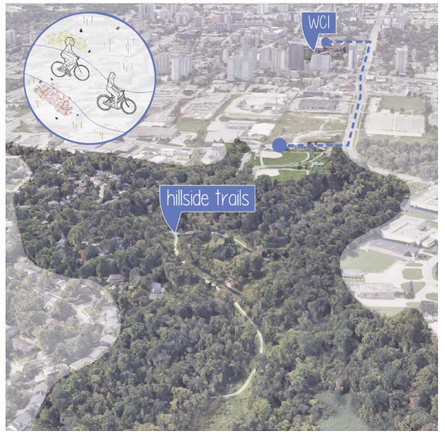
Neighbouring Elementary Schools



Neighbouring elementary schools provide valuable opportunities for secondary students to develop leadership and mentorship skills. Activities such as shadowing teachers, coaching or refereeing sports teams, and participating in volunteer programs allow older students to gain practical experience, support younger learners, and contribute meaningfully to the wider school community.

Fig. 4.72 Potential connection for WCI at neighbouring elementary school

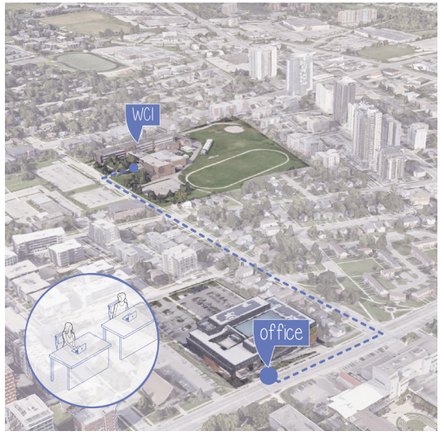
Trails & Parks



Local trails and parks can by a great space for students to engage in outdoor learning, particularly supporting those with strong naturalist intelligences. Hands-on exploration, discovery, and community connection can all unfold in these environments, especially during the warmer month.

Fig. 4.73 Potential connection for WCI to trails and parks

Offices with Internships Opportunities



Professional offices could offer students exposure to potential career paths through internship opportunities. These environments allow students to experience the realities of different fields and assess whether they align with their interests. At the same time, students can provide meaningful support to the offices they collaborate with, creating a mutually beneficial relationship.

Fig. 4.74 Potential connection for WCI to local offices

GAPS IN COMMUNITY PROGRAMMING

Lack of Green Spaces



As the Northdale neighbourhood continues to densify, public green space is becoming increasingly scarce. The small community garden across the street is insufficient to meet local needs, and the nearest dog parks and playgrounds are about a 30-minute walk away, highlighting the clear need for these amenities to be located closer to the community.

Fig. 4.75 Example of community garden in an urban setting

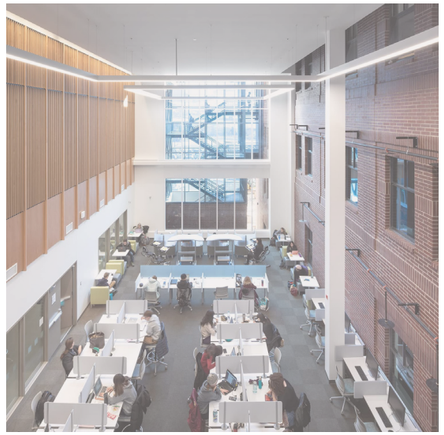
Lack of Community Gathering Spaces



Outdoor plaza areas have largely been replaced by expansive parking lots, reducing opportunities for community gathering. To create social spaces as well as encourage walking, cycling, or transit use, some school parking could be limited and converted into outdoor gathering areas for students and the community.

Fig. 4.76 Campus gathering space at Australian National University in Acton, Canberra, Australia

Lack of Open Office & Co-working Spaces



In the increasingly dense neighbourhood, many young professionals work from home in small apartments, creating a clear need for additional workspace options. Rentable workstations and offices for small businesses would provide a practical resource. Given the site's position between two universities and its largely young professional demographic, it is well suited for this program.

Fig. 4.77 UBC Okanagan Commons in Vancouver, BC

Lack of Quality Retail



Retail spaces in the surrounding area are predominantly chain businesses. The nearest farmers' market is St. Jacobs, which is highly tourist-oriented, extremely busy, and located more than 5 km away. The neighbourhood would benefit greatly from a small, community-focused farmers' market that supports local businesses and farmers.

Fig. 4.78 Kitsilano Farmers Market in Vancouver, BC

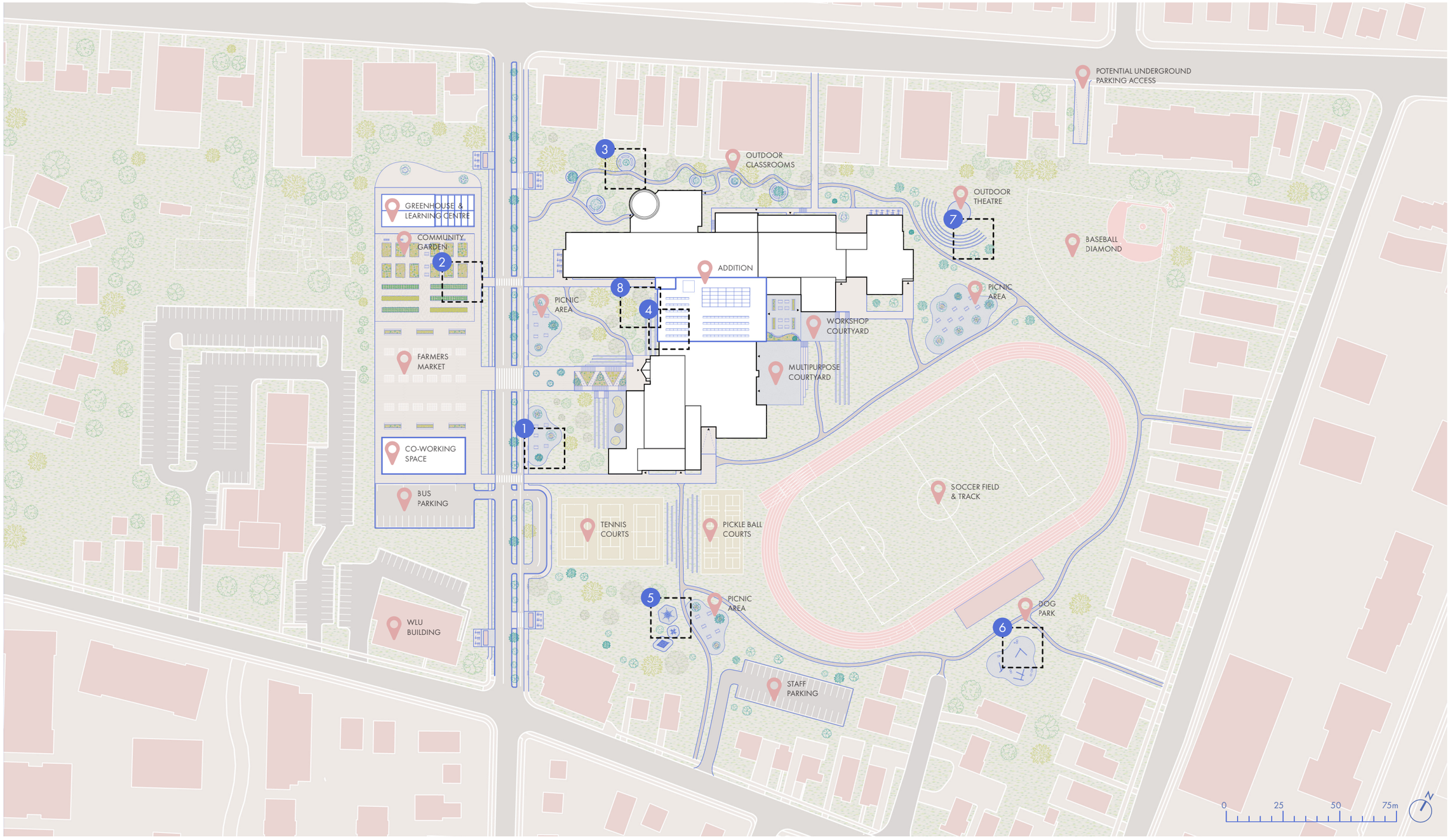
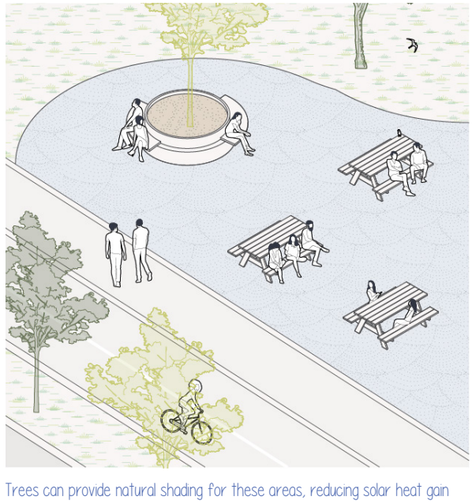


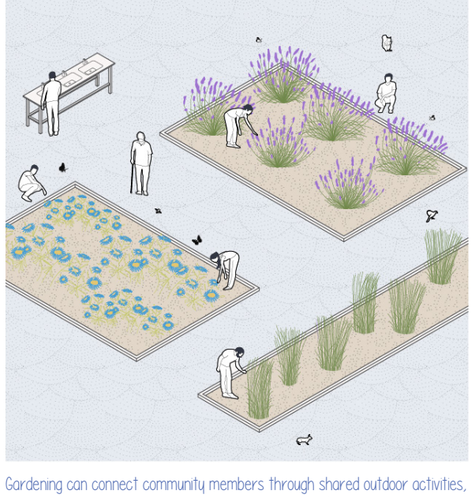
Fig. 4.79 Proposed site plan

1 Outdoor Seating & Picnic Area



Trees can provide natural shading for these areas, reducing solar heat gain and enhancing outdoor comfort.

2 Community Garden



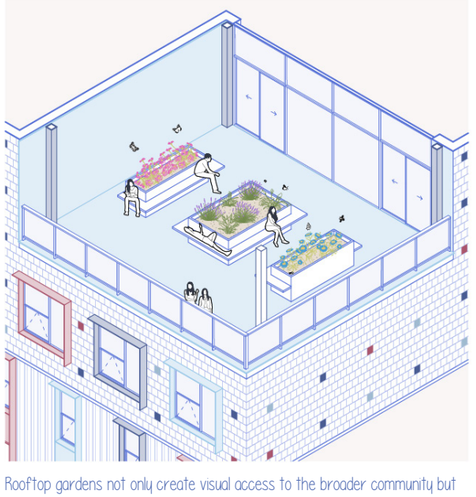
Gardening can connect community members through shared outdoor activities, with produce potentially sold at the proposed farmers' market.

3 Outdoor Classroom



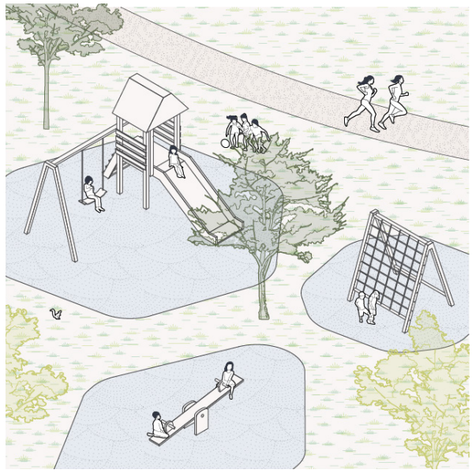
Conducting classes outdoors can provide a healthy and refreshing break in students' day while extending learning beyond the classroom.

4 Rooftop Garden



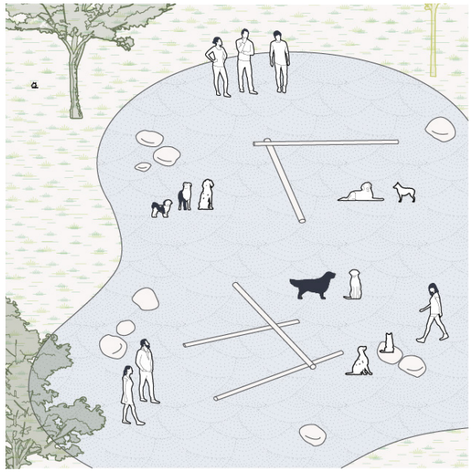
Rooftop gardens not only create visual access to the broader community but also serve as spaces where students can relax and reflect between classes.

5 Park & Playground



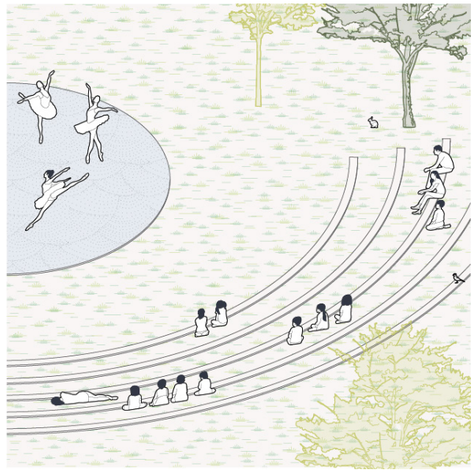
Playgrounds provide an opportunity to engage younger children on site and can serve as valuable resources for community programs, including daycares.

6 Dog Park



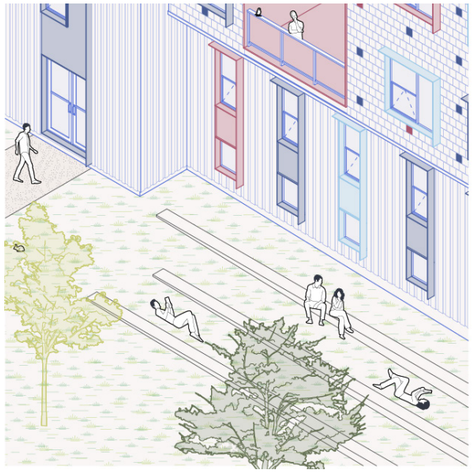
In addition to offering a space for pet exercise, dog parks can function as informal community gathering areas, encouraging social interaction and connection among residents, especially young adults.

7 Outdoor Theatre



Outdoor theatres provide students with opportunities to publicly perform and showcase their learning, while also serving as versatile spaces for community events and gatherings.

8 Informal Seating



Strategically placed outdoor seating throughout the school site can enhance the sense of openness and accessibility, making the environment feel more public and welcoming.

Fig. 4.8o Vignettes of proposed outdoor spaces



Fig. 4.81 Reimagined outdoor space

5.0 CONCLUSION

5.1 Renewing the Promise of Public Education

The practice of architecture has a great ability and responsibility to impact human experience. As children and adolescents, we may not remember every detail of our schools, but we remember how those spaces made us feel; whether a classroom felt welcoming or confining, whether the corridors felt bright or dark, and where we felt safe. With students spending nearly half of their waking hours in schools, these spatial experiences influence not only how they learn, but also who they become. This influence extends beyond the walls of a single classroom, shaping how students see themselves and how they find a sense of belonging and mattering within a community. As Herman Hertzberger stated:

> *Our characters as adults are rooted in the experiences we have as children, influenced in particular by our early built surrounds. As a child you need to be content both at home and at school in order to reach your potential. So, the onus is on architects, educators, and parents to try to provide the best environments for children to develop both intellectually and emotionally.*[1]

As demonstrated throughout this thesis, from the classroom to the building and community scales, Ontario's current physical learning environments are inadequate for 21st-century students. The standardized and rigid designs of post-war secondary schools have created spaces that hinder rather than foster curiosity, authentic learning, and well-being. Site visits to post-war schools in the Waterloo Region revealed that many of these spaces only just satisfy students' basic needs, such as providing a chair and desk for each student.

It is difficult for a student to explore their identity or develop a sense of mattering when their education, and the environments that shape it, feel generic and uniform. Students deserve to be recognized as individuals, not numbers, within a system. The architecture of education needs to empower students to take ownership of their learning, fostering agency, creativity, and connection. When thoughtfully designed, school environments can do more than accommodate education; they can inspire it. By creating spaces that feel safe, inclusive, and responsive to diverse needs, schools can become places of growth during the formative and often challenging years of adolescence.

To support this transformation, this thesis proposes an alternative path forward from demolition and rebuilding: adaptive reuse. By reimagining existing structures through a lens of accessibility, sustainability, and equity, Ontario can transform its outdated schools into productive educational spaces while drastically reducing carbon emissions, construction costs, and waste. This approach also preserves the cultural and social fabric of the communities these schools serve, reinforcing their role as civic anchors and places of shared memory.

1 Hertzberger (Foreword), Murray Hudson and Terry White, *Planning Learning Spaces: A Practical Guide for Architects, Designers and School Leaders* (Laurence King Publishing,), 9.

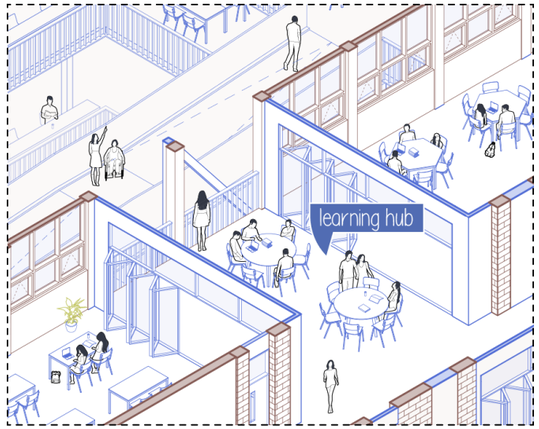


Fig. 5.1 A reimagined secondary school space

By first examining the challenges of adolescence, alongside contemporary pedagogical theory, case studies of innovative learning environments, and evidence-based design principles, this thesis develops a holistic redesign of Waterloo Collegiate Institute (WCI). The redesign demonstrates how post-war secondary schools can be renewed to align with contemporary educational values while still meeting school area standards and accommodating curricular requirements. The introduction of learning studios, adjustable layouts, transparent corridors, and interconnected spaces fosters collaboration, creativity, and self-directed learning. The architecture itself, acting as a third teacher, becomes an active participant in education, teaching engagement, adaptability, awareness, and responsibility through space. Beyond learning, these spaces informally foster meaningful social interactions and support student well-being.

For a transformation of this scale to become feasible, significant shifts would be required in funding structures, curriculum expectations, and the broader approaches of school boards and the Ministry of Education. Equally important, city councils, community members, school staff, parents, and students must share responsibility for initiating and supporting such innovations within their communities. In turn, the redesigned school site can reciprocate by giving back to the neighbourhood, becoming an active, 24/7 community resource filled with diverse, need-based programs.

The reimagining of Ontario's post-war schools is not just a design challenge but a social and environmental opportunity. By working with what already exists, preserving embodied carbon, respecting community identity, and enhancing accessibility, architecture can lead systemic change not only within education but across a range of community programs. With thoughtful retrofitting and design solutions tailored to each school's specific context, our schools can once again embody the promise of public education: to provide every "student with the opportunity to realize their potential and develop into highly skilled, knowledgeable, caring citizens who contribute to their society."[2]

2 "Education Act, R.S.O. 1990, c. E.2, c.25, s.1 | Ontario.Ca."

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*This thesis made limited use of OpenAI, ChatGPT (November 10, 2025 version), https://chat.openai.com/, as a writing support tool for editing to improve clarity and refine grammar. All ideas, arguments, and conclusions are my own.

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