

HORACE MANN ELEMENTARY SCHOOL | MODERNIZED



*Kids today are the future of tomorrow,
they shouldn't be scared for their
safety going to school.*

*Educating and Empowering All
Students to Succeed.*

~ Fargo Public School's Slogan



HORACE MANN ELEMENTARY SCHOOL MODERNIZED

A Design Thesis Submitted to the Department of
Architecture of North Dakota State University

By

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Degree of Master of Architecture

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Fargo, North Dakota

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Section A: Proposal

Thesis Proposal

December 13th, 2022

By

Brooke Krutsinger

throughout the school so if a door is open, they can clearly see why that is at any given time, and there can be a minimal amount of doors that can actually be used to enter the building. By adding these safety measures, and more, the school can take the necessary preventive steps to keep their students safe yet still provide a comfortable and effective environment to give them the best chance of having a bright future.



Figure 03 (Left); Figure 04 (Right)

Children today are the future for tomorrow, and keeping them safe and helping them learn, both in school and in society, is important to everyone. As a bus driver, I see students every day getting on the bus to go to school and to go home at the end of the day, and I see how important it is that we, as a society, help them get to school, stay in school, and keep them safe. I have been working for Valley Bus LLC since 2019, and I have since done every Fargo bus route at least once, if not multiple times. From that and coming back full swing after the COVID-19 pandemic, I can confidently say that kids need more attention than what they are getting now. From schools being understaffed, underfunded, and overpopulated, students have a hard time creating positive connections with anyone, and that just creates a vicious loop of students acting out, staff not knowing, caring, or getting frustrated, and nothing being done about it.

To break that loop a lot of things need to happen but a start would be protecting and supporting the students and the staff, creating a positive environment for everyone. Violence of all kinds is rising but gun violence on school grounds shouldn't be tolerated, and preventative steps need to be taken. According to Education Week, in 2022 there were 51 school shootings, leading to 40 people being killed and over 100 people being injured. That is a prime example of how the problem is growing since in 2019, there were 24 school shootings, in 2020 (COVID-19 pandemic) there were 10, and in 2021 there were a total of 35. These numbers just include the times there were deaths, they do not include the number of threats, or any other mass shootings in the United States.

School Shootings (defined by Gun Violence Archive): An incident that occurs on property of the elementary, secondary or college campus where there is a death or injury from gunfire.

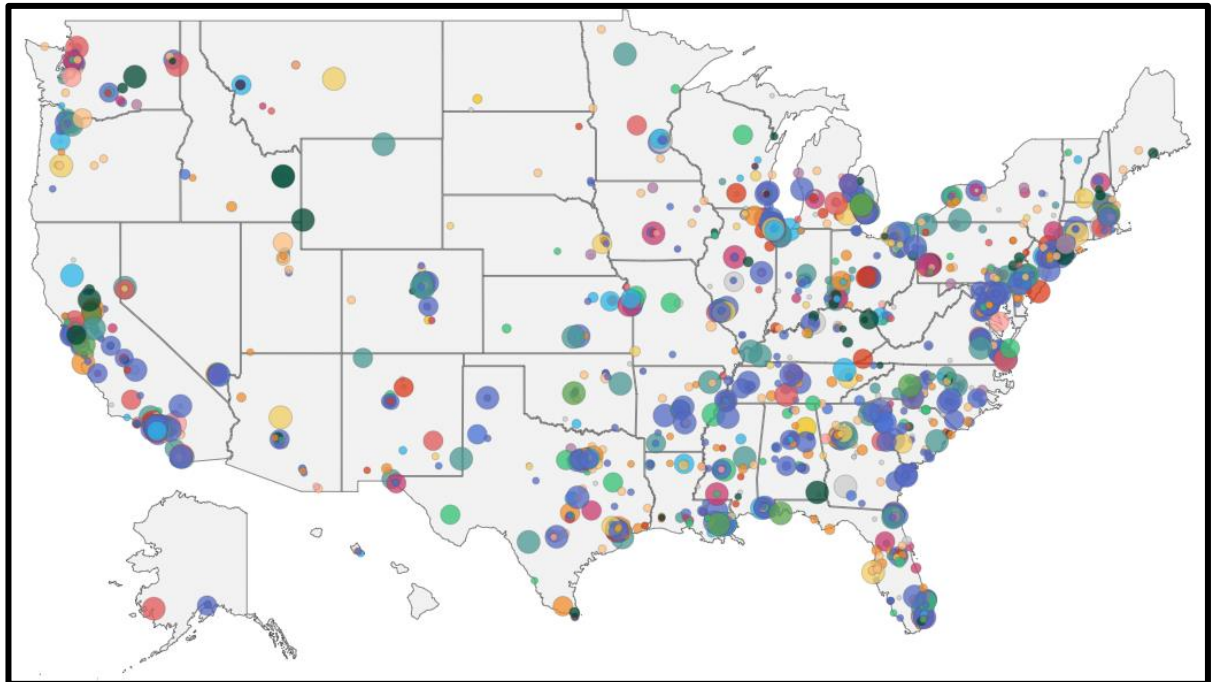
With the rising number of gun violence throughout America, parents, students, and communities have many fears for their safety, but going to school should not be one of them. That is why districts need to plan and prevent violence in schools as much as they can. Districts, local law enforcement, and staff should communicate and produce a procedure in case something does happen, and just like a fire emergency, drills need to take place to practice for everyone, students included, to be prepared.

That is why I am proposing an updated school that has safety for students and staff as my focus, yet still creating a positive and effective

learning environment. Fargo, ND, is growing and needs bigger schools, as a result, I am taking advantage of the possibility of rebuilding one of their older elementary schools. The site is located on the corner of 3rd St. N. and 11th Ave N. in north Fargo, and currently is home of the 107-year-old building, Horace Mann Elementary School.

I plan to design a school that has updated technology for classrooms and safety as well as creating more of a capacity to hold more students. Though there has never been a school shooting in North Dakota, there has been threats, and with gun violence on the rise, I believe that there should be greater guidance for preventing a tragic event ever happening.

Figure 05: Map of School Shootings from January 1970 to June 2022



According to the Homeland Security Database, there were a total of 2,069 shootings, 684 deaths, and 1937 injuries in that time frame.

Safety in schools is a growing concern for parents and students, whether it be from bullies, students' health or an emergency, schools are supposed to be a safe space for students to learn and grow.

“In the industrial era, schools developed as highly controlled environments to instill the discipline to thrive in a machine age. Now, to prepare pupils for success in a knowledge economy, the evolving typology is more fluidly conceived to provide flexibility, connectivity, and spaces for social and educational encounters.” (“Typology: Schools - Architectural Review”) (Kuhn, 2012)

In Fargo, ND, the question of children's safety both inside and outside of the school is a concern to many, and with the tragic event such as the school shooting in Uvalde, TX being a fresh topic in the news, does not put a parent's minds at ease. However, the Fargo Public Schools District can learn from the past and prepare more for the future in case such an incident does occur, and since Fargo is continuing to grow, new schools are needed and that is a perfect time to start preparing and learning from others.

Case Study A – Bennett Elementary School (Fargo, ND)



Figure 06 (Above)

Address: 2000 58th Ave S, Fargo, ND 58104

Architects: Mutchler Bartram Architects

Date: 1999-2000

Being local, Fargo is continuing to grow further south, and Bennett Elementary is prime evidence of such. In the school year of 2022/23, its average student population is 627, making it the largest elementary school in the district.

Bennett Elementary School was built in 2000 and was designed with circulation as the focus. They did research to make sure there was a connection between school and the neighborhoods for safe commute for the students and parents. They also added a 'school zone' speed limit and is often enforced by law enforcement as well as the school's staff.

Safety around the building was a big concern, the district wanted to create safe paths for walking/biking yet still consist of an efficient route to the main roads that does not create more congestion for drivers. As seen below, in the creation of the area, the circulation of pedestrians and their safety was a priority, for more information on pedestrian traffic and how the design came to be, see Appendix A.

Safety inside the building was just as important as outside to the district when designing this building. The exterior walls being brick and/or cinderblocks with interior walls being a mixture of cinderblocks as well as plaster. The bricks and blocks are strong and sturdy material that in case of an emergency, such as an active shooter, would ideally prevent any stray bullets going through and hitting a student or staff member. The material also is strong during a storm, such as a tornado, with high wind speeds and/or the cold.

Figure 07: 2000 58th Ave S, Fargo, ND 58104 in the year of 1999

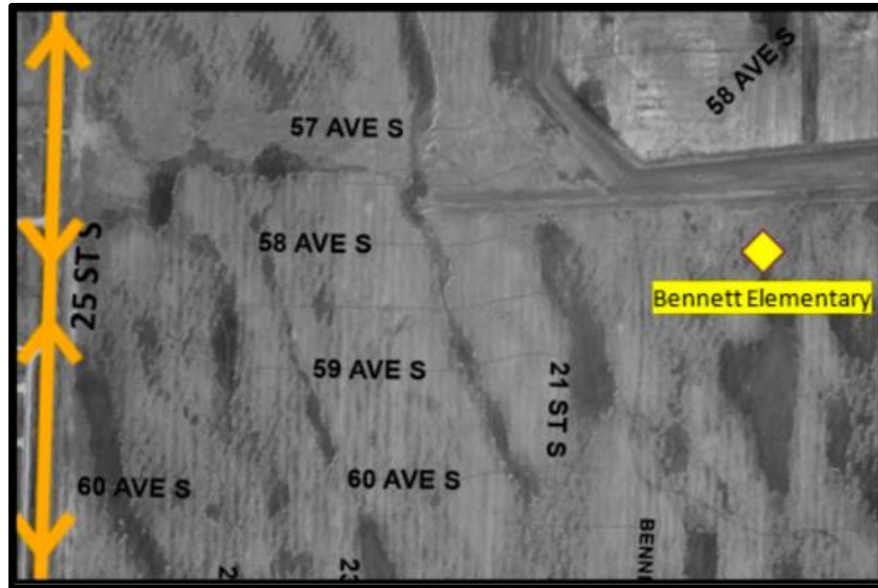


Figure 08: 2000 58th Ave S, Fargo, ND 58104 in the year of 2021



Legend	
	Major Roadways
	Minor Roadways
	Major Walking & Biking Paths
	Average Sidewalks
	Speed Enforcement and Traffic Controls

Case Study B – Robb Elementary School (Uvalde, TX)



Figure 09 (Above)

Address: 715 Old Carrizo Rd, Uvalde, TX 78801

Architects: Unknown (For new construction the architects are to be Huckabee, out of Fort Worth, TX)

Date: 1960's (New construction to be started in June of 2023 and completed in October of 2024)

May of 2022, the Robb Elementary School in Uvalde, TX was under attack by a gunman who walked into the school and killed twenty-one people, along with injuring seventeen. The tragedy was noticed all through the nation and discussions about how the local law enforcement reacted became a heated topic in many districts. However, with the inability to change how people reacted, the event scared many students and parents from going back to school.

On Tuesday, June 28th, it was announced that the school will be torn down and rebuilt. News from the district stated that it is unknown what grades will be held at the location but will have "...educational, technological and security enhancements." The projected opening of the school is October 2024, and the design of the building will be donated by Huckabee, an architect firm based out of Fort Worth, TX.

The original building is due to be torn down and replaced with a memorial of the lives that were lost on that day, and the new school will be moved to an intersection that has good access on all sides, which is ideal for bus routes and emergency vehicles to gain access to the location. Similarly, to the original building, the structure will still hold grades 2nd through 4th grade and whereas the original school was able to hold about 550 students, the new school is going to be bigger to be able to encourage the growth of the area.

There is something to be learned about how the tragic event occurred, where there was some sort of miscommunication between what the procedure was from the local law enforcement to what really happened. As

seen in Appendix B and C, the timeline of events was tragic, and the town was unprepared, which can be a revelation to schools all over the nation to see if their enforcements are ready to do as such.

Figures 10 – 13: Interior Photos of the original Robb Elementary School



Figure 08



Figure 09

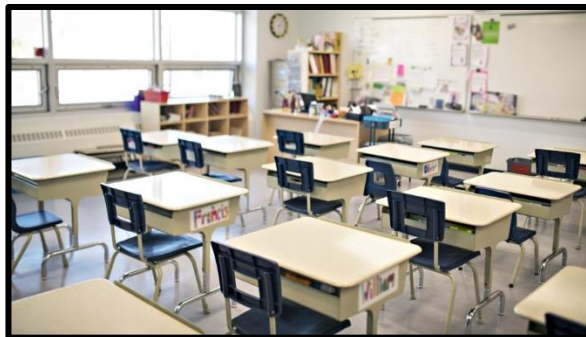


Figure 10



Figure 11

Case Study C – Sandy Hook Elementary School (Newton, CT)



Figure 14 (Above)

Address: 12 Dickenson Dr, Sandy Hook, CT 06482

Architects: Svigals + Partners

Date: Completed in 2016

December of 2012, Sandy Hook Elementary School was attacked by an armed man who took the lives of twenty-eight students and staff, along with injuring two more. At the time, this news went across the nation, but the town of Sandy Hook is making strides to a bright future, including the new school that was completed in 2016. After the incident, the school was torn down and redesigned and built with safety, particularly from a shooter, in mind.

Even though safety for the students and staff was their main concern, the district still wanted the school to still interact with the students and improve creativity and learning throughout the grades. One thing that is noticed is the number of windows present in the new school, which is not necessarily a terrible thing. Some may argue that windows are less safe compared to a solid wall, but others can argue it is much safer. First, natural sun light is good for the health of students and staff, but with the floor to ceiling windows at the new Sandy Hook Elementary School, it also gives a wide view to the outside, or in some cases, any incoming threats.

Safety for the students and staff does not always have to mean a big piece of expensive security system, but it can be just the simple automatic doors that lock on a schedule, and which can be locked or unlocked electronically. Systems like this keep a point of access to a minimum, especially during school hours. Schools all over the nation are picking up this system and whenever someone wants to enter the building, an administrator

of the school must grant the entry, and usually, the person must go through the primary office before entering the rest of the building.

Even though safety is the number one priority, making a positive learning environment is important as well. That is why the district and the firm worked together to make an interesting interior and exterior to keep kids drawn to the school and in hopes of making it more fun as well. The design plays with simple shapes to make the structure more dynamic and provides more than what meets the eye.

Shown in the exterior and interior photos below, you can see how the schools interact with the students and public to make it more intriguing, but still be efficient and safe as you can see in the floor plan, Appendix D.

Figures 15 – 17: Exterior Photos of Sandy Hook Elementary School

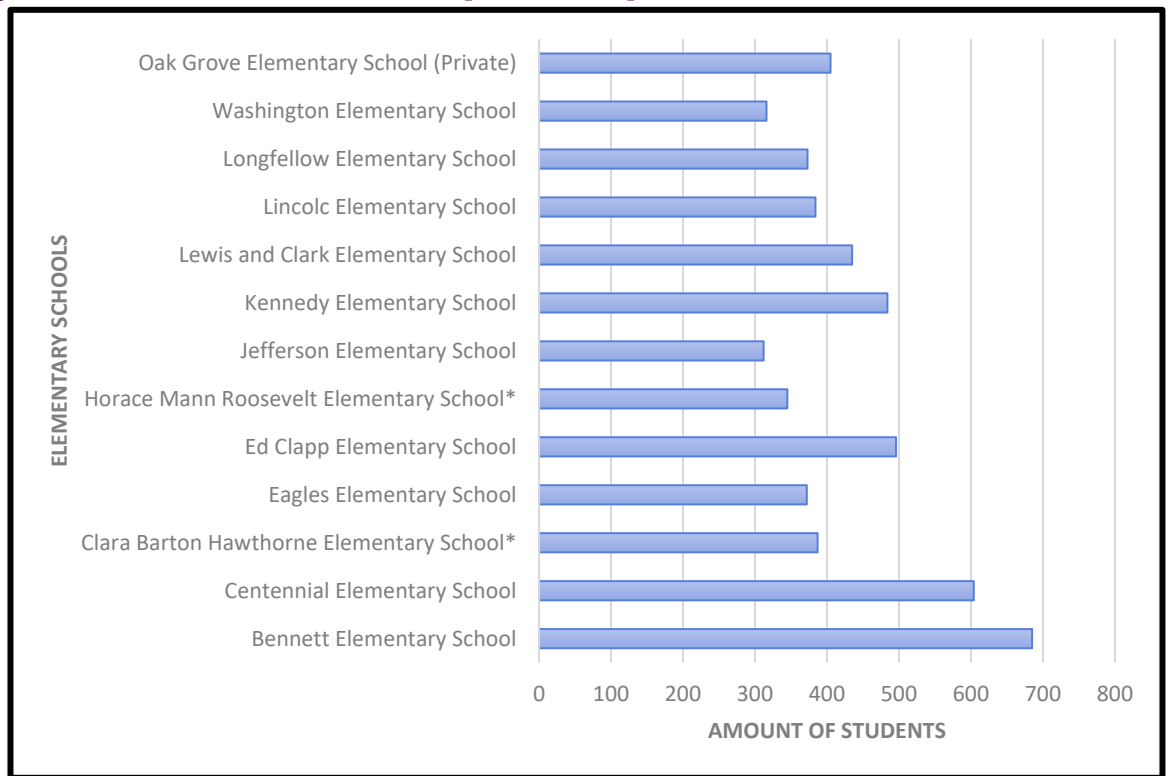


Figures 18 – 21: Interior Photos of Sandy Hook Elementary School



In the Fargo Public School District, there are a total of fourteen elementary schools, three middle schools and four high schools. However, Fargo is continuing to grow further south, and Bennett Elementary is prime evidence of such. In the school year of 2021/22, Bennett Elementary had 685 students, whereas the average elementary school size in Fargo was 381 students, ranging from 312 to 685 (Bennett being the largest). The elementary schools that are apart of North Fargo are getting smaller in numbers, making the boundaries grow to keep the student population even throughout the district.

Graph 01: Student Population for Each Elementary School in the Fargo Public School District (2021/22)



*These schools are K – 5th but are split into two separate buildings.

According to Chris Pickney, the liaison between Fargo Public Schools and Valley Bus LLC., the discussion to combine elementary schools in North Fargo to empty and rebuild another, is very plausible. The goal would be to create a bigger school for North Fargo to have accessibility to get the numbers even throughout the district. As shown below, North Fargo has six Elementary schools, and has some of the lowest numbers, however, shown in Figure 20, you can see the possible solution to even the number of students between north side schools and the growing south.

Figure 22: Map of North Fargo's Elementary Schools



Figure 23: North Fargo's Elementary Schools Combination



If a new school, with a bigger capacity, is built and renewed, then more students can be brought to the school and ease the growing numbers of the South Fargo elementary schools. Horace Mann was built in 1915, and has not been updated much since, and currently holds grades Kindergarten to first grade, where Roosevelt holds the rest, from second grade to fifth grade. Even though South Fargo is the part that is growing, the need for more schools is

due to the size of the first schools built in Fargo, which are the north side schools.

The long-term goal for North Fargo would be to rebuild Horace Mann Elementary School, to then eventually getting to rebuild Roosevelt Elementary School and make it a full school as well, meaning it will have K – 5th Grade, and then eventually to just update Madison Elementary School. These changes would not only update the learning environment for the students and make them have a positive interaction with their communities but to also grow the overall capacity and even out the numbers of the schools to the south.

Being part of the older of Fargo, the schools often do not have updated equipment to help keep the students safe. Horace Mann recently updated the entry system in having to 'buzz in' to enter the building during school hours, but that does not include every entrance. Being built over a century ago, the school simply does not have the size for major remodels inside or out, and needs to utilize the space that it currently has.

There is recent discussion on rebuilding Horace Mann Elementary School to have a higher capacity to ease growing numbers in Fargo, ND. Being over a century old building as well, safety is also a concern with parents in the area for fear of being out-of-date compared to the increase in crime rates. That is why the new design needs to focus on its capacity, as well as safety.

Capacity:

The first noticeable thing to focus on is the general size of the school, due to Fargo growing more and more each year. When the school was first built, the need of a large school was not necessary, yet the lot size is about 180,000 sqft and the building's footprint is only about 13,500 sqft (about 8%) of the entire lot, meaning there is plenty of room for a larger school, as well as keeping enough outdoor space for the students and residence to enjoy.

Safety:

The students' safety has always been a concern for the district, along with the parents, and with the increase of violence and crime across the nation, there needs to be measures put into place now. There are simple things that could help secure the school grounds and building as well as technology to further make the school grounds safe, but something simple as automatic locking doors can help keep out any intruder.

01 – Perimeter and Exterior Receptions

The perimeter of a school should be inviting and interactive with not only the students but also the public. Wanting it to be inviting but still safe can be a demanding thing to do, because you do not want just anyone to be able to walk up to the school during school hours but still have the playground and green space accessible for the kids to enjoy in the area in the evenings and weekends.

Elementary schools are known for their playgrounds and fields by the public surrounding them. Circulation is crucial to have pedestrians and vehicles co-exist safely and efficiently in the same area. During the school year, especially, the area will be congested with parents and school buses dropping students off, along with children walking, biking and roller blading with and without parents near.

02 – Cafeteria

The cafeteria, for many, is a meeting ground for students not only for lunch, but as well as in the morning and after school. The layout needs to be efficient for dozens of kids to line up, get their food, sit down to eat, and discard their trays in a timely matter that can stay on schedule. The space also needs to be central throughout the school and have a kitchen suitable for the number of kids they are feeding.

03 – Classrooms

Classrooms need to be the most inviting for students but still be productive for learning and teaching. The acoustics, lighting and material all contribute to how the students learn and how the teacher teaches their lessons. The layout needs to be effective for the rush of students entering and exiting the space for both regular and emergency use.

If there was an emergency, there needs to be a plan for how the teacher, and students, react and the room needs to correspond with whatever that is. Whether it be a fire drill, where everyone must leave the building quickly but safely, or a lockdown, where the classroom needs to be a safe space where the class can hide.

04 – Extra Curricular Spaces

Every school has clubs, sports, music, theatre, and more, and even an elementary school needs to be accommodating. There needs to be a space where a group of kids can meet and collaborate to do their activities and learning. These spaces typically correspond with classrooms but are not assigned to a specific class to have the same atmosphere but be separate from their normal classrooms.

05 – Gymnasium

Gym class is always a highlight to many kids, it is a space for them to use energy and to reset for the remainder of the day. It is crucial for the space to be extremely interactive with the kids and to be large enough for them to play sports and do other activities. This space needs to be able to be used for a shelter in case of an emergency such as an intruder, or weather.

06 – Library

The library needs to be interactive and attractive for kids to be excited about books and events that are held in that space. Similar to the gymnasium, acoustics are important so when there are dozens of kids in the room, the noise is not echoing in making it worse. This space needs to be used for a shelter as well, in case of an emergency.

07 – Parking

In an elementary school setting, the only parking needed is for the teachers and staff, but also needs to have space if there were to be an event held at the school. The parking lot also needs to be accessible for the staff to get to safely and efficiently to and from the building.

For school buses, the drop off and pick up zone needs to be a sidewalk away from the building, meaning that the students do not cross the street or get into the street to get in or off the bus. The exterior and surroundings of the building need to be accessible for the bus to safely turn and drive around the school.

Fargo Public School District

The school district wants the best for its students but still must follow a budget and government guidelines. They have strict codes to follow for the design of the school as well that, especially fire codes, get checked yearly. So has a client, they might be strict and meticulous, or even tight on price of materials.

Teachers and Administration Staff

The staff of schools are the ones that use the space more than anyone else, even compared to students, they use every inch of their classrooms, offices, lounges, etc., so creating the space to make their jobs easier or more efficient would help everyone involved.

Students, Parents, and the Public

Along with the staff, students will be spending a significant amount of their time in the school, especially their classrooms. Making the space accessible and interactive for the kids will not only make them happy but as well as their parents. Parents' main concerns are often safety, happiness and that their kids are learning, so as an audience, it would be a priority to make a positive environment for the kids.

The public, if the building's exterior is pleasing to the eye, and there is green space as well as outdoor structures that can be interacted with, would be happy with the change.

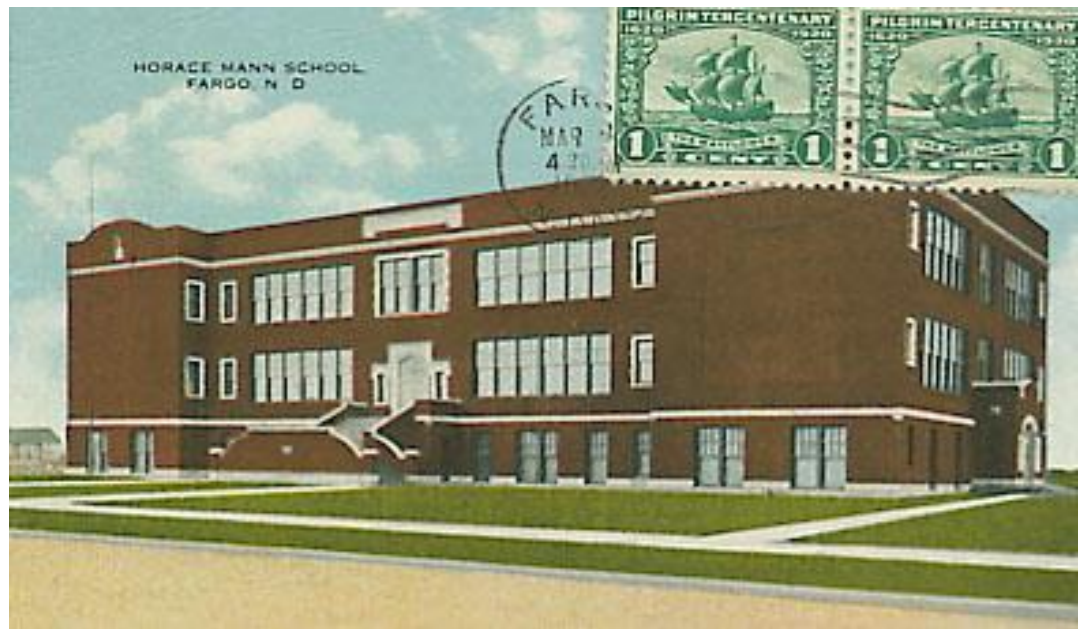


Figure 24 (Above)

Address: 1025 3rd St. N., Fargo, ND 58102

Architects: Unknown

Date: 1915

The current site holds Horace Elementary School that was built in 1915. It currently holds 345 students, Kindergarten through first grade and has about 25,000 square feet of interior space. Shown in Appendix E, the calculated routes to the school and general issues that were faces were corrected or designed around.

As seen in Figures 23 and 24, the site has not changed much from 1999 to 2022. Even though there is an abundance of green space on the current site, the building is not only outdated but does not utilize the space either. The current neighborhood is not very active, mostly just with vehicles driving past, but not a lot of foot traffic, and if a new construction would happen, it could create an inviting atmosphere compared to what it is now.

Figure 25: 1025 3rd St. N, Fargo, ND in the year 1999

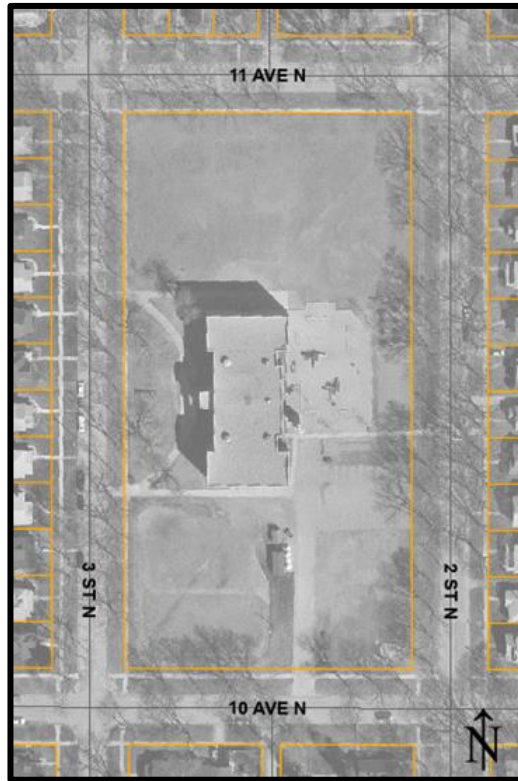
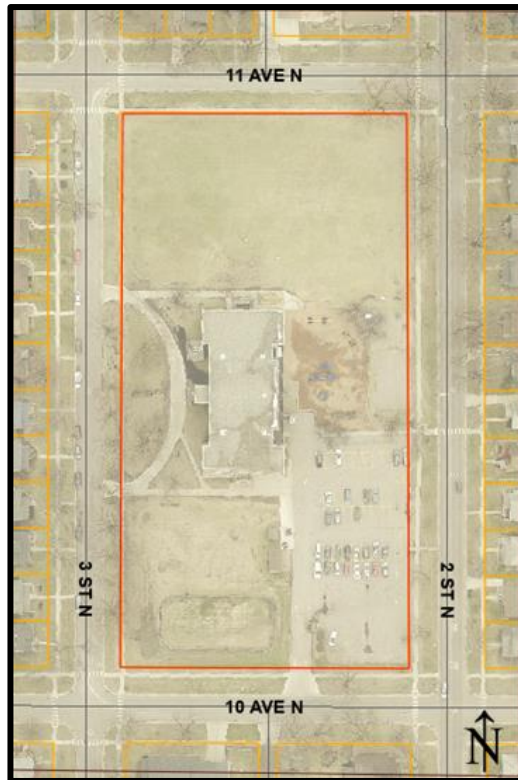
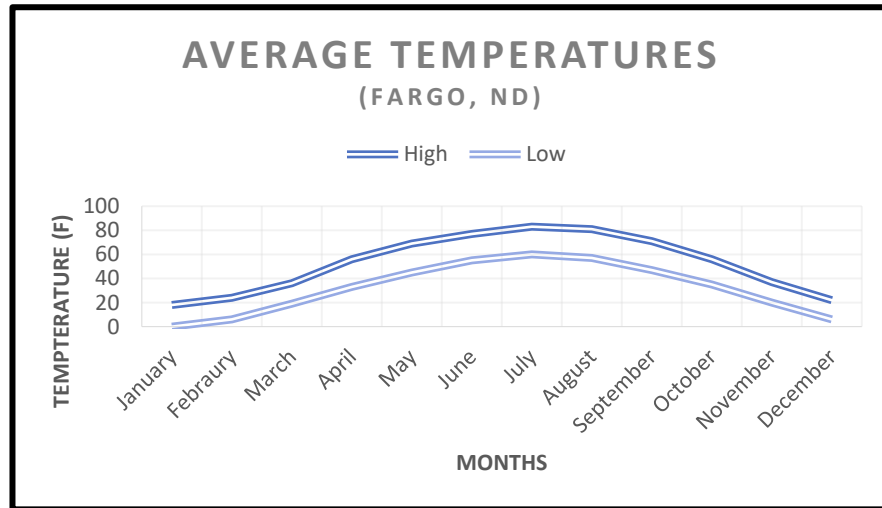


Figure 26: 1025 3rd St. N, Fargo, ND in the year 2022

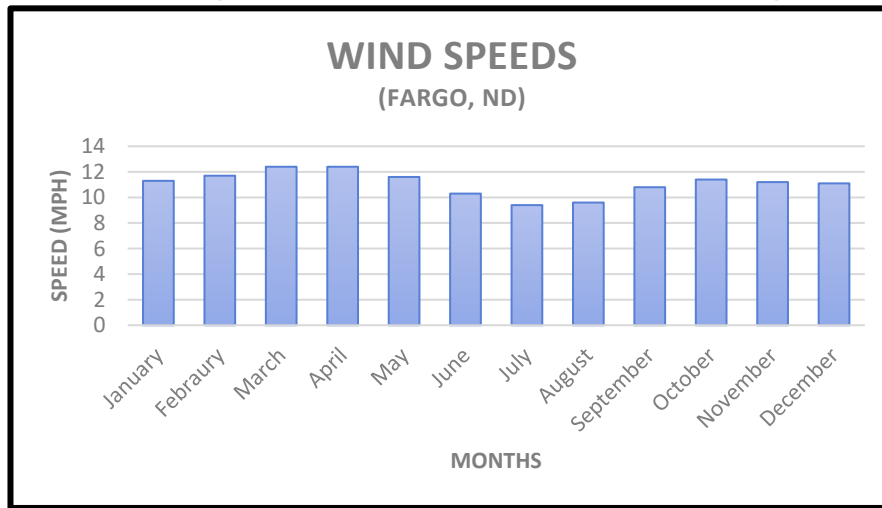


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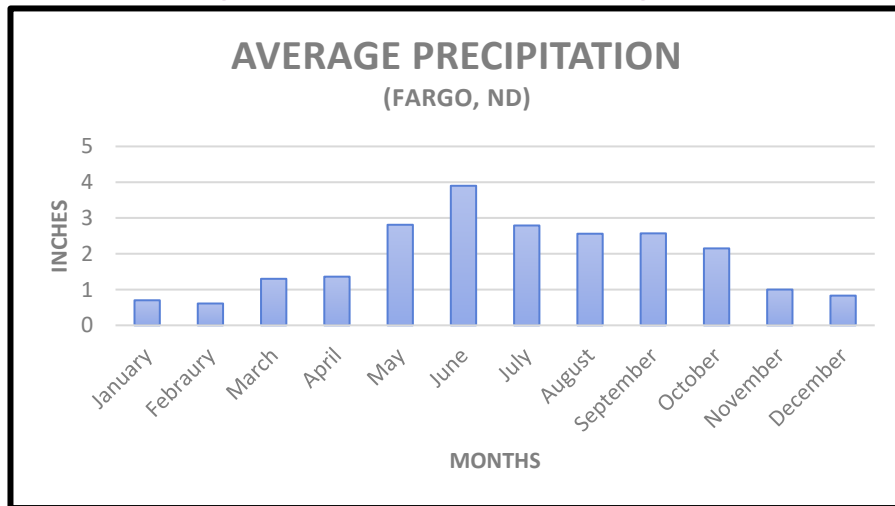
Graph 02: Average Temperatures (Fahrenheit) in Fargo, ND.



Graph 03: Average Wind Speeds (mph) in Fargo, ND.



Graph 04: Average Precipitation in Fargo, ND.



Goals of the Thesis Project

The goal of this thesis is to create a safe environment for students that is interactive and is an effective learning space for grades kindergarten through 5th grade. Gun violence is a growing pandemic across the nation and even though North Dakota has never had a school shooting, plans and procedures needs to be in place in case it does happen. Just like fire drills, schools use equipment to help notify staff and students as soon as possible and the schools all practice having a fire drill so many times a year.

Another goal for structure is to increase its capacity for students to ease the stress of numbers to other schools in Fargo, ND. Horace Mann Elementary School is currently exceedingly small compared to others, and only holds kindergartners and 1st graders, yet has space wasted in the current lot. With a bigger building, safer material as well as a floor plan designed for efficiency and safety, a new Horace Mann Elementary School would be a powerful addition to Fargo, ND.

A Plan for your Design Methodology

Can the floor plan design, and materials chosen, be used to create a safer environment for students and staff members of an elementary school if an emergency occurs? Between doing research on materials, I will be working with the Fargo Public School District and the local law enforcement (The Fargo Police Department) to help the floor plan interact and work together with the procedures of emergencies from both departments. From extreme weather to an active shooter, the floor plan will help the staff of the school and local law enforcement to keep everyone safe but still provide an effective learning environment.

A Plan for Documenting the Design Process

The design process will go through multiple transformations after taking advise from the research of the case studies, the school district, and local law enforcements and will all be noted, and no progress will be deleted but just archived for the ability to look back if needed. All interviews and research will be documented and brought into the design process.

Specific Schedule for the Project

This schedule is due to change and will be updated to be accurate with the current planning.

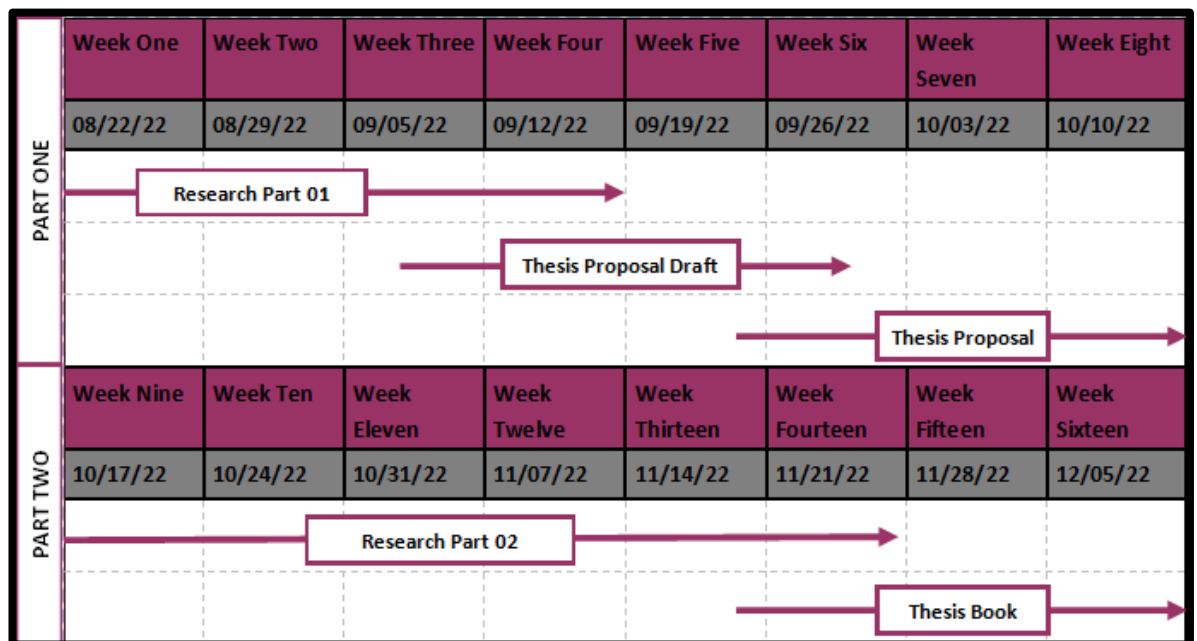


Figure 27 (Above)

Section B:

Research Details and Results

Thesis Research

December 16th, 2022

By

Brooke Krutsinger

After learning the program AnyLogic, I entered in a normal day of grades Pre-K through 1st grade on the first floor of the new Sandy Hook Elementary school. Once an average day went through, I added an 'agent' to act out an active shooter to see how fast students and staff can take shelter. With the innovative design of the school, it was clear that the safety of the students and staff were their number one priority. Shown in images below, there were storage rooms that had no windows and only one entrance throughout the entire school, so no matter where a person or a class was, there was somewhere reachable that they could either take shelter or get out of the school.

Figure #28: Preschool Classrooms on an Average Day (11 o'clock in the morning)



As seen in Figure #26, you can see a normal school day, specifically the preschoolers, at about 11 o'clock in the morning, most classes are in their classrooms, some are walking in the halls, some are in the library and in the gymnasium. However, even though it is not always likely, events, including weather or emergencies, can change the course of student's schedules. In Figure #25, it simulates what an average lockdown could look like, this specific example is a kindergarten class was in the hallway and went to the nearest storage room.

The significant difference between a lock down and a real emergency is that the reaction time for each class and the location of each class can be different. In a lockdown drill, the office announces that it is a practice drill over the speakers and that all classrooms must perform as if it was real. In this case, all teachers and students know at the same time as everyone else, so if there

were an active shooter, that intruder would not have gotten far throughout the school.

Figure #29: Kindergarten Class taking shelter in a storage room.



In a real emergency, the only time the alarm would go over the speakers to communicate that there needs to be a lockdown is when the office knows. If the intruder enters in a different door, whether a maintenance door or is already in the school, the office would not be the first to know. Some classes would have already heard or seen the shots before someone in the office could have sounded the alarm. It can clearly be seen the differences between how many are already hiding after one minute of the announcement, and how many are hiding after one minute the intruder is in the school.

Another major difference is that most practice drills happen when most, if not all, classes are in their classrooms and the teachers are usually told ahead of time, yet, in a real emergency, there are no early notifications. Some classes will be in their rooms, but some may be in the halls, in the library, etc., and that is when all the practice they did before is not as useful. If one class was walking in the hall when the alarm starts or they hear the intruder, they need to quickly evaluate and determine what to do. Even though no amount of practice can make a clear path of what to do, if there were at least a variety of locations practiced, a teacher and the students would have more confidence thinking of a plan to keep safe no matter where they are in the school.

However, with Sandy Hook's new floor plan, safety during an emergency was clearly a priority during the design. Seen in the figures and the floor plan, storage and mechanical spaces are throughout the school and most have no windows, and only one door to enter or exit. Meaning that if the class were in the hallway and needed to seek shelter, they would have a space to go close.

Creating and researching Sandy Hook's floor plan in the simulation shows how they learned from the tragic event and found new ways to keep students safe yet still create an effective learning environment. Having storage and mechanical spaces throughout the school, bathrooms and open classrooms and offices, creates security no matter where the people may be in the building.

The pieces that I would like to take away are the secure spaces throughout the building and the materials that were used in construction. Some, however, that I believe would help the goal of safety, are more doors to outside throughout the school, such as in classrooms. All classrooms are on an exterior wall, and if there was an emergency, such as an active shooter, the ability to exit the building in general could be an option more most classrooms and they would be able to run from the situation and get to safety rather than hide and wait.

The Sandy Hook shooting swept the nation with the tragic news, but hopefully, with the updated school, it can create a fresh and safer start for children and parents, to start strong for a better future. No amount of practice drills, certain material, cameras, and security can eliminate the chance of a dangerous event, but there are ways to start, and Sandy Hook Elementary is an example of just that.

Safety in schools is a growing concern for parents and students, whether it be from bullies, students' health or an emergency, schools are supposed to be a safe space for students to learn and grow.

"In the industrial era, schools developed as highly controlled environments to instill the discipline to thrive in a machine age. Now, to prepare pupils for success in a knowledge economy, the evolving typology is more fluidly conceived to provide flexibility, connectivity, and spaces for social and educational encounters." ("Typology: Schools - Architectural Review") (Kuhn, 2012)

In Fargo, ND, the question of children's safety both inside and outside of the school is a concern to many, and with the tragic event such as the school shooting in Uvalde, TX being a fresh topic in the news, does not put a parent's minds at ease. However, the Fargo Public Schools District can learn from the past and prepare more for the future in case such an incident does occur, and since Fargo is continuing to grow, new schools are needed and that is a perfect time to start preparing and learning from others.

Case Study A – Bennett Elementary School (Fargo, ND)



Figure 06 (Above)

Address: 2000 58th Ave S, Fargo, ND 58104

Architects: Mutchler Bartram Architects

Date: 1999-2000

Being local, Fargo is continuing to grow further south, and Bennett Elementary is prime evidence of such. In the school year of 2022/23, its average student population is 627, making it the largest elementary school in the district.

Bennett Elementary School was built in 2000 and was designed with circulation as the focus. They did research to make sure there was a connection between school and the neighborhoods for safe commute for the students and parents. They also added a 'school zone' speed limit and is often enforced by law enforcement as well as the school's staff.

Safety around the building was a big concern, the district wanted to create safe paths for walking/biking yet still consist of an efficient route to the main roads that does not create more congestion for drivers. As seen below, in the creation of the area, the circulation of pedestrians and their safety was a priority, for more information on pedestrian traffic and how the design came to be, see Appendix A.

Safety inside the building was just as important as outside to the district when designing this building. The exterior walls being brick and/or cinderblocks with interior walls being a mixture of cinderblocks as well as plaster. The bricks and blocks are strong and sturdy material that in case of an emergency, such as an active shooter, would ideally prevent any stray bullets going through and hitting a student or staff member. The material also is strong during a storm, such as a tornado, with high wind speeds and/or the cold.

Figure 07: 2000 58th Ave S, Fargo, ND 58104 in the year of 1999

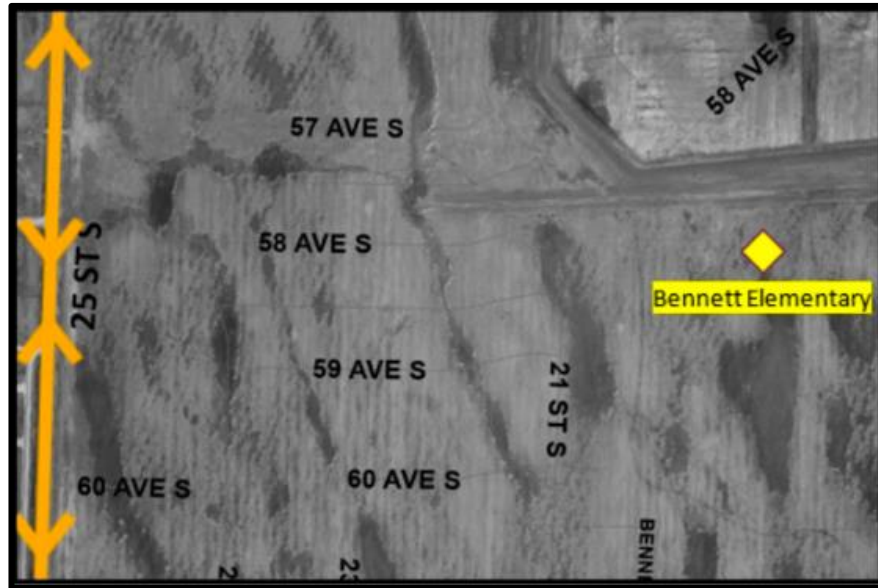


Figure 08: 2000 58th Ave S, Fargo, ND 58104 in the year of 2021



Legend	
	Major Roadways
	Minor Roadways
	Major Walking & Biking Paths
	Average Sidewalks
	Speed Enforcement and Traffic Controls

Case Study B – Robb Elementary School (Uvalde, TX)



Figure 09 (Above)

Address: 715 Old Carrizo Rd, Uvalde, TX 78801

Architects: Unknown (For new construction the architects are to be Huckabee, out of Fort Worth, TX)

Date: 1960's (New construction to be started in June of 2023 and completed in October of 2024)

May of 2022, the Robb Elementary School in Uvalde, TX was under attack by a gunman who walked into the school and killed twenty-one people, along with injuring seventeen. The tragedy was noticed all through the nation and discussions about how the local law enforcement reacted became a heated topic in many districts. However, with the inability to change how people reacted, the event scared many students and parents from going back to school.

On Tuesday, June 28th, it was announced that the school will be torn down and rebuilt. News from the district stated that it is unknown what grades will be held at the location but will have "...educational, technological and security enhancements." The projected opening of the school is October 2024, and the design of the building will be donated by Huckabee, an architect firm based out of Fort Worth, TX.

The original building is due to be torn down and replaced with a memorial of the lives that were lost on that day, and the new school will be moved to an intersection that has good access on all sides, which is ideal for bus routes and emergency vehicles to gain access to the location. Similarly, to the original building, the structure will still hold grades 2nd through 4th grade and whereas the original school was able to hold about 550 students, the new school is going to be bigger to be able to encourage the growth of the area.

There is something to be learned about how the tragic event occurred, where there was some sort of miscommunication between what the procedure was from the local law enforcement to what really happened. As

seen in Appendix B and C, the timeline of events was tragic, and the town was unprepared, which can be a revelation to schools all over the nation to see if their enforcements are ready to do as such.

Figures 10 – 13: Interior Photos of the original Robb Elementary School



Figure 08



Figure 09



Figure 10



Figure 11

Case Study C – Sandy Hook Elementary School (Newton, CT)



Figure 14 (Above)

Address: 12 Dickenson Dr, Sandy Hook, CT 06482

Architects: Svigals + Partners

Date: Completed in 2016

December of 2012, Sandy Hook Elementary School was attacked by an armed man who took the lives of twenty-eight students and staff, along with injuring two more. At the time, this news went across the nation, but the town of Sandy Hook is making strides to a bright future, including the new school that was completed in 2016. After the incident, the school was torn down and redesigned and built with safety, particularly from a shooter, in mind.

Even though safety for the students and staff was their main concern, the district still wanted the school to still interact with the students and improve creativity and learning throughout the grades. One thing that is noticed is the number of windows present in the new school, which is not necessarily a terrible thing. Some may argue that windows are less safe compared to a solid wall, but others can argue it is much safer. First, natural sun light is good for the health of students and staff, but with the floor to ceiling windows at the new Sandy Hook Elementary School, it also gives a wide view to the outside, or in some cases, any incoming threats.

Safety for the students and staff does not always have to mean a big piece of expensive security system, but it can be just the simple automatic doors that lock on a schedule, and which can be locked or unlocked electronically. Systems like this keep a point of access to a minimum, especially during school hours. Schools all over the nation are picking up this system and whenever someone wants to enter the building, an administrator

of the school must grant the entry, and usually, the person must go through the primary office before entering the rest of the building.

Even though safety is the number one priority, making a positive learning environment is important as well. That is why the district and the firm worked together to make an interesting interior and exterior to keep kids drawn to the school and in hopes of making it more fun as well. The design plays with simple shapes to make the structure more dynamic and provides more than what meets the eye.

Shown in the exterior and interior photos below, you can see how the schools interact with the students and public to make it more intriguing, but still be efficient and safe as you can see in the floor plan, Appendix D.

Figures 15 – 17: Exterior Photos of Sandy Hook Elementary School



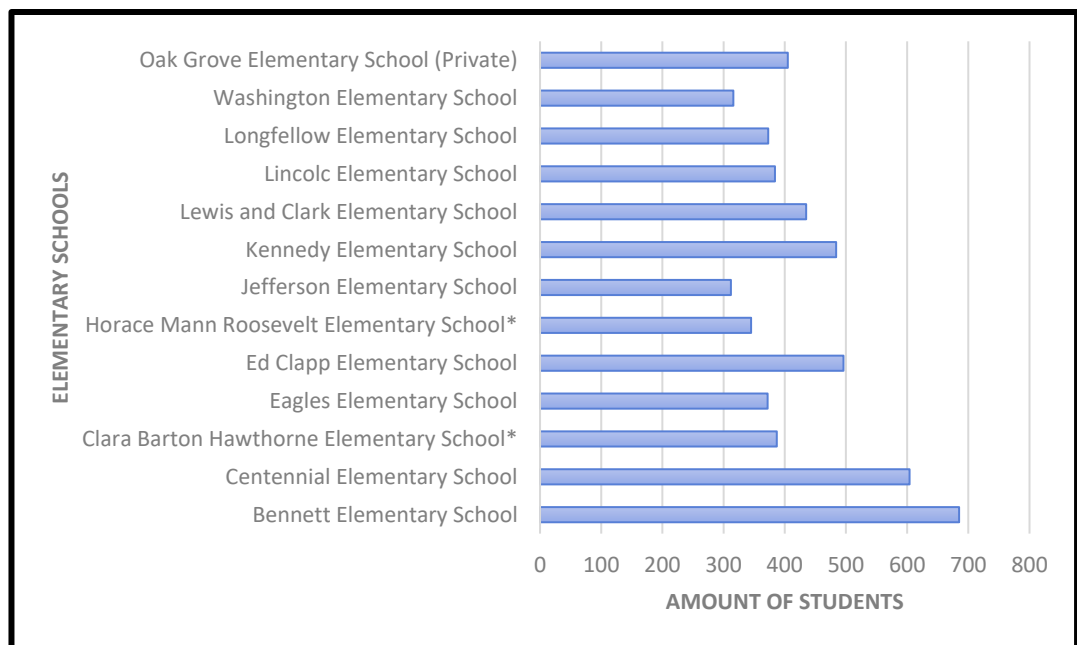
Figures 18 – 21: Interior Photos of Sandy Hook Elementary School



Historical, Social and Cultural Context

In the Fargo Public School District, there are a total of fourteen elementary schools, three middle schools and four high schools. However, Fargo is continuing to grow further south, and Bennett Elementary is prime evidence of such. In the school year of 2021/22, Bennett Elementary had 685 students, whereas the average elementary school size in Fargo was 381 students, ranging from 312 to 685 (Bennett being the largest). The elementary schools that are apart of North Fargo are getting smaller in numbers, making the boundaries grow to keep the student population even throughout the district.

Graph 01: Student Population for Each Elementary School in the Fargo Public School District (2021/22)



*These schools are K – 5th but are split into two separate buildings.

According to Chris Pickney, the liaison between Fargo Public Schools and Valley Bus LLC., the discussion to combine elementary schools in North Fargo to empty and rebuild another, is very plausible. The goal would be to create a bigger school for North Fargo to have accessibility to get the numbers even throughout the district. As shown below, North Fargo has six Elementary schools, and has some of the lowest numbers, however, shown in Figure 28, you can see the possible solution to even the number of students between north side schools and the growing south.

Figure 22: Map of North Fargo's Elementary Schools



Figure 23: North Fargo's Elementary Schools Combination



If a new school, with a bigger capacity, is built and renewed, then more students can be brought to the school and ease the growing numbers of the South Fargo elementary schools. Horace Mann was built in 1915, and hasn't been updated much since, and currently holds grades Kindergarten to first grade, where Roosevelt holds the rest, from second grade to fifth grade. Even though South Fargo is the part that is growing, the need for more schools is due to the size of the first schools built in Fargo, which are the north side schools.

Being part of the older of Fargo, the schools often don't have updated equipment to help keep the students safe. Horace Mann recently updated the entry system in having to 'buzz in' to enter the building during school hours,

but that does not include every entrance. Being built about a century ago, the school simply does not have the size for major remodels inside and needs to utilize the space that it currently has.

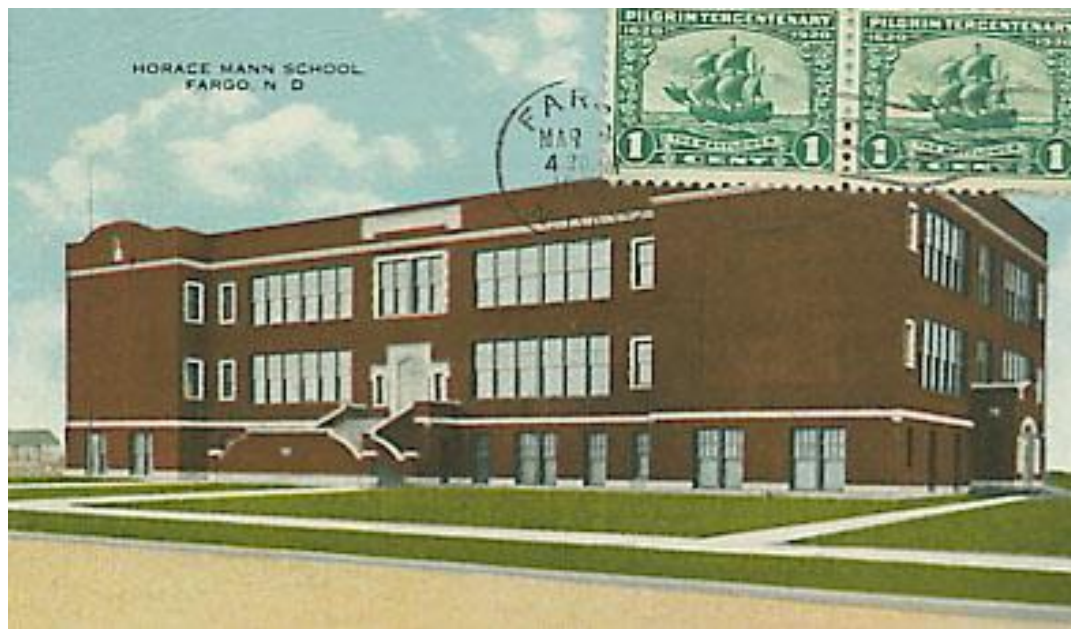


Figure 24 (Above)

Address: 1025 3rd St. N., Fargo, ND 58102

Architects: Unknown

Date: 1915

The current site holds Horace Elementary School that was built in 1915. It currently holds 345 students, Kindergarten through first grade and has about 25,000 square feet of interior space. Shown in Appendix E, the calculated routes to the school and general issues that were faces were corrected or designed around.

As seen in Figures 23 and 24, the site has not changed much from 1999 to 2022. Even though there is an abundance of green space on the current site, the building is not only outdated but does not utilize the space either. The current neighborhood is not very active, mostly just with vehicles driving past, but not a lot of foot traffic, and if a new construction would happen, it could create an inviting atmosphere compared to what it is now.

Figure 25: 1025 3rd St. N, Fargo, ND in the year 1999

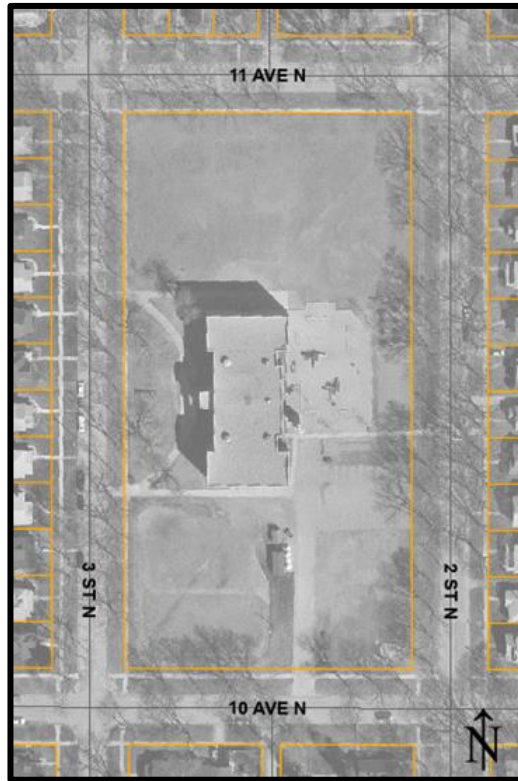
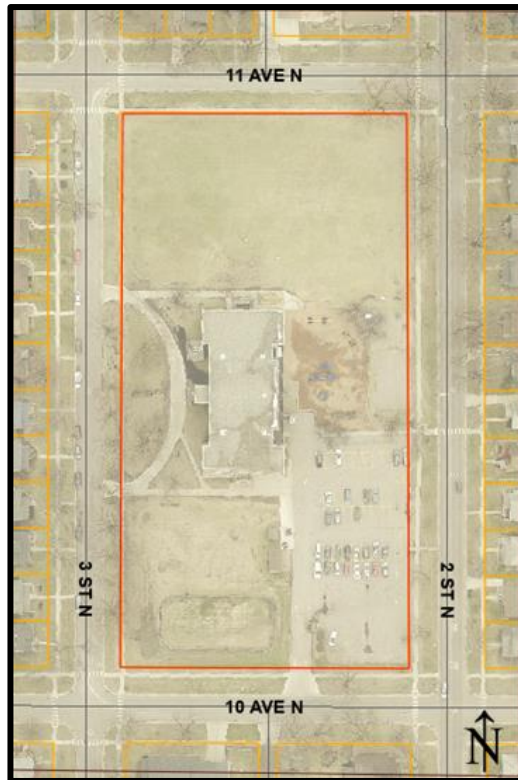
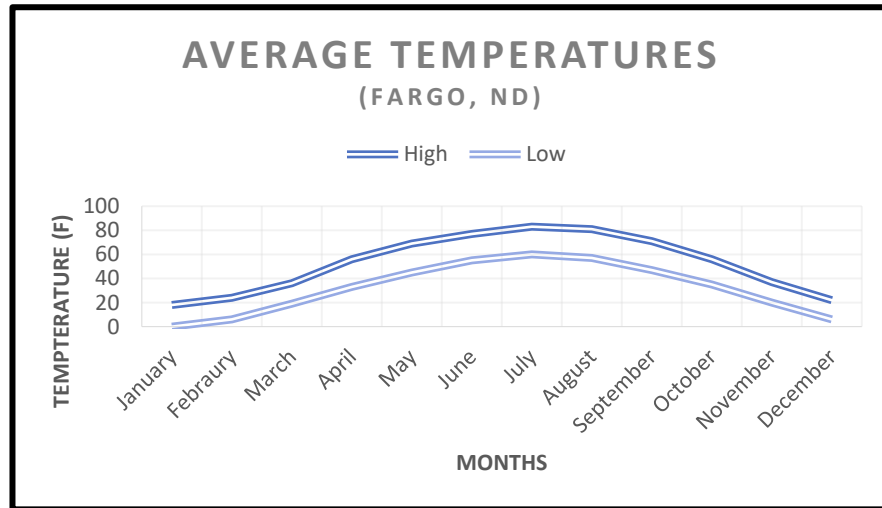


Figure 26: 1025 3rd St. N, Fargo, ND in the year 2022

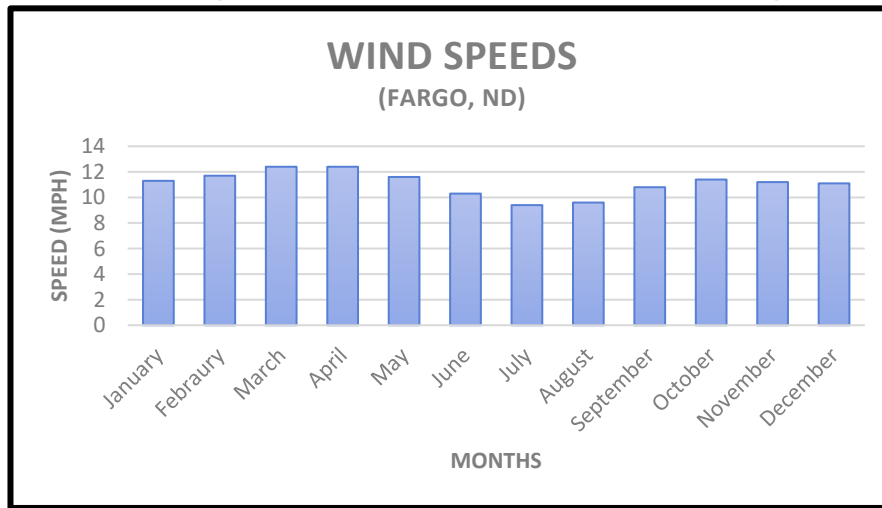


Climate:

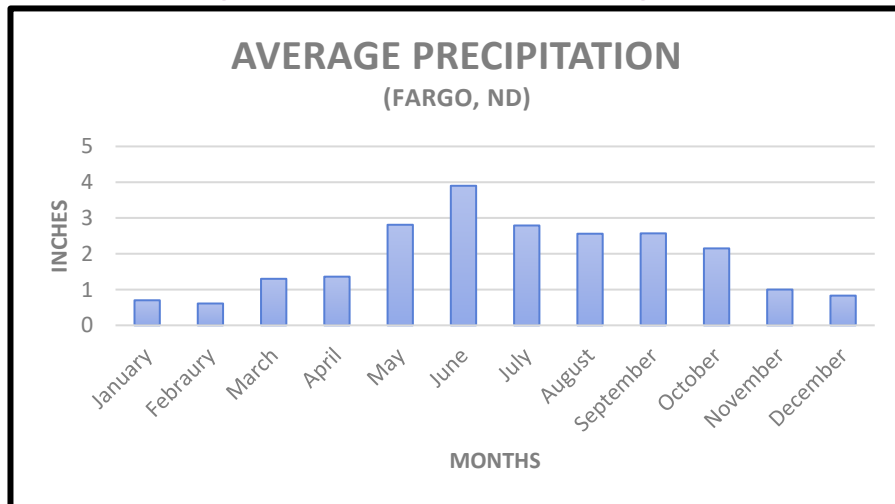
Graph 02: Average Temperatures (Fahrenheit) in Fargo, ND.



Graph 03: Average Wind Speeds (mph) in Fargo, ND.



Graph 04: Average Precipitation in Fargo, ND.



Spatial Program

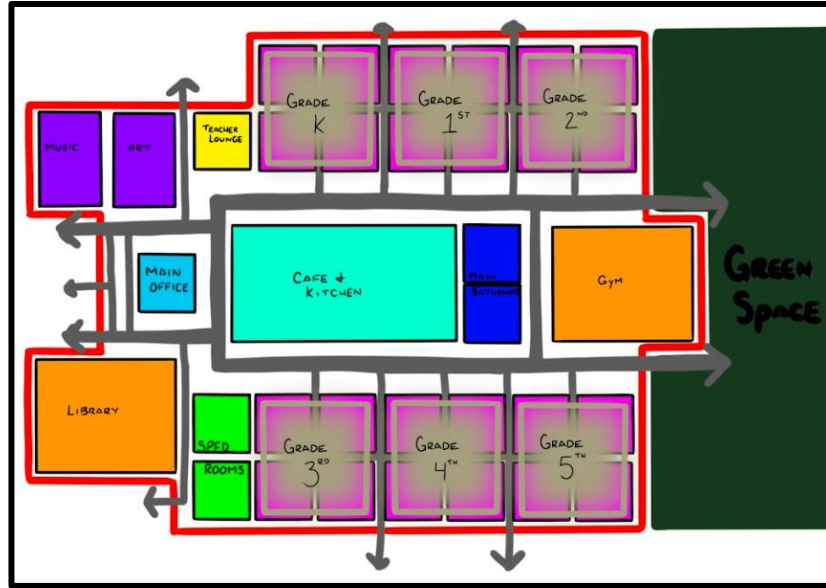
Shown in Table 01 are gross square footages of the average elementary school in North Dakota and the percentage of area that space takes compared to the space that is available.

Table 01: Space Allocation: Elementary School, Fargo ND

Types of Space	GSF (sqft)	Percentage (%)
Pre-K Classrooms (2 total rooms)	2,200	1.29%
Kindergarten Classrooms (4 total rooms)	3,800	2.34%
Grades 1 - 5 Classrooms (4 / grade)	18,000	10.59%
Administration / Offices	10,000	5.88%
Storage / Mechanical	15,000	8.82%
Gymnasium	6,000	3.53%
Library	2,000	1.18%
Cafeteria	2,500	1.47%
Flex Space	2,000	1.18%
Outdoor Space	68,170	40.10%
Parking	20,000	11.76%
Total	149,670	88%
Total SQFT Available		170,000

Below is just one possibility of what the layout could be, just to show how those ratios can fit on the current Horace Mann Elementary School site.

Figure 30: Space Interaction Net Possibility



Space Allocation

As seen in Figure 29, the performance criteria are how efficiently a person, whether it be a student, staff, or a class, can travel through the building with ease and little confusion. It will also be measured of how the layout creates a conducive learning space for students with adequate lighting, space, and visibility. Each source will be measured using AnyLogic and 3D modeling to ensure quality for both students and the staff of the school. The results will be judged as to if all students in a classroom can see the front and/or speaker as well as that each student has enough lighting and are close enough to said front, and if they are, then the performance will be passed.

Behavioral Performance / Usage Patterns

Similarly, to space allocation, behavioral performance will be measured by how efficiently a group of people, both students and adults, travel throughout the school. By using AnyLogic, an average day will be simulated to ensure a clear flow with little to no obstruction through the hallways as well as classrooms and offices. From the simulation, if the floor plan can accommodate the students and staff without getting stuck and/or cluttered, then the performance will be passed.

Psychological Impact

School safety has been a tough subject for years, and with recent events it is getting harder every year for parents to send their children to school without worrying about their safety, both physically and mentally. From research of what has and has not worked in the past with other schools in the nation, the products or layout that increased safety and/or enjoyment from the students will be attempted to be brought into the design. If the design has many research proven items or features that improve the overall safety and/or wellbeing of the students and staff, then the design will pass the performance criteria.

Code Compliance

The entire structure will be within legal standards for the state of North Dakota as well as city of Fargo guidelines. If the finished structure does follow North Dakota structural codes, then the design will pass the performance criteria.

Cost

Fargo Public Schools District has a budget they must stay within when funding a new school and the goal is to stay within said budget. At this time, the district has not commented on what a budget would be or what it could look like. However, if the design stays around that cost, it will pass.

Table 02: Space Allocation of Average Elementary Schools

Types of Space	GSF (sqft)	Percentage (%)	Types of Space	GSF (sqft)	Percentage (%)
<u>Pre-K Classrooms (2 total rooms)</u>	2,200	1.29	<u>Library</u>	2,000	1.18
<u>Kindergarten Classrooms (4 total rooms)</u>	3,800	2.34	<u>Cafeteria</u>	2,500	1.47
<u>Grades 1 - 5 Classrooms (4 / grade)</u>	18,000	10.59	<u>Flex Space</u>	2,000	1.18
<u>Administration / Offices</u>	10,000	5.88	<u>Outdoor Space</u>	68,170	40.10
<u>Storage / Mechanical</u>	5,000	3.58	<u>Parking</u>	20,000	11.76
<u>Gymnasium</u>	6,000	3.53	<u>Total</u>	139,670	88
Total SQFT Available				170,000	N/A

Section C: Design Solutions

Design Solutions

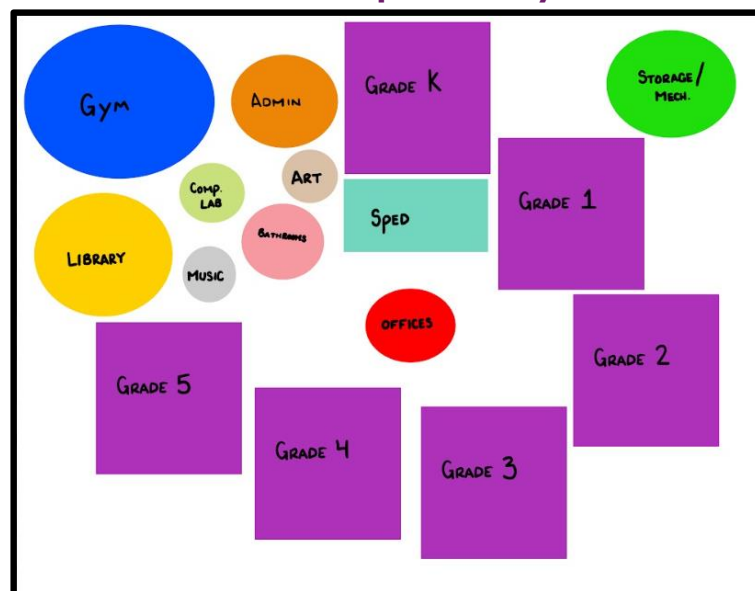
April 21st, 2023

By
Brooke Krutsinger

The process of going through different options of layouts, materials, circulation patterns, was unique due to the limited area the site has, but there were one or two layouts that were not immediately dismissed. The focus of the layout was for circulation to be efficient for day-to-day use, as well as in emergency situations to keep the students and staff safe.

The first step was to lay out everything that was needed and make the shapes roughly the size they would be, proportioned to everything else. The idea was to have the most occupied space, such as the classrooms, closer to the main office, as seen in Figure 30. Originally, the plan was to have the primary office be in the center of the building to have it have easy access to everything and be able to react if needed. However, it was quickly learned that the primary office simply just needed to be near the main entrance, to keep an eye on the perimeter of the school.

Figure 31: Proportioned Needed Space Layout

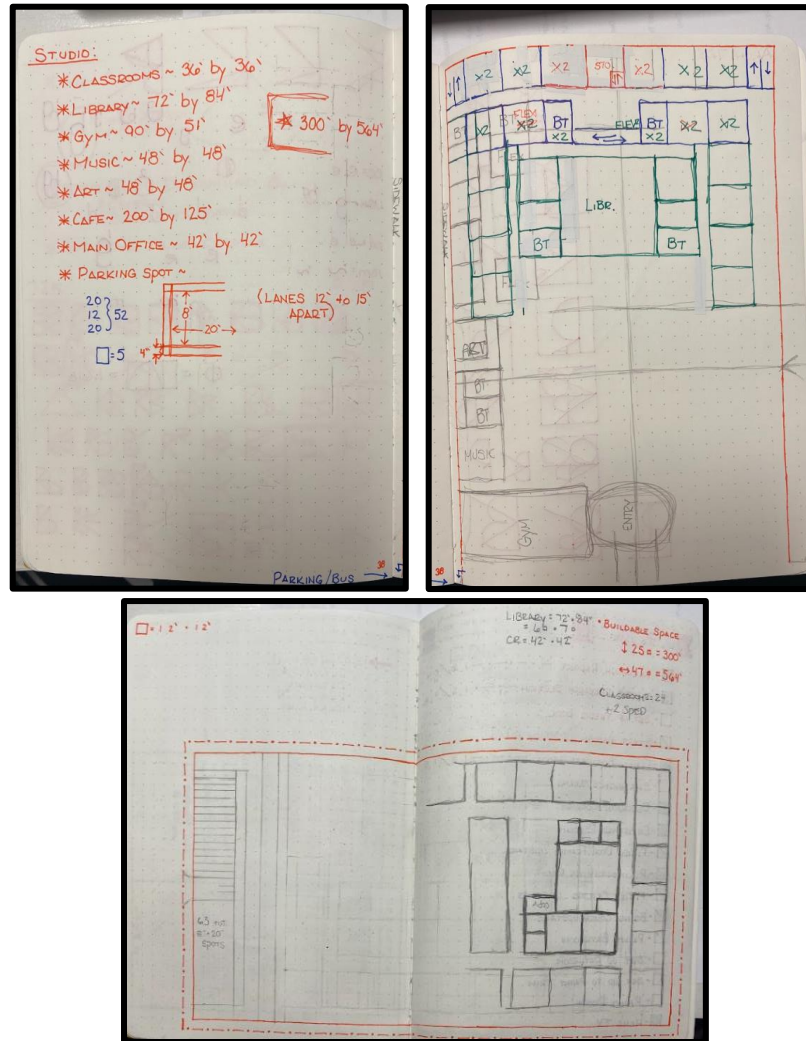


The next idea was to have everything on the ground level, for safety it would be easier for students and staff to evacuate the building in emergency situations. However, the major problem with this was the lack of space on the site. Trying to have everything on ground level resulted in having to squeeze rooms together, making them just the minimum requirements rather than what would be comfortable, and even then, there would still not be a lot of green space available.

That began the process of just piecing everything together to create an effective circulation path for day to day use as well as in emergencies yet

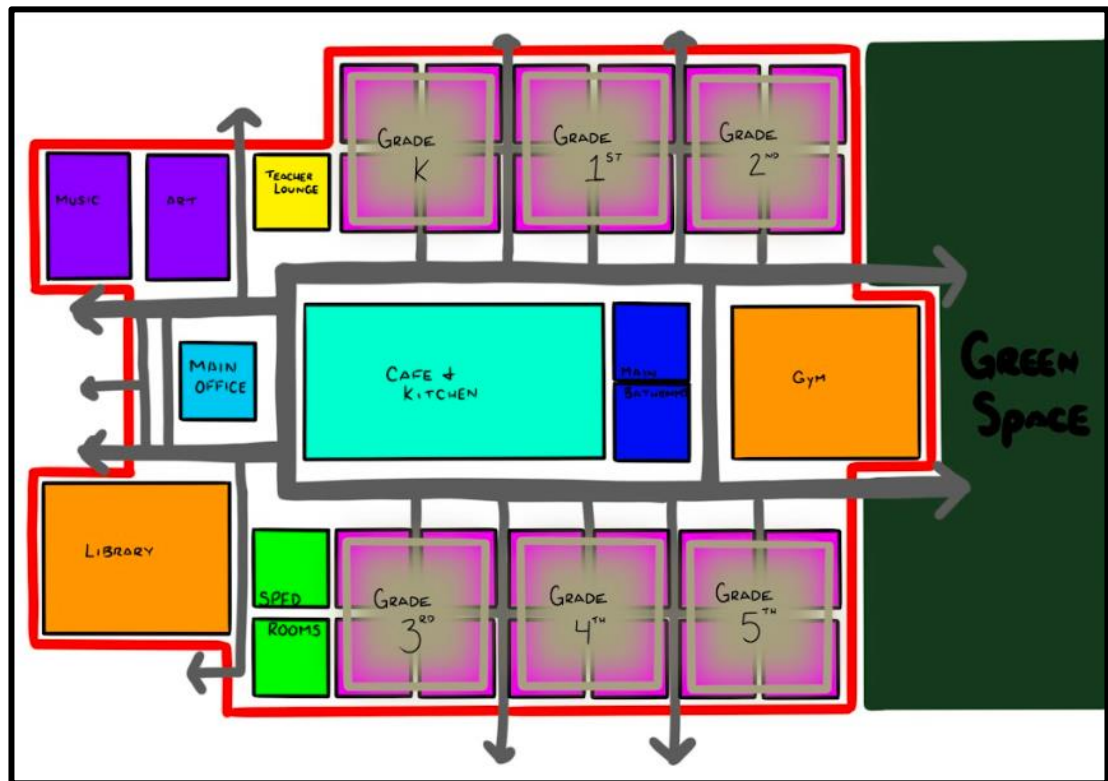
provide enough space for the students to grow and be active. In Figures 31 through 34, the process of elimination, determining dimensions and finding out what can occur on such a small site started.

Figure 32 - 34: Piecing Spaces Together



Shown below in Figure 35, you can see how limited green space would be and the spaces inside the building are scrunched or missing all together. However, a positive characteristic of this design was that there were multiple exits for evacuation purposes, even though there were not many places to hide or seek shelter.

Figure 35: First Official Layout Idea

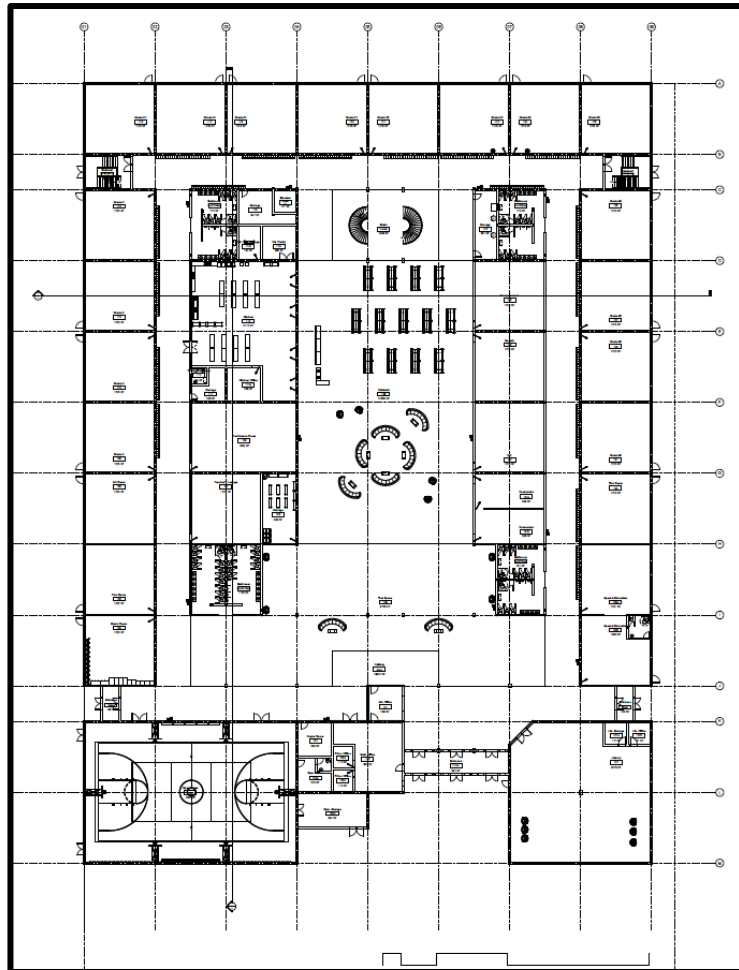


Since this layout didn't have many locations for cover if needed, it was noted that one, storage and mechanical space was missing, and if there were a storm or an intruder, the students could be stuck if they weren't near an exit. This led to the additional focus of adding functioning storage and mechanical spaces for daily use but still could be used for coverage if needed in an emergency.

Project Solution Documentation

From the previous idea, Figure 34, the final solution has some similar aspects, but multiple things were rearranged, resized, added, or taken away. By using Revit, the floor plan of the design solution was made by using a 36' by 36' grid, shown below.

Figure 36: 36' by 36' Grid (Ground Level Shown)



From there, the final layout was tedious to add everything in, such as four classrooms per grade (making a total of twenty-four classrooms), special education classroom (making twenty-six classrooms), a communal area in the center (known now as the Commons), the library, gymnasium and so much more. Table 03 shows the room schedule of the design solution and from there, it shows the size of each room, what level it is on and what the space is for.

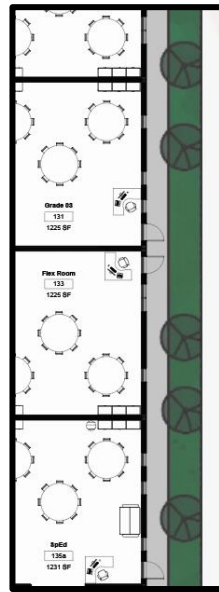
Table 03: Room Schedule

<Room Schedule>				
A	B	C	D	E
Name	Number	Level	Area	Comments
Main Office	100	LEVEL 01	961 SF	Main Office
Princ. Office	100a	LEVEL 01	110 SF	Principle Office
Princ. Office	100b	LEVEL 01	110 SF	Principle Office
Att. Office	101	LEVEL 01	289 SF	Attendance Office
Copier Room	102	LEVEL 01	289 SF	Copier Room
Gymnasium	103	LEVEL 01	7593 SF	Gymnasium
Gym. Office	103a	LEVEL 01	225 SF	Gymnasium Office
Gym. Storage	103b	LEVEL 01	594 SF	Gymnasium Storage
Music Room	104	LEVEL 01	1225 SF	Music Room
Flex Room	105	LEVEL 01	1225 SF	Flex Room
Art Room	106	LEVEL 01	1225 SF	Art Room
Teacher's Lounge	107	LEVEL 01	1224 SF	Teacher's Lounge
Grade K	108	LEVEL 01	1225 SF	Grade K
Conference Room	109	LEVEL 01	1853 SF	Conference Room
Grade K	110	LEVEL 01	1225 SF	Grade K
Storage	111	LEVEL 01	208 SF	Storage
Private Bathroom	112	LEVEL 01	64 SF	Teacher's Bathroom
Grade K	113	LEVEL 01	1225 SF	Grade K
Kitchen	114	LEVEL 01	3112 SF	Kitchen
Kitchen Office	114a	LEVEL 01	289 SF	Kitchen Office
Kit. Cold Storage	114b	LEVEL 01	187 SF	Kitchen Cold Storage
Kit. Pantry	114c	LEVEL 01	289 SF	Kitchen Pantry
Grade K	115	LEVEL 01	1225 SF	Grade K
Grade 01	116	LEVEL 01	1225 SF	Grade 01
Grade 01	117	LEVEL 01	1225 SF	Grade 01
Grade 01	118	LEVEL 01	1225 SF	Grade 01
Storage	119	LEVEL 01	347 SF	Storage
Grade 01	120	LEVEL 01	1225 SF	Grade 01
Grade 02	121	LEVEL 01	1225 SF	Grade 02
Grade 02	122	LEVEL 01	1225 SF	Grade 02
Storage	123	LEVEL 01	381 SF	Storage
Grade 02	124	LEVEL 01	1225 SF	Grade 02
Grade 02	125	LEVEL 01	1225 SF	Grade 02
Grade 03	126	LEVEL 01	1225 SF	Grade 03
Grade 03	127	LEVEL 01	1225 SF	Grade 03
Computer Lab	128	LEVEL 01	1225 SF	Computer Lab

<Room Schedule>				
A	B	C	D	E
Name	Number	Level	Area	Comments
Grade 03	127	LEVEL 01	1225 SF	Grade 03
Computer Lab	128	LEVEL 01	1225 SF	Computer Lab
Grade 03	129	LEVEL 01	1225 SF	Grade 03
Speech	130	LEVEL 01	1225 SF	Speech
Grade 03	131	LEVEL 01	1225 SF	Grade 03
ILC	132	LEVEL 01	1225 SF	ILC
Flex Room	133	LEVEL 01	1225 SF	Flex Room
Counselors	134a	LEVEL 01	595 SF	Counselors
Special Education	135a	LEVEL 01	1231 SF	Special Education
Special Education	135b	LEVEL 01	1086 SF	Special Education
Storage	136	LEVEL 01	595 SF	Storage
Library	137	LEVEL 01	4678 SF	Library
Lib. Storage	137a	LEVEL 01	121 SF	Library Storage
Lib. Office	137b	LEVEL 01	121 SF	Library Office
Entrance	Front	LEVEL 01	582 SF	Main Entrance
Entrance	East	LEVEL 01	136 SF	East Side Entrance
Entrance	West	LEVEL 01	136 SF	West Side Entrance
Stairs	Center	LEVEL 01	1938 SF	Main Stairs
Stairwell	Emergency West	LEVEL 01	391 SF	Fire Stairwell West
Stairwell	Emergency East	LEVEL 01	391 SF	Fire Stairwell East
Cafeteria	138	LEVEL 01	12809 SF	Cafeteria
Flex Space	139	LEVEL 01	9709 SF	Flex Space
Hallway	Main	LEVEL 01	19824 SF	Hallways
Elevator	Level 01	LEVEL 01	121 SF	First Floor Access
Bathroom	SouthWest	LEVEL 01	1182 SF	Men and Women's Bathroom
Bathroom	SouthEast	LEVEL 01	791 SF	Men and Women's Bathroom
Bathroom	NorthEast	LEVEL 01	775 SF	Men and Women's Bathroom
Bathroom	NorthWest	LEVEL 01	775 SF	Men and Women's Bathroom
Grade 04	200	LEVEL 02	1225 SF	Grade 04
Grade 04	201	LEVEL 02	1225 SF	Grade 04
Teacher's Lounge	202	LEVEL 02	493 SF	Teacher's Lounge
Storage	203	LEVEL 02	348 SF	Storage
Flex Room	204	LEVEL 02	1225 SF	Flex Room
Grade 04	205	LEVEL 02	1225 SF	Grade 04
Grade 04	206	LEVEL 02	1225 SF	Grade 04
Grade 05	207	LEVEL 02	1225 SF	Grade 05
Grade 05	208	LEVEL 02	1225 SF	Grade 05
Grade 05	209	LEVEL 02	1225 SF	Grade 05
Grade 05	210	LEVEL 02	1225 SF	Grade 05
Flex Room	211	LEVEL 02	1225 SF	Flex Room
Storage	212	LEVEL 02	382 SF	Storage
Bathroom	02 NE	LEVEL 02	777 SF	Men and Women's Bathroom
Bathroom	02 NW	LEVEL 02	776 SF	Men and Women's Bathroom
Elevator	Level 02	LEVEL 02	121 SF	Second Floor Access
Counselors	134b	LEVEL 01	595 SF	Counselors

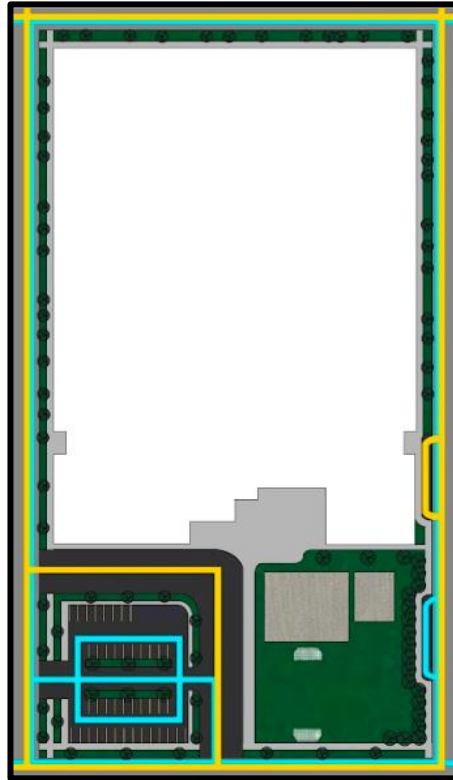
After the rooms were planned, material, steel framed, and window placement was next. The windows had two main aspects on where the placement was, first, they were to have minimal, if any, ability to see from the outside in, but still have a decent to clear visibility going outwards, and second, placed to have adequate sunlight, meaning not having them blocked by shelves on the inside or vegetation on the outside. Shown below is an example of a classroom's window placement, and it is seen that the windows are in a pattern with the trees to allow more vegetation without blocking the natural light.

Figure 37: Window Placement Patterns



Since greenery was important in this project, along with safety, trees were used not only as wind blocking, but as privacy as well. Trees gave the site a variety of colors and growth that encourages movement throughout the site but also helps with the changes in the climate, such as wind and snow. Going along with greenery, the development for vehicular had the goal to keep school buses and parents separate for the drop off and pick up of students. This creates a safe place for students that is not too congested with so many vehicles in one place, as well as helping effectively get the school buses and parents in and out to go on with their day. Shown in Figure 32, school buses and vehicles share the road on a daily basis, but it's clear that school buses have a certain lane of dropping off as do parents and other vehicles.

Figure 38: Bus and Vehicular Circulation

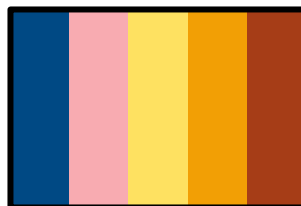


Teal represents parents and vehicular traffic, and the yellow represents bus traffic.
(The white is the building's footprint)

Next was deciding the roof structure so that the rain and snow would drain rather than pool up causing damage. Making it curved prevents buildup of precipitation and gives the school a type of 'book ends' to make it interesting to look at and to give the sense of strength to the viewers.

Deciding on a color palette was strangely difficult due to not wanting it to be boring, but not too exciting to distract students, and not too dull to make the students too relaxed to pay attention in class. From the case studies, specifically Sandy Hook Elementary School, a mixture of mostly warm colors was decided to make it a fun environment but not too distracting.

Figure 39: Color Palette



Since safety was a main component for this design, a lot of exterior doors were needed for fast evacuation, if necessary, but still not allowing people into the building whenever they please. That resulted in exit only, or emergency doors, being in every room on the exterior wall of the structure.

This allows easy evacuation, but no reentry unless someone from the inside opens it to let them in.

Figure 40: Main Doors (Only Entrances)

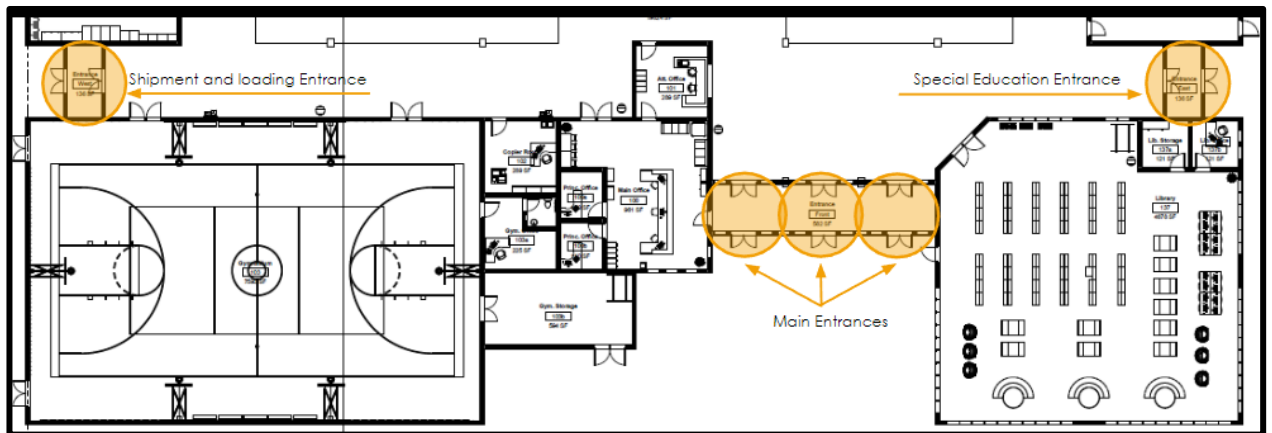
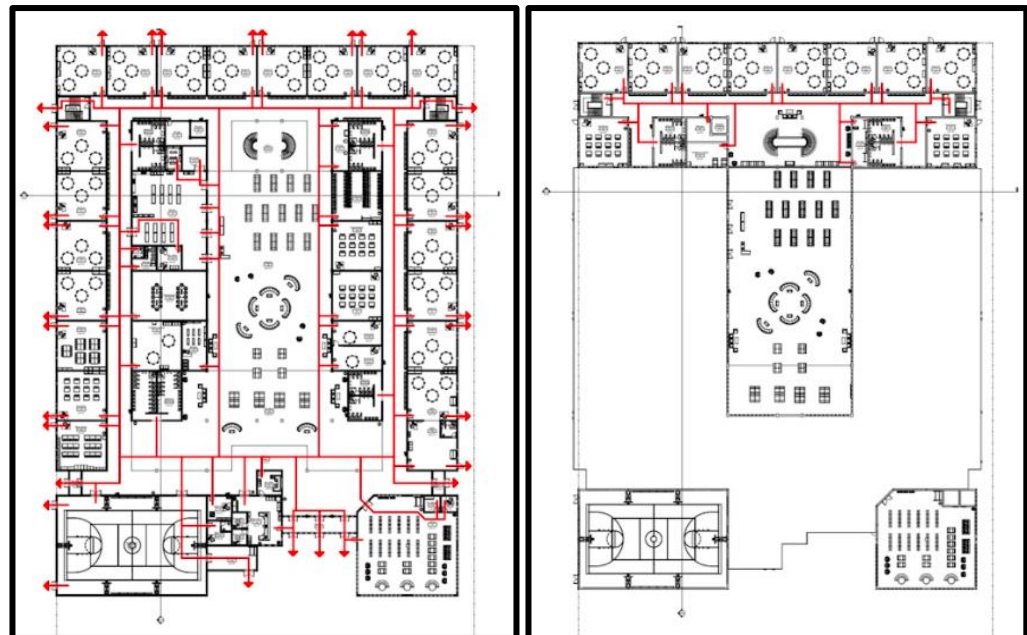
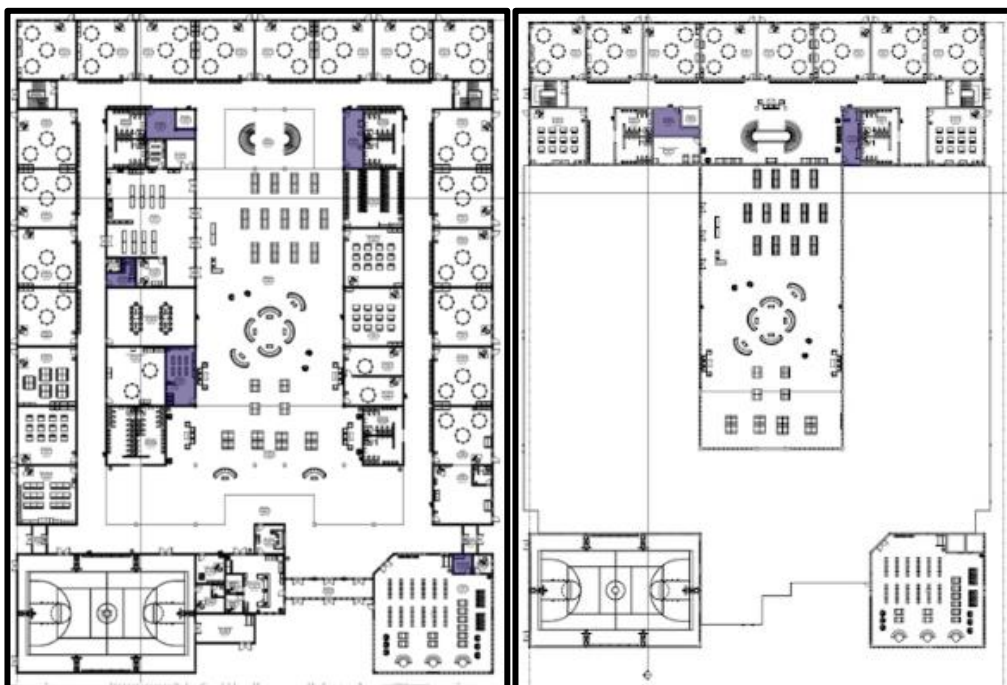


Figure 41: Emergency Routes and Exits on Ground Level (Left) and Upper Level (Right)



In addition to multiple emergency exits, if there was a class walking in the hallway when an intruder entered the building, storage / mechanical rooms were spread throughout the school for quick cover. Shown in Figure 41, the different locations that are used for storage and mechanical space daily but could be used for hiding, or taking cover, in an instance where there was an intruder, or a storm.

Figure 42: Storage / Mechanical Rooms (shown in blue) on the Ground Level (Left) and the Upper-Level (Right).



Performance Analysis and Criteria Evaluation

Space Allocation

Shown in Table 02, it is seen that most of the designs spaces either exceed or meet the North Dakota average for gross square footage percentage, except for the following spaces: administration / offices, storage / mechanical, outdoor space. The reasons for a smaller ratio for administration spaces and storage space is due to some sharing space with other things, for example, some storage and mechanical space are with gym storage, and some offices are shared with larger rooms, such as the gym, library, or kitchen. Since the site itself was a constraint, it was known that green space was going to be slightly limited, as seen by the ratio, but to counter that issue, a green roof was added. Another reason these three percentages were lower could be due to the amount of flex space that is available, which can remotely be used for any activity.

Table 04: Space Allocation Comparison of Average Elementary Schools and the Design Solution

Types of Space	GSF (sqft)	Percentage (%)	Design Solution GSF (sqft)*	Design Solution (%)
Pre-K Classrooms (2 total rooms)	2,200	1.29	N/A	N/A
Kindergarten Classrooms (4 total rooms)	3,800	2.34	4,900 (1,225 / Classroom)	2.90
Grades 1 - 5 Classrooms (4 / grade)	18,000	10.59	24,500 (1,225 / Classroom)	14.48
Administration / Offices	10,000	5.88	6,806	4.02
Storage / Mechanical	5,000	3.58	3,909	2.31
Gymnasium	6,000	3.53	7,593	4.49
Library	2,000	1.18	4,678	2.76
Cafeteria	2,500	1.47	12,809	7.57
Flex Space	2,000	1.18	9,709	5.74
Outdoor Space	68,170	40.10	45,460	26.87
Parking	20,000	11.76	22,000	13.00
Total	139,670	88	142,364	84.14
Total SQFT Available	170,000	N/A	169,200	N/A
*There are two levels included in the square footage, the main floor and the second level.				

The other part of the criteria was the layout of the classroom which encourages open discussion, yet still provides easy access to see the front of the room. As seen in Figure 43, the round tables provide easily formed groups for activities, and they are staggered to provide space for everyone to see the board. Overall, the design does pass the space allocation criteria when all spaces are considered, and as a result, students have more space to grow, discuss topics with their peers, and see the teacher in front of the classroom with ease.

Figure 43: Average Classroom Layout

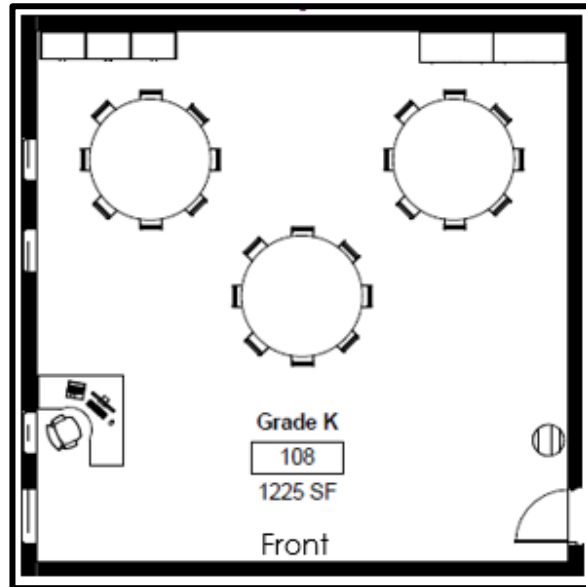
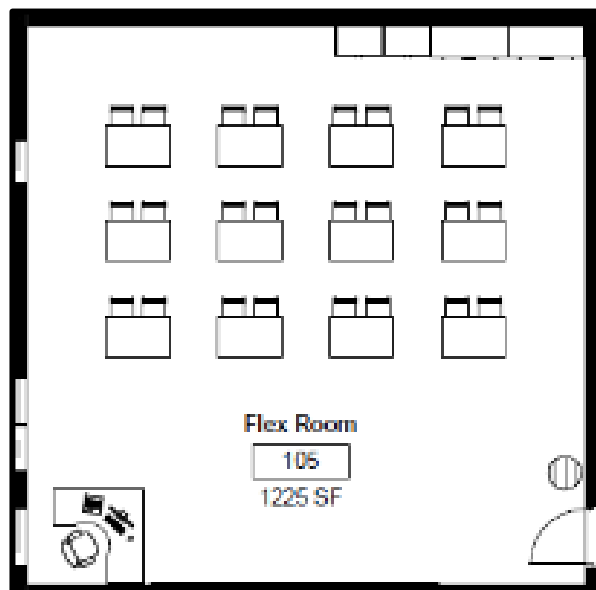


Figure 44: Other Classroom Layout (Flex Space)



Behavioral Performance / Usage Patterns

Since the design focus was for the circulation to be easy for students and staff to travel throughout the building and exit quickly if needed, the proposal passes the criteria. As shown in Figure 45 and 46, you can see all the possible exits, shown by arrows, as well as the main routes to travel throughout the school.

Figure 45: Ground Level Circulation Paths

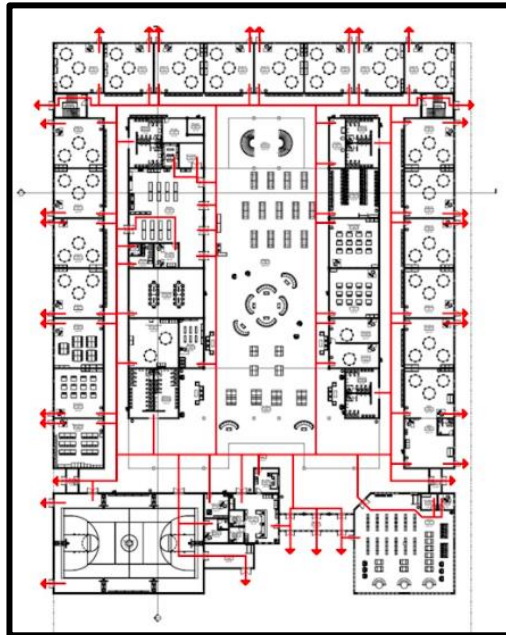
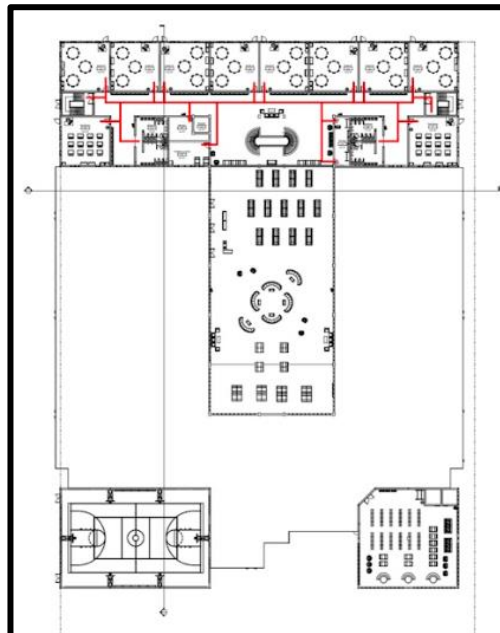


Figure 46: Upper-Level Circulation Paths



Psychological Impact

The design solution has many things to provide safety for those inside the building, such as door sensors, cameras, minimum entry to the building, metal detectors and more. These items provide physical safety, or safety reassurance, however, noticeable metal detectors for example, can give off a weary presence. This design focuses on the physical safety of students and staff, where these preventative steps can bring comfort to some, it can also make some feel uneasy about the need for these precautions. This design, with its cameras and open layout, can cut down on in person bullying, however that does not include cyber bullying, which can occur as, or more, often as in person. On one side of the design, it passes the criteria of giving students the sense of safety inside the school and can cut down on some bullying, however, one can argue that it can make the kids more nervous to attend school due to these precautions, and that it doesn't help on the virtual front of bullying.

Code Compliance

The entire structure is within the legal standards of the State of North Dakota as well as the City of Fargo guidelines, the design passes these criteria.

Note: Figure 47 through 75 are the slides of the final presentation PowerPoint, and Figure 76 is of the presentation board.

Horace Mann Elementary School *modernized*

- The Goal
- The Reason
- The Audience
- The Site and Research
- The Proposal

Figure 47

The Goal

To create a **safe** place for students to grow, build positive relationships and to start their educational career off strong.

To design a floor plan that doesn't only accommodate the students but accommodates the staff, the public, and local law enforcement to maintain a positive effect on the community, as well as keep everyone safe.

Figure 48

The Reason

A school's safety has been a hot topic for the nation for decades, and each year, the amount of school shootings keep increasing year after year.

No student deserves to be scared for their safety when at school, and parents shouldn't be worried about their safety either.

Some schools were built so long ago that the classroom styles are out of date and may not be an effective learning space for the students of today.

Figure 49

The Reason

Kids today are the future; they shouldn't have to worry about being physically attacked at school. Their full-time jobs are to do homework, study for tests, and to simply grow up.

From being a bus driver, I have heard and seen kids share what they think of school many times, and more often this year. I have been asked if they could stay on the bus with me longer.

Figure 50

The Audience

Fargo Public School District (FPS) of North Dakota, which makes the budget and sets the requirements for the overall structure.

However, students, the staff, the community and the local law enforcement were also considered in the design of the interactive building...

Figure 51

The Community

Figure 52

The Site

1025 3rd St. N. Fargo, ND 58102

Part of North Fargo, the buildable space is 564' by 300' and has the current Horace Mann Elementary School.

Figure 53

The Site

The current Horace Mann Elementary School was built in 1915 and since then, the only remodeling that has occurred, was simply the basic upkeep of such an old building.

The school now only holds Kindergarten through second grade due to the lack of space. Roosevelt Elementary is its partner and takes the third through fifth graders.

Figure 54

The Site

- LOI
- Vehicular Traffic
- Pedestrian Traffic
- Controlled Crosswalk
- Building Footprint
- Greenery
- Parking / Bus Pick Up and Drop Off

FUN FACT

Figure 55

The Research

Safety for the students and staff doesn't always have to mean a big piece of expensive security system, but it can be just the simple automatic doors that lock on a schedule, and which can be locked or unlocked electronically. Systems like this keep a point of access to a minimum, especially during school hours.

Figure 56



Figure 57

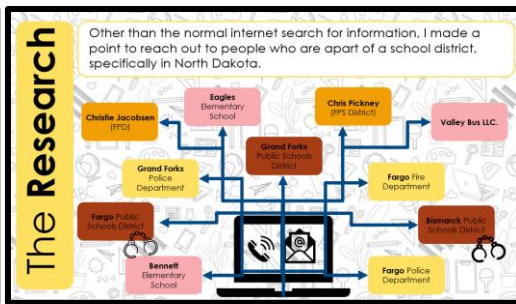


Figure 58



Figure 59

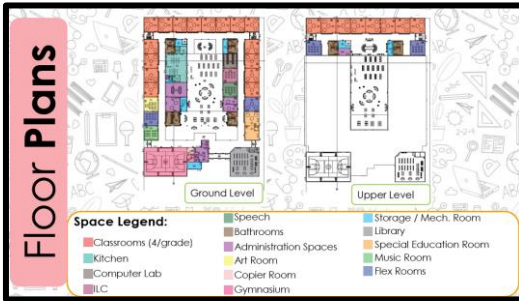
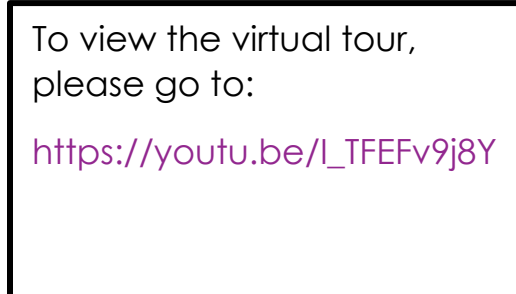


Figure 60



Figure 61

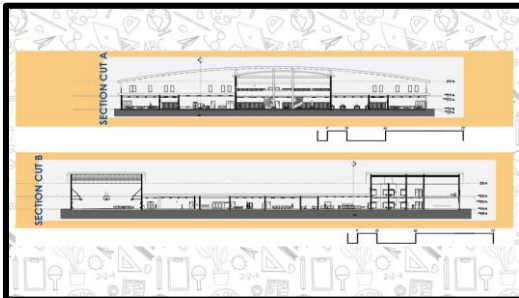


Figure 62



Figure 61



Figure 64

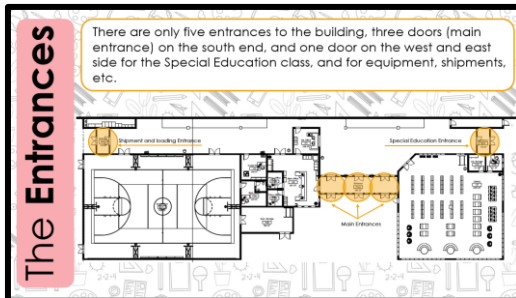


Figure 65

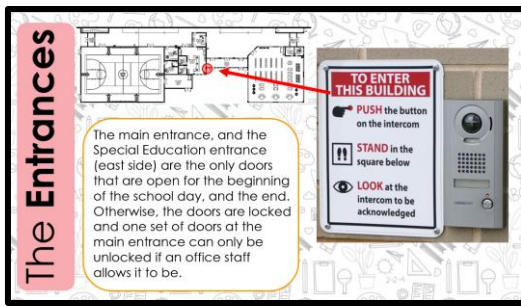


Figure 66

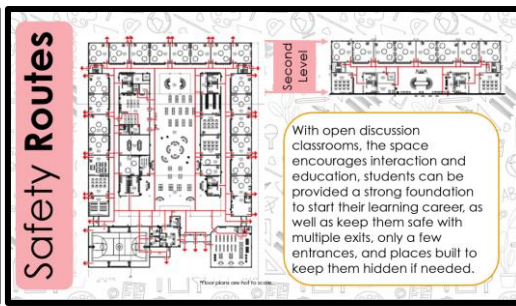


Figure 67

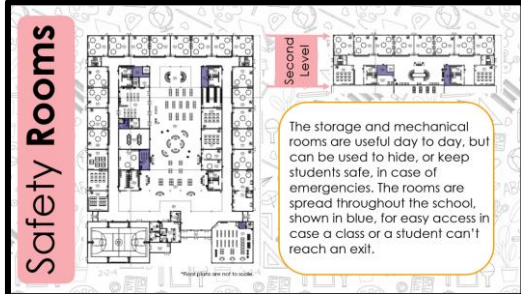


Figure 68



Figure 69

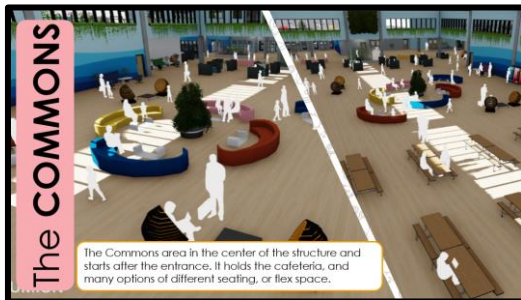


Figure 70

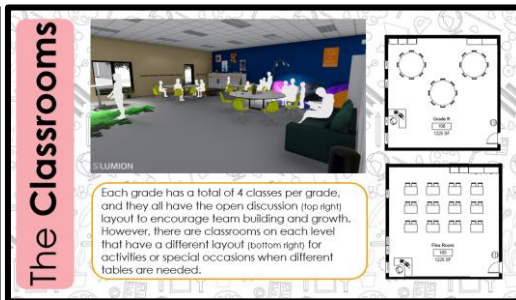


Figure 71



Figure 72



Figure 73

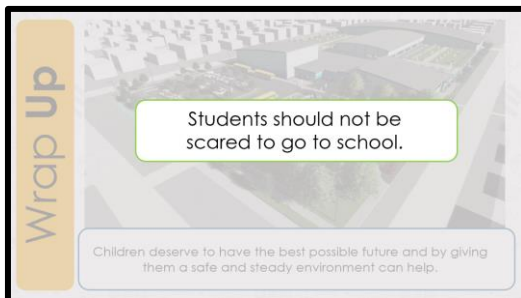


Figure 74

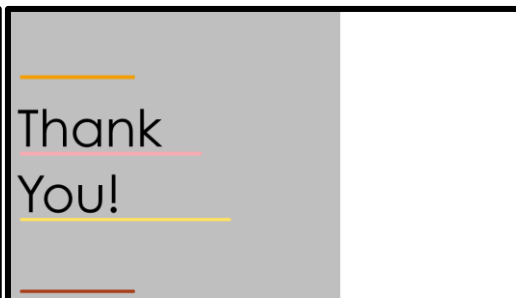


Figure 75

Figure 76: Final Board Presentation

HORACE MANN ELEMENTARY SCHOOL *modernized*

- Lot
- Vehicular Traffic
- Pedestrian Traffic
- Controlled Crosswalk
- Building Footprint
- Greenery
- Parking / Bus Pick Up and Drop Off



School safety has been a hot topic for the nation for decades, and the school environment seems to be getting more and more dangerous every year. This causes parents to feel the need to keep their students' home to keep them safe, which can hinder different aspects of a child's life. However, can a floor plan and certain materials be used in schools to interact with the students, staff and local forces, to increase safety while still creating an effective learning environment? With the use of different software and the help of multiple school districts and local police departments, a school can be designed to help keep students and staff safe during an emergency while still being a productive environment for growth.

As Fargo grows, schools that may have been built over a century ago just can't hold enough students to accommodate the growth, resulting in getting overcrowded. From corresponding with the Fargo Public School district, it was learned that the idea of tearing down the current Horace Mann Elementary School in North Fargo, and rebuilding a school that can hold grades K - 5th was proposed. If so, an integrated building can be built to not only give students the best chance to have a bright future, but to give them the safety that they all deserve no matter what the emergency might be.

"Students achieving skills for a lifetime of learning."
 -Horace Mann Elementary School
 (Inclusive statement)



A variety of indoor and outdoor spaces full of greenery and natural sun light.



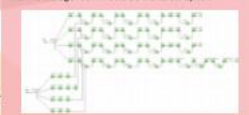
With open discussion classrooms, the space encourages interaction and education, students can be provided a strong foundation to start their learning career, as well as keep them safe with multiple exits, only a few entrances, and places built to keep them hidden if needed.

Shown to the right, are all of the exterior doors but only five of them are able to be used to enter the building and can be opened during certain hours only. When students are being dropped off and being picked up, those five doors are unlocked. The rest of the day, they are locked and can only be opened if someone from the office allows it.

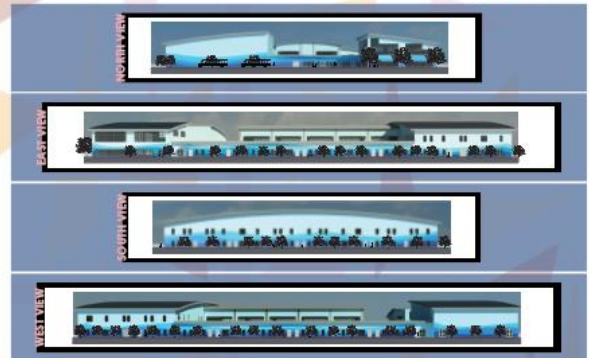


With the use of AnyLogic, it can be seen how a class could take shelter in a room to stay safe. The storage and mechanical rooms are useful day to day, but can be used to hide, or keep students safe, in case of emergencies. The rooms are spread throughout the school, shown in blue above, for easy access in case a class or a student can't reach an exit.

The AnyLogic screenshot shown below, are just the 1st grades of the simulation. The classes are made up of 18-20 students, one teacher and one paraprofessional. At first, the simulation starts as a normal day but then the alert over the intercoms, and security system, warns the classes showing how three of the four evacuates immediately from their classrooms, whereas the last class was in the hallway when they were notified, making them decide that the storage room would be the safest option.



"Education and Empowering All Students To Succeed"
 - Fargo Public Schools



TYPE OF SPACE	NO. OF SPACES	NO. AVERAGE	Design Volume
		sqft (sqm)	sqft (sqm)
Classroom / Classroom	3,000	1,200 / Classroom	3,600,000
Classroom / Classroom	1,000	1,200 / Classroom	1,200,000
Administrative Offices	4,000		4,000
Storage / Mechanical Room	8,000		8,000
Classroom	4,000		4,000
Library	2,000		2,000
Cafeteria	2,000		2,000
Non-Space	2,000		2,000
Outdoor Space	40,116		40,116
Parking	20,000		21,600
Other	185,876		141,744
Total (sqft Available)	150,000		149,200





Figure 77

Figure 78: Floor Plans

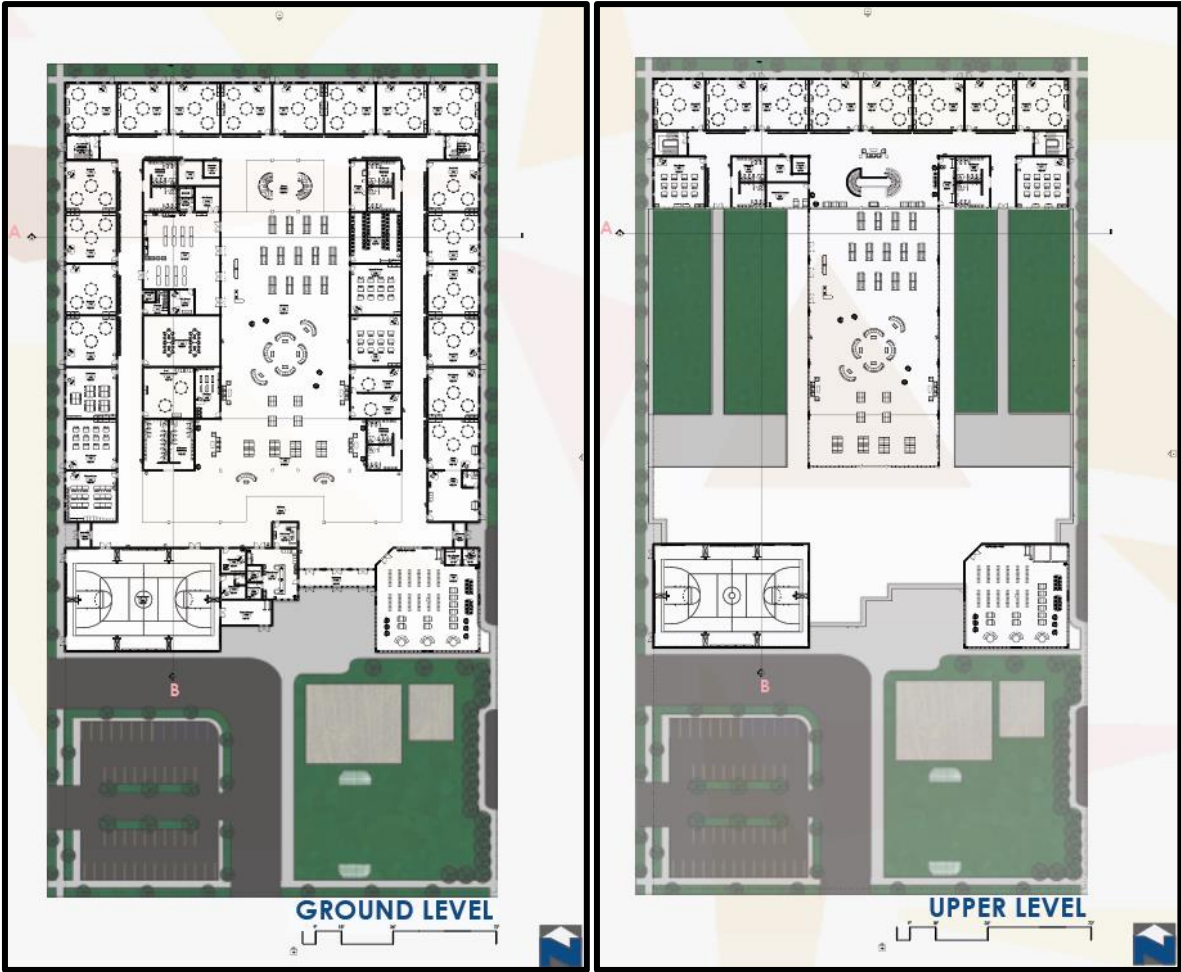


Figure 79: Section Cut A (Top) and Section Cut B (Bottom)

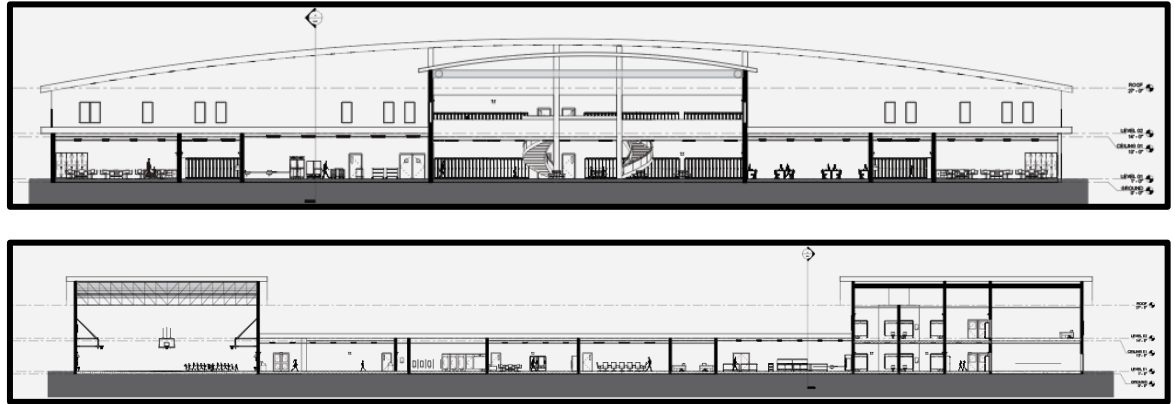


Figure 80: North View

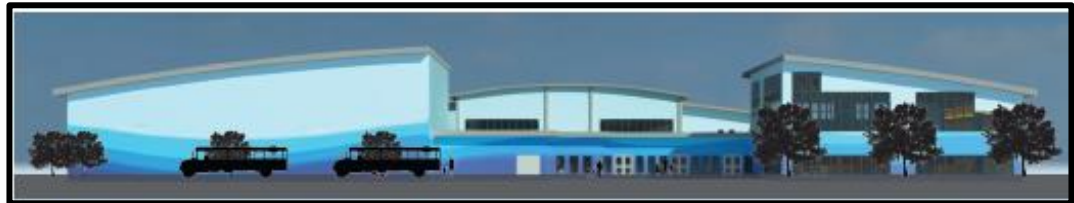


Figure 81: East View



Figure 82: South View

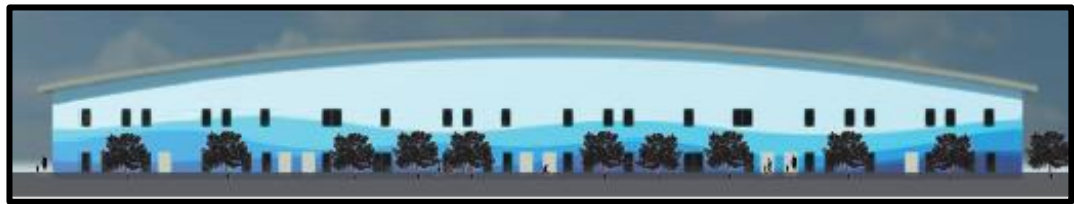


Figure 83: West View



Figure 84 - 93: Rendered Photos



Average Classroom



Art Room



Music Room



Library



East Green Roof



Playground



Southwest Corner View



the Commons



the Commons



Bird's Eye View of the Site

Section D: Appendix, Resources and Past Experiences

Bibliography

May 10th, 2023

By

Brooke Krutsinger

Appendix A – Bennett Elementary Circulation

Bennett Elementary

Bennett Elementary
 2000 58th Avenue S., Fargo, ND 58104

DISTRICT
 Fargo Public School District #1

GRADES
 K-5

AVERAGE ENROLLMENT
 536

ARRIVAL
 8:20 a.m.

DISMISSAL
 2:42 p.m.

FARGO SAFE ROUTES TO SCHOOL PLAN



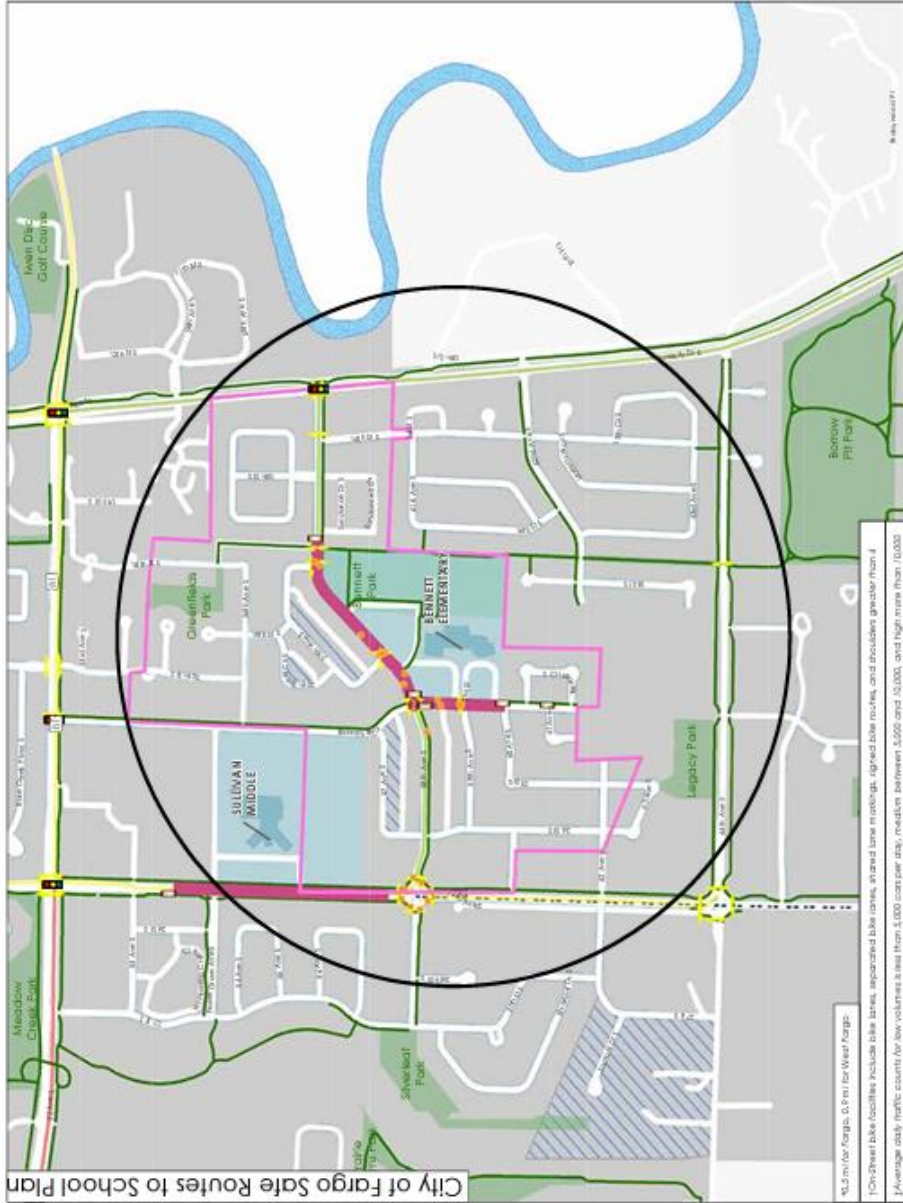
Existing Conditions

Bennett Elementary is a kindergarten through 5th grade school in the Fargo Public School District. It is located approximately six miles south of Downtown Fargo in the city's Bennett neighborhood. The neighborhood consists primarily of residential single-family homes. Within the Bennett boundaries, per capita income and household income are much higher than the district average. Seventeen percent of Bennett students are eligible for free and reduced lunch programs. Around three percent of student's participate in English Language Learners programs.

The Bennett school facility was constructed in 2000. The campus is bound by 21st Street S to the west, 58th Avenue S to the north, approximately 16th Street S and Sundance Square S to the east, and 60th Avenue S to the south. The surrounding roads are generally low traffic roadways serving the residential developments. However, some speeding was observed during the field review. School speed zones are designated along 58th Avenue S from Bishops Boulevard / 21st Street S to east of Bennett Park, and along 21st Street S from 58th Avenue S to 60th Avenue S. Within the walk zone, there are some sidewalk gaps, mostly associated with undeveloped parcels.



▲ Along 58th Avenue, speed is observed to be an issue. There are many unprotected crosswalks along this segment.



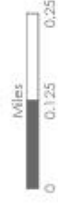
400 ft for Fargo, 60 ft for West Fargo.

[On-Street bike facilities include bike lanes, separated bike lanes, shared lane markings, signed bike routes, and boulevard bicycle routes.]

[Average daily traffic counts for low volumes are less than 5,000 cars per day, medium between 5,000 and 10,000, and high more than 10,000.]

Existing Conditions
Bennett Elementary

- School Study Areas*
 - Walk Zones
 - Building Footprints
 - School Grounds
 - Park
 - Environmental Justice Areas
 - School Speed Zone
 - Shared Use Path
 - On-Street Bike Facility†
 - Sidewalk
 - Curbwalk
 - Pedestrian Crossing Sign
 - 4-Way Stop Sign
 - HAWK Signal
 - Other Flashing Sign
 - Signalized Intersection
- Traffic Volume‡**
- Low
 - Medium
 - High



METROCOG

Circulation Challenges

58th Avenue S, north of the campus, is perceived by caregivers as a barrier to walking and biking. There are sidewalk gaps, observed high speed traffic, and poor yielding compliance. The field review indicated the intersection with 20th Street S has low pedestrian visibility. Drivers along the corridor do not expect to see pedestrians crossing at this location.

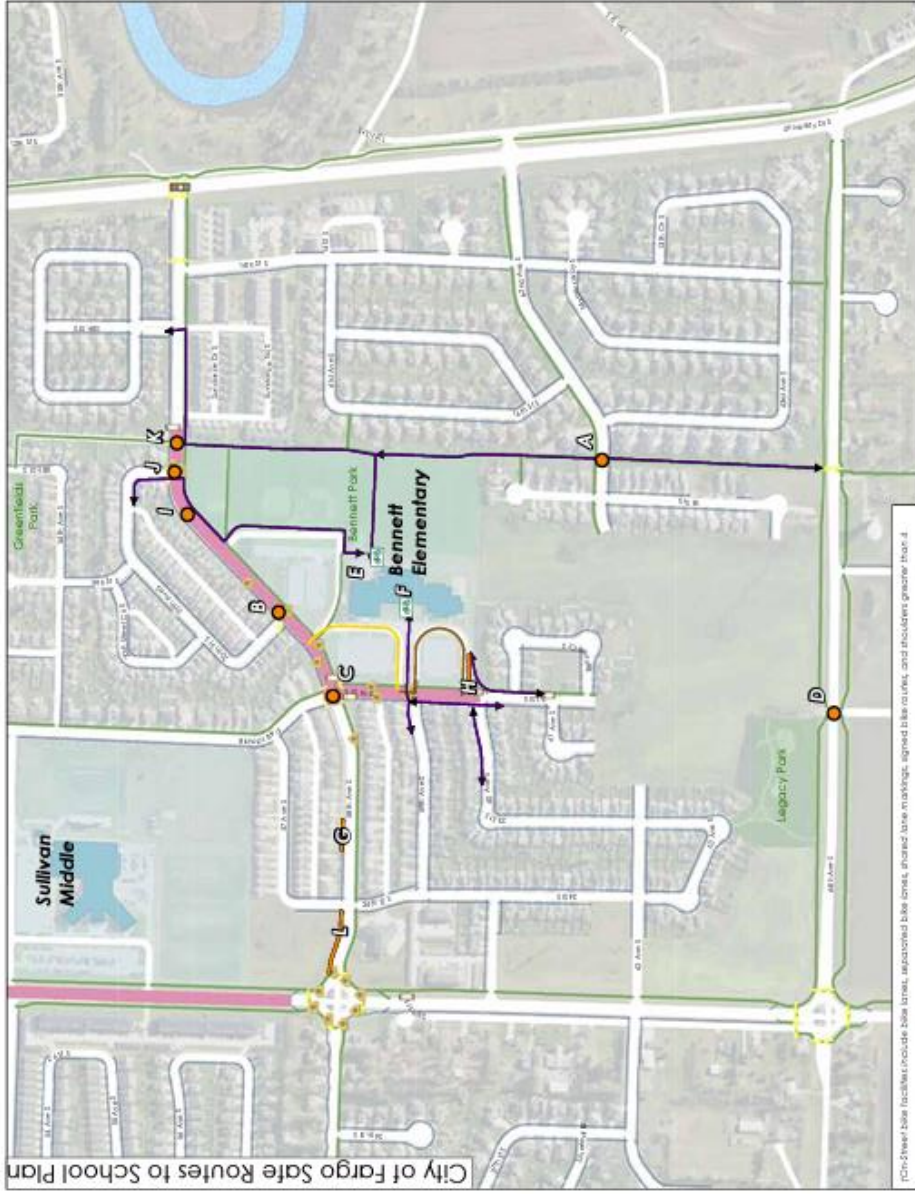
64th Avenue S is outside of the school's current walk zone but was identified as a potential barrier due to the wide lanes and observed high speed traffic.

The shared use path along the eastern edge of the property is a primary north-south circulation route for students walking and biking to school. This trail crosses 58th Avenue S and 62nd Avenue S. There is a flashing beacon at the 58th Avenue S crossing and a bicycle crossing sign at the 62nd Avenue S crossing. During the field review, it was observed that drivers were not anticipating trail users to cross at these locations.

On the west side of the property, incomplete sidewalk networks encourage students to cut across the green space to get to the building.

BENNETT ELEMENTARY CHALLENGES

LOCATION	CHALLENGE
A 62nd Ave S / trail east of 18th St S	Drivers not expecting trail users to cross
B 58th Ave S / 20th St S	Poor driving yielding and stopping compliance Pedestrian visibility is low
C 58th Ave S / 21st St S	Long crossing distances
D 64th Ave S / 21st St S	Wide roadway planned to connect Bennett to future development
E Back of school	Comb style rack does not allow locking of frame and can lead to wheel damage
F Front of school	Comb style rack does not allow locking of frame and can lead to wheel damage
G 58th Ave S between 24th St S and Bishops Blvd	No sidewalk or space for people walking
H Front of school	No sidewalk along shortest path of travel Students cut across green space as shortcut
I 58th Ave S west of 18th St S	Vehicle speeds observed to be high around curve in road
J 58th Ave S / 18th St S	Long crossing distances
K 58th Ave S / trail crossing	Drivers not expecting trail users to cross
L 58th Ave S between 24th St S and 25th St S	No sidewalk or space for people walking



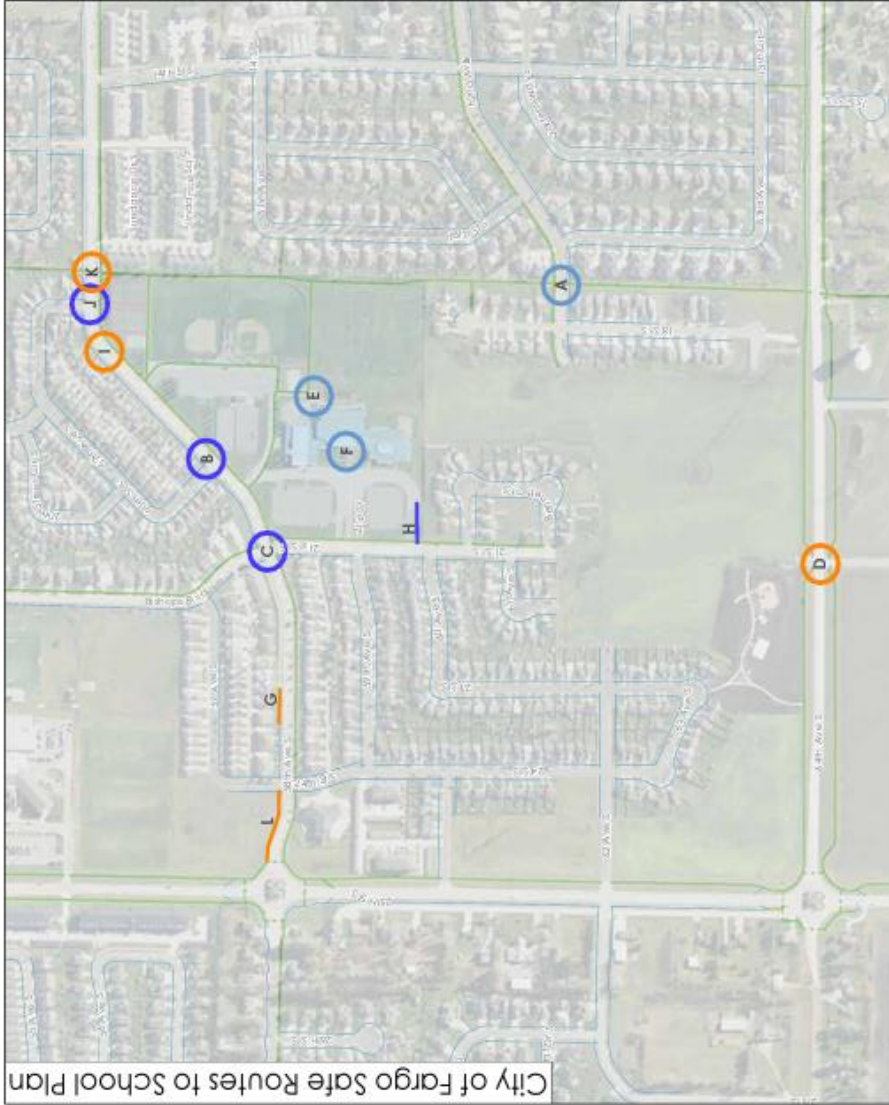
Opportunities for improvement

Due to the identified challenges crossing 58th Avenue S, high impact opportunities for improvement were focused along and across this street in order to make crossings more comfortable for students and families walking to Bennett Elementary. By improving visibility, shortening crossing distances and making it clearer and more obvious where drivers should expect to see people crossing, challenges will likely decrease along 58th Avenue S.







As this area of Fargo grows to the south of school, it will be important to provide comfortable and low stress connections for students and families. In particular, the crossing of 64th Avenue S at 21st Street S should be considered for improvement as more families begin living south of school.

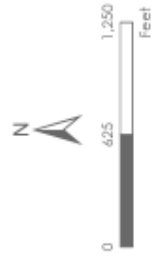
Sidewalks should be installed to connect the existing sidewalk on campus to 21st Street S because many students use and will use 21st Street S to access school.

BENNETT ELEMENTARY OPPORTUNITIES FOR IMPROVEMENT			
LOCATION	POTENTIAL SOLUTION	LEAD AGENCY	IMPACT
A 62nd Ave S / trail crossing	Install high visibility crosswalk; consider installing curb extensions and/or raised crosswalk	City of Fargo	Low
B 58th Ave S / 20th St S	Straighten crossing and extend median safety island; install RRFB	City of Fargo	High
C 58th Ave S / 21st St S	Evaluate the need for left turn lanes; install curb extensions	City of Fargo	High
D 64th Ave S / 21st St S	Provide enhanced pedestrian and bicycle crossing of 64th Ave S with future development	City of Fargo	Medium
E Back of school	Install bike parking to provide two points of contact with bicycle frame (e.g., Inverted U or Post and Ring style rack)	Fargo Public Schools	Low
F Front of school	Install bike parking to provide two points of contact with bicycle frame (e.g., Inverted U or Post and Ring style rack)	Fargo Public Schools	Low
G 58th Ave S between 24th St S and Bishops Blvd	Install sidewalk to fill gap	City of Fargo	Medium
H Front of school	Install sidewalk from 21st along south side of driveway	Fargo Public Schools	High
I 58th Ave S west of 18th St S	Evaluate the need for left turn lanes; consider extending median from Location J to this point	City of Fargo	Medium
J 58th Ave S / 18th St S	Install traffic calming including median safety island	City of Fargo	High
K 58th Ave S / trail crossing	Install RRFB; install traffic calming including median safety island	City of Fargo	Medium
L 58th Ave S between 24th St S and 25th St S	Install sidewalk to fill gap	City of Fargo	Medium

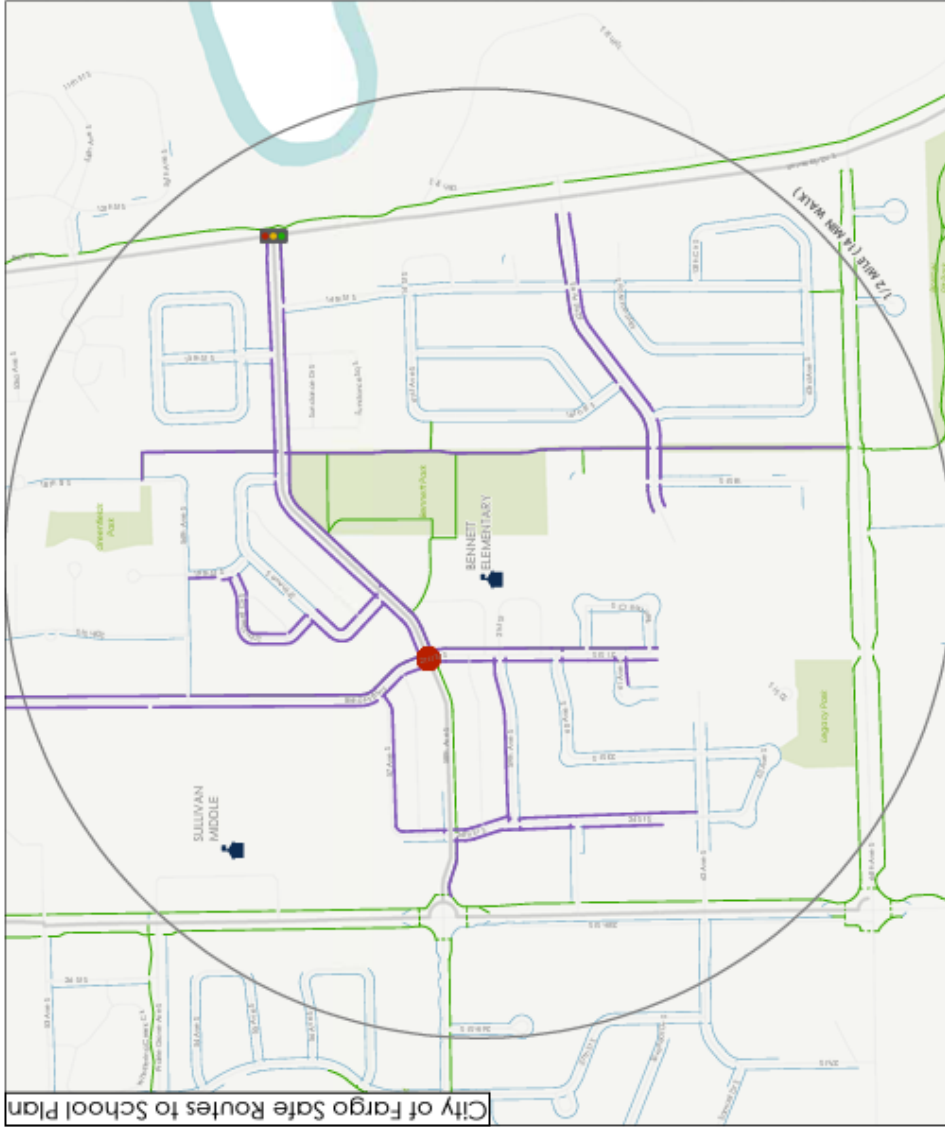


Suggested Routes to School
Bennett Elementary

-  Suggested routes
-  Sidewalks
-  Shared Use Path
-  All-way stops
-  Traffic signal
-  Pedestrian crossing signal



METROCOG



City of Fargo Safe Routes to School Plan

Fargo Public Schools

FARGO SAFE ROUTES TO SCHOOL PLAN

<https://acrobat.adobe.com/link/review?uri=urn:acid:scds:US:ec308529-954b-3394-b9ee-eed37d3aac43>

Appendix B – Article from News4SA: Student inside school told 9-1-1 'send the police now' as cops waited outside (Vertuno & Spagot, 2022)

Written by: Jim Vertuno and Elliot Spagot on May 28th, 2022.

UVALDE, Texas (AP) — Students trapped inside a classroom with a gunman repeatedly called 911 during this week's attack on a Texas elementary school, including one who pleaded, "Please send the police now," as officers waited more than an hour to breach the classroom after following the gunman into the building, authorities said Friday.

The commander at the scene in Uvalde — the school district's police chief — believed that 18-year-old gunman Salvador Ramos was barricaded inside adjoining classrooms at Robb Elementary School and that children were no longer at risk, Steven McCraw, the head of the Texas Department of Public Safety, said at a contentious news conference.

"It was the wrong decision," he said.

Friday's briefing came after authorities spent three days providing often conflicting and incomplete information about the more than an hour that elapsed between the time Ramos entered the school and when U.S. Border Patrol agents unlocked the classroom door and killed him.

Three police officers followed Ramos into the building within two minutes. In the next half hour, as many as nineteen officers piled into the hallway outside. But another 47 minutes passed before the Border Patrol tactical team breached the door, McCraw said.

were no longer at risk.



As the gunman fired at students, law enforcement officers from other agencies urged the school police chief to let them move in because children were in danger, two law enforcement officials said.

The officials spoke on condition of anonymity because they had not been authorized to speak publicly about the investigation.

One of the officials said audio recordings from the scene capture officers from other agencies telling the school police chief that the shooter was still active and that the priority was to stop him.

Ramos killed nineteen children and two teachers inside the room. His motive remained unclear, authorities said.

There was a barrage of gunfire shortly after Ramos entered the classroom where officers eventually killed him, but those shots were "sporadic" for much of the time that officers waited in the hallway, McCraw said. He said investigators do not know if children died during that time.

Throughout the attack, teachers and children repeatedly called 911 asking for help, including the girl who pleaded for the police, McCraw said.

Young survivors of the attack said they pretended to be dead while waiting for help.

Miah Cerrillo, 11, told CNN that she covered herself with a friend's blood to look dead. After the shooter moved into an adjacent room, she could hear screams, more gunfire and music being blared by the gunman. Samuel Salinas, 10, who also played dead, told ABC's "Good Morning America" that the assailant shot teacher Irma Garcia before firing on the kids.

Questions have mounted over the amount of time it took officers to enter the school to confront the gunman.

It was 11:28 a.m. Tuesday when Ramos' Ford pickup slammed into a ditch behind the low-slung Texas school and the driver jumped out carrying an AR-15-style rifle. Five minutes after that, authorities said, Ramos entered the school and found his way to the fourth-grade classroom where he killed the twenty-one victims.

But it was not until around 12:50 p.m. that police killed Ramos, McCraw said, when shots could be heard over a 911 call from a person inside the classroom as officers breached the room.

What happened during that time frame, in a working-class neighborhood near the edge of Uvalde, has fueled mounting public anger and scrutiny over law enforcement's response to Tuesday's rampage.

"They say they rushed in," said Javier Cazares, whose fourth grade daughter, Jacklyn Cazares, was killed in the attack, and who raced to the school as the massacre unfolded. "We didn't see that."

According to the new timeline provided by McCraw, after crashing his truck, Ramos fired on two people coming out of a nearby funeral home, officials said.

Contrary to earlier statements by officials, a school district police officer was not at the school when Ramos arrived. When that officer did respond, he unknowingly drove past Ramos, who was crouched behind a car parked outside and firing at the building, McCraw said.

At 11:33 a.m., Ramos entered the school through a rear door that had been propped open and fired more than 100 rounds into a pair of classrooms, McCraw said. He did not address why the door was propped open.

Two minutes later, three local police officers arrived and entered the building through the same door, followed soon after by four others, McCraw said. Within 15 minutes, officers from different agencies had assembled in the hallway, taking sporadic fire from Ramos, who was holed up in a classroom.

Ramos was still inside at 12:10 p.m. when the first U.S. Marshals Service deputies arrived. They had raced to the school from nearly seventy miles (113 kilometers) away in the border town of Del Rio, the agency said in a tweet Friday.

But the commander inside the building — the school district's police chief, Pete Arredondo — decided the group should wait to confront the gunman, on the belief that the scene was no longer an active attack, McCraw said.

The crisis came to an end at 12:50 p.m., after officers used keys from a janitor to open the classroom door, entered the room and fatally shot Ramos, he said.

Arredondo could not be reached for comment Friday. No one answered the door at his home, and he did not reply to a phone message left at the district's police headquarters.

Gov. Greg Abbott, who at a Wednesday news conference lauded the police response, said Friday that he was "misled," and he's "livid."

In his earlier statements, the governor told reporters, he was repeating what he had been told. "The information that I was given turned out, in part, to be inaccurate," he said.

Abbott said exactly what happened needs to be "thoroughly, exhaustively" investigated.

The governor previously praised law enforcement for their "amazing courage by running toward gunfire" and their "quick response."

On Friday, Abbott had been set to attend the annual convention of the National Rifle Association, which is being held across the state in Houston. Instead he addressed the gun-rights group's convention by recorded video and went to Uvalde.

At the convention, speaker after speaker took the stage to say that changing U.S. gun laws or further restricting access to firearms isn't the answer.

"What stops armed bad guys is armed good guys," Texas Sen. Ted Cruz told those gathered in Houston.

Former President Donald Trump was among Republican leaders speaking at the event, where hundreds of protesters angry about gun violence demonstrated outside, including some who held crosses with photos of the Uvalde victims.

The motive for the massacre — the nation's deadliest school shooting since Newtown, Connecticut, almost a decade ago — remained under investigation. Authorities have said Ramos had no known criminal or mental health history.

During the siege, frustrated onlookers urged police officers to charge into the school, according to witnesses.

"Go in there! Go in there!" women shouted at the officers soon after the attack began, said Juan Carranza, 24, who watched the scene from outside a house across the street.

Cazares said that when he arrived, he saw two officers outside the school and about five others escorting students out of the building. But 15 or 20 minutes

passed before the arrival of officers with shields, equipped to confront the gunman, he said.

As more parents flocked to the school, he and others pressed police to act, Cazares said. He heard about four gunshots before he and the others were ordered back to a parking lot.

"A lot of us were arguing with the police, 'You all need to go in there. You all need to do your jobs.' Their response was, 'We can't do our jobs because you guys are interfering,'" Cazares said.

The many chilling details of the attack were enough to leave parents struggling with dread.

Visiting a downtown memorial to those killed, Cassandra Johnson of the nearby community of Hondo said she was so worried the day after the attack that she kept her twin boys home from school.

Before she sent the 8-year-olds back, she studied the school building, figuring out which windows she would need to break to reach them. And she drew hearts on their hands with marker, so she could identify them if the worst happened, Johnson said, as she put flowers near twenty-one white crosses honoring the victims.

"Those kids could be my kids," she said.

Appendix C – Article from the Palestine Herald – Press: *TIMELINE: Texas elementary school shooting, minute by minute (Bleiberg & Murphy, 2022)*

Written by: Jake Bleiberg and Sean Murphy Associated Press

In the hours and days following the fatal shooting of 19 children and their two teachers at Robb Elementary School in Uvalde, Texas, on Tuesday, authorities gave shifting and at times contradictory information of what happened and how they responded.

The investigation of the massacre is ongoing, but much is already known about the nearly two hours that passed between when authorities say Salvador Ramos shot his grandmother and when police radio traffic indicated that the 18-year-old gunman was dead and the siege was over.

TIMELINE

Sometime after 11 a.m. — Ramos shoots his grandmother in the face, according to Texas Public Safety Director Steve McCraw. Gilbert Gallegos, 82, who lives across the street from Ramos and his grandmother, heard a shot as he was in his yard. He runs to the front and sees Ramos speed away in a pickup truck and Ramos' grandmother coming toward him pleading for help. Covered in blood, "She says, 'Berto, this is what he did. He shot me,'" according to Gallegos, whose wife calls the police to report the shooting.

11:27 a.m. — Video shows a teacher, whom authorities have not publicly identified, propping open an exterior door of the school, McCraw said.

11:28 a.m. — The teacher exits to retrieve a phone and then returns through the exit door, which remains propped open, McCraw said. It's not clear why the teacher was retrieving a phone. Department of Public Safety spokesman Travis Considine said Thursday that investigators hadn't determined why the door was propped open.

11:28 a.m. — Ramos crashes the pickup into a drainage ditch behind the school, McCraw said. Two men at a nearby funeral home hear the crash and run out to see what happened. They see Ramos jump out of the passenger side carrying an AR-15-style rifle and a bag full of ammunition. The men run and Ramos fires at them but does not hit them. One of the men falls but both make it back to the funeral home. A panicked teacher then emerges from the school and calls 911.

11:30 a.m. — 911 receives a call saying there was a crash and a man with a gun at the school, McCraw said.

11:31 a.m. — Ramos begins shooting at the school from the school parking lot as police cars begin to arrive at the funeral home, McCraw said. Ramos then makes his way around the school building.

The school district police officer who was working that day was not on campus around this time, contrary to previous reports, McCraw said Friday. The officer drives to the school “immediately” after getting the 911 call and approaches someone at the back of the school who he thought was the gunman. As the officer “sped” toward the man, who turned out to be a teacher, McCraw said the officer “drove right by the suspect who was hunkered down behind” a vehicle.

11:32 a.m. — Ramos fires multiple shots at the school and then makes his way toward the open door, McCraw said.

11:33 a.m. — Five minutes after crashing the pickup, Ramos enters the school and begins shooting into two adjoining classrooms, 111 and 112, McCraw said. He fires more than one hundred rounds.

11:35 a.m. — Three city police officers enter the school through the same door that Ramos used and are later followed by four other officers, McCraw said, putting a total of seven inside the building. Two officers receive “grazing wounds” from Ramos, McCraw said.

11:37 a.m. — Gunfire continues, with sixteen rounds being shot in total, McCraw said. It is unclear who fired the shots.

11:51 a.m. — A police sergeant and other law enforcement begin to arrive, McCraw said.

12:03 p.m. — A female (age unknown) calls 911 and whispers that she's in classroom 112, McCraw said. The call lasts 1 minute, 23 seconds.

12:03 p.m. — Officers continue to enter the school, with as many as nineteen officers in the hallway near the room where Ramos is holed up, McCraw said.

12:06 p.m. — Anne Marie Espinoza, a spokeswoman for the Uvalde Consolidated Independent School District, posts on the district's Facebook page: “All campuses are under a Lockdown Status.

“Uvalde CISD Parents: Please know at this time all campuses are under a Lockdown Status due to gunshots in the area. The students and staff are safe in the buildings. The buildings are secure in a Lockdown Status. Your cooperation is needed at this time by not visiting the campus. As soon as the Lockdown Status is lifted you will be notified.”

“Thank you for your cooperation!”

12:10 p.m. — The female (age unknown) who called 911 at 12:03 p.m. calls 911 again and says there are multiple dead, McCraw said. She calls again at

12:13 p.m. and then again at 12:16 p.m., when she says there are eight to nine students alive.

12:10 p.m. — The first group of deputy U.S. marshals from Del Rio arrive from nearly 70 miles (113 kilometers) away to assist the various other law enforcement officers already on scene, according to the Marshals Service.

12:15 p.m. — U.S. Border Patrol tactical team members arrive with shields, McCraw said.

12:19 p.m. — Another girl in room 111 calls 911 and ends the call when a fellow student tells her to hang up, McCraw said.

12:21 p.m. — Ramos fires his gun again and officers believe he's at one of the door of one of the adjoining classrooms, McCraw said. Police move down the hallway.

12:21 p.m. — Three shots can be heard during a 911 call, McCraw said. Around this time, police are stuck in the hallway because both classroom doors are locked and they must seek keys from a school employee.

12:36 p.m. — A child calls 911 for 21 seconds.

Around this time, a girl calls 911 and is told to stay on the line and stay very quiet, McCraw said. The girl says, "He shot the door."

12:43 p.m. — The girl urges the 911 dispatcher to "please send the police now."

12:46 p.m. — The girl says she can "hear the police next door."

12:47 p.m. — She again asks 911 to "please send the police now."

12:50 p.m. — Officers open the doors with keys from a school employee, enter the classroom and kill Ramos, McCraw said. Shots can be heard over the 911 call.

12:51 p.m. — Officers can be heard moving children out of the room, McCraw said.

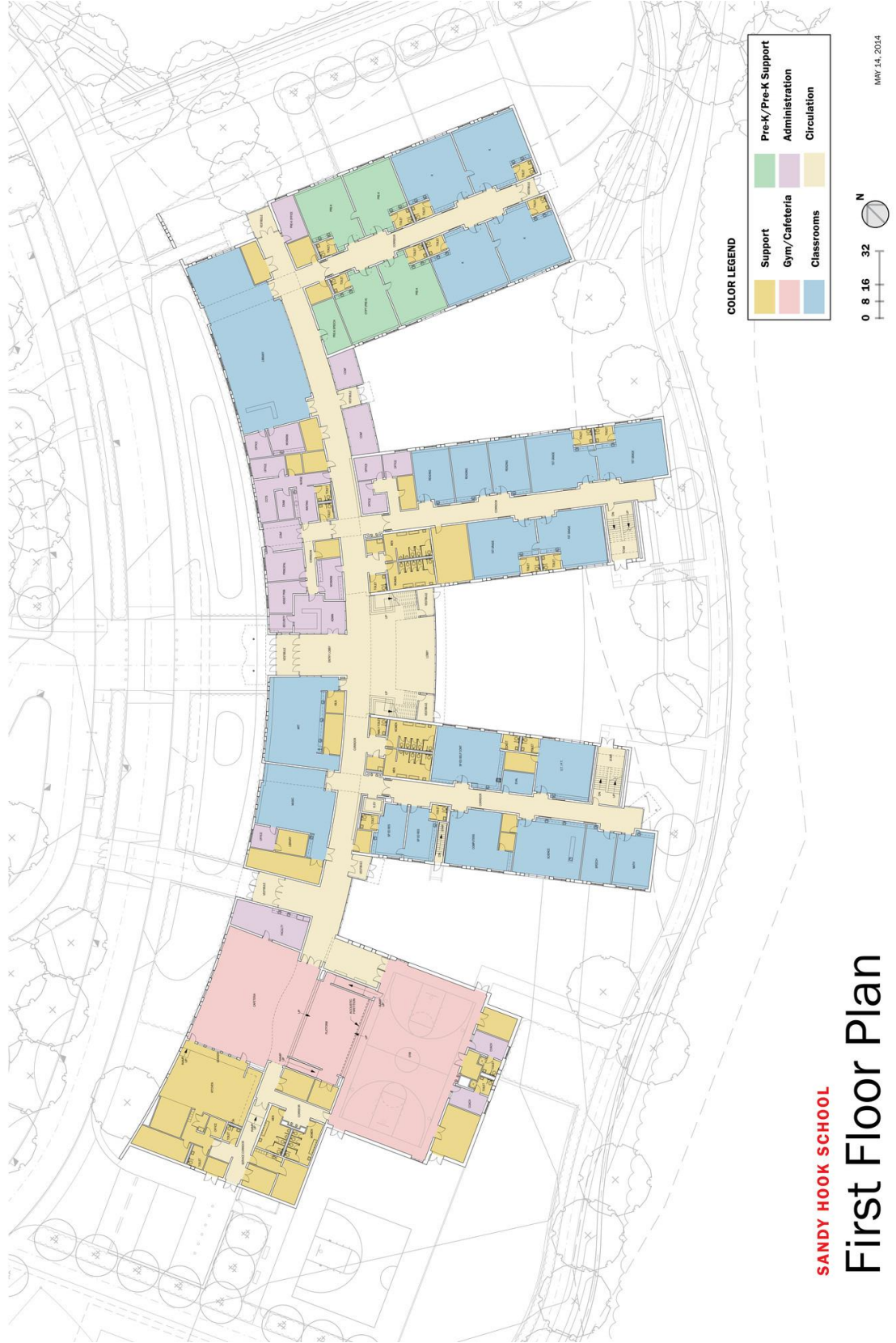
12:58 p.m. — Law enforcement radio chatter says Ramos has been killed and the siege is over, said Victor Escalon, regional director for the Texas Department of Public Safety.

Appendix D – Sandy Hook Elementary Floor Plan

<https://archive.curbed.com/2018/2/22/17042004/sandy-hook-elementary-school-design-security-safety>

SVIGALS + PARTNERS

Architecture + Art



Appendix E – Horace Mann Circulation

Horace Mann Elementary

FARGO SAFE ROUTES TO SCHOOL PLAN 88

Horace Mann Elementary

1025 3rd Street N, Fargo, ND 58102

DISTRICT

Fargo Public School District #1

GRADES

K-2

AVERAGE ENROLLMENT

355 (with Roosevelt)

ARRIVAL

8:40 a.m.

DISMISSAL

3:02 p.m.



Existing Conditions

Horace Mann Elementary is a kindergarten through 2nd grade school in the Fargo Public School District. It is located less than one mile north of Downtown Fargo in the city's Horace Mann Neighborhood. The neighborhood consists primarily of single-family residential land uses. Within the Horace Mann boundaries, per capita incomes and median household incomes are significantly lower than the district average. More than 41 percent of students are eligible for free and reduced lunch programs. Less than four percent of students participate in English Language Learners programs.

The Horace Mann school facility was constructed in 1915. In 2008, Horace Mann Elementary and Roosevelt Elementary schools were joined together with kindergarten through 2nd grades housed at the Horace Mann campus, while grades 3 through 5 attend Roosevelt Elementary. Prior to 2008, both schools included kindergarten through 5th grade.

The Horace Mann campus is bound by 3rd Street N to the west, 11th Avenue N to the north, 2nd Street N to the east, and 10th Avenue N to the south. The roads surrounding the campus consist of local roads with primarily localized traffic patterns. There are sidewalks on both sides of the roadway throughout the walk zone. There are designated school speed zones on 2nd Street N between 11th Avenue N and 10th Avenue N and along Broadway between 12th Avenue N and 11th Avenue N.

Parents and caregivers dropping off and picking up use the parking lot on the east, but occasionally drop students off in the same loop as buses on the west, creating potential conflicts between users. Along the western edge of the parking lot driveway, there are no pedestrian facilities, which limits access to the school building from 10th Avenue N.



▲ Intersections along 2nd Street N have inconsistent pavement markings and long crossing

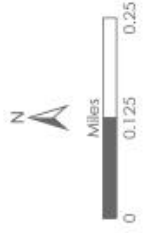


▲ There is no pedestrian space along the western edge of the parking lot, connecting 10th Avenue N to the school building.

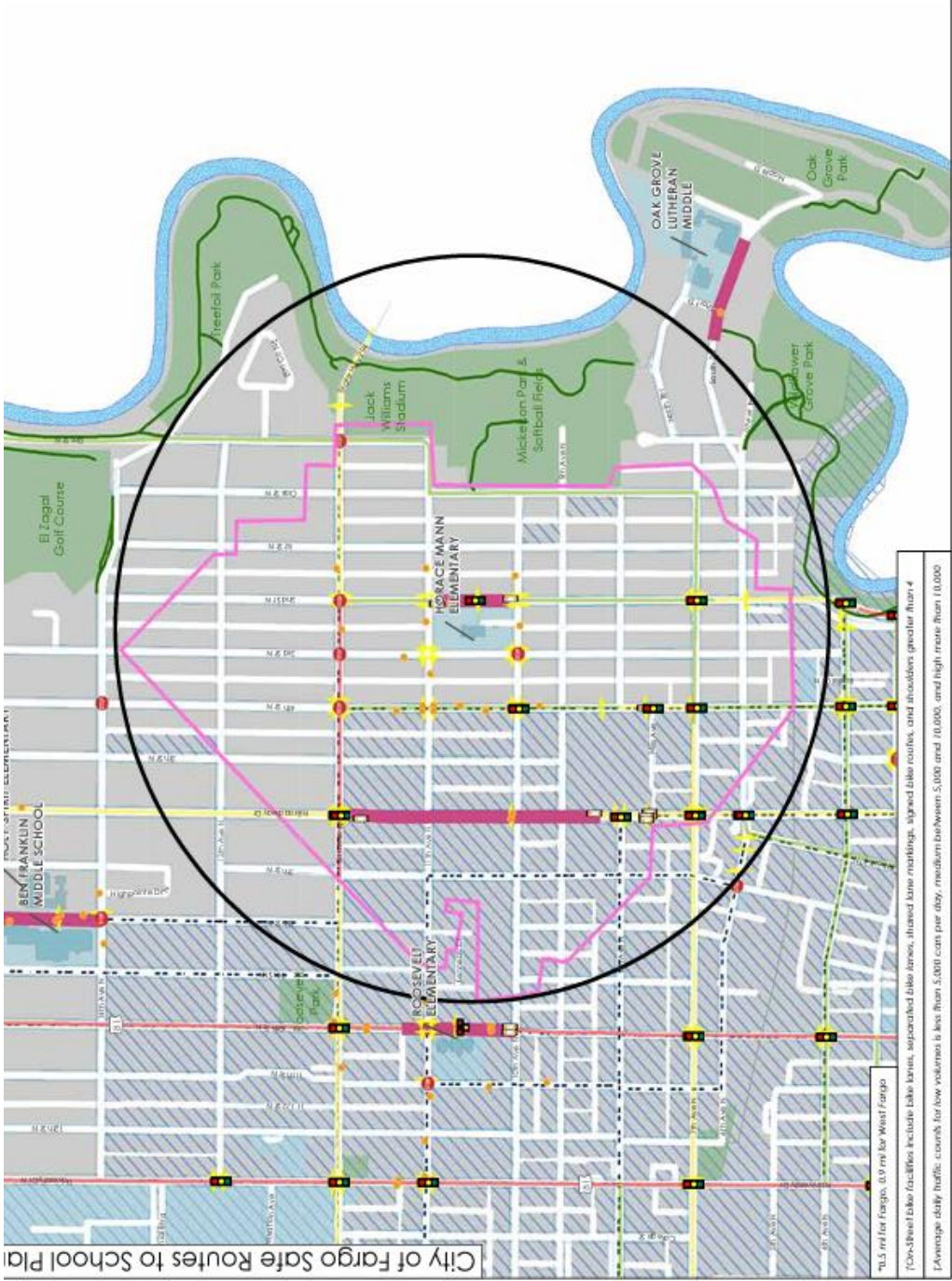
Existing Conditions Horace Mann Elementary

- School Study Area*
 - Walk Zones
 - Building Footprints
 - School Grounds
 - Park
 - Environmental Justice Areas
 - School Speed Zone
 - Shared Use Path
 - On-Street Bike Facility
 - Sidewalk
 - Crosswalk
 - Pedestrian Crossing Sign
 - 4-Way Stop Sign
 - HAWK Signal
 - Other Flashing Sign
 - Signalized Intersection
- Traffic Volume†**
- Low
 - Medium
 - High

*Horace Mann serves grades K-2



METROCOG



City of Fargo Safe Routes to School Plan

†0.5 mi for Fargo, 0.9 mi for West Fargo

†Classification locations include lake lanes, separated bike lanes, shared bike markings, signed bike routes, and shoulders greater than 4 feet wide. Average daily traffic counts for low volumes is less than 5,000 cars per day, medium between 5,000 and 10,000, and high more than 10,000.

Circulation Challenges

The Horace Mann campus is a traditional neighborhood school, with a smaller campus and fewer vehicle spaces than some of the newer schools, often resulting in unique congestion and potential conflicts. On the west side, the loop is used by both parents and caregivers and buses, creating conflict and congestion.

On 2nd Street N and 3rd Street N, there are multiple locations that would benefit from improved crossings and pavement markings. There is a mid-block traffic signal on 2nd Street N that may need to be re-timed to be more responsive to the pedestrian activation. In multiple field observations, the time between activation and walk signal varied from eight seconds to 40 seconds.

HORACE MANN ELEMENTARY CHALLENGES

LOCATION	CHALLENGE
A 2nd St N / 10th Ave N	Inconsistent crosswalk marking Long crossing distances
B 2nd St N / 11th Ave N	Inconsistent crosswalk marking Long crossing
C 3rd St N / 10th Ave N	Driver yielding compliance is low
D 3rd St N / 11th Ave N	Long crossing distances
E 2nd St N midblock	Phasing and timing of pedestrian crossing varies
F Bus / parent Drop	Private vehicles use the loop to drop students off while students from bus also use it to walk into school Potential conflicts between users
G South side of Building	Lack of separation from driveway and pedestrian areas
H Access to building between 10th Ave N and south entrance	Lack of separation from driveway and pedestrian areas
I Eastside of building near playground	Comb style rack does not allow locking of frame and can lead to wheel damage

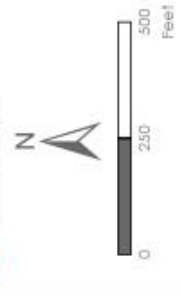


Observed Circulation & Challenges
Horace Mann Elementary
Key*

- Bus Circulation
- Challenge
- Shared Bus and Vehicle Lane
- Vehicle Drop-off and Pick-up
- Observed Walking and Biking Routes
- Bike Rack
- Challenge

Existing Infrastructure*

- Building Footprints
- School Grounds
- School Speed Zones
- On-Street Bike Facility†
- Sidewalk
- Shared Use Path
- Crosswalk Marking
- Signalized Intersection
- HAWK Signal
- Other Flashing Sign
- Pedestrian Crossing Sign
- 4-Way Stop Sign



METROCOG
*Suggested Correlation to AAS Map - Not all Facilities Present on AAS Map

†On-Street bike facilities include bike lanes, separated bike lanes, shared bike lanes, shared bike lanes, shared bike lanes, shared bike lanes, and shoulders greater than 4

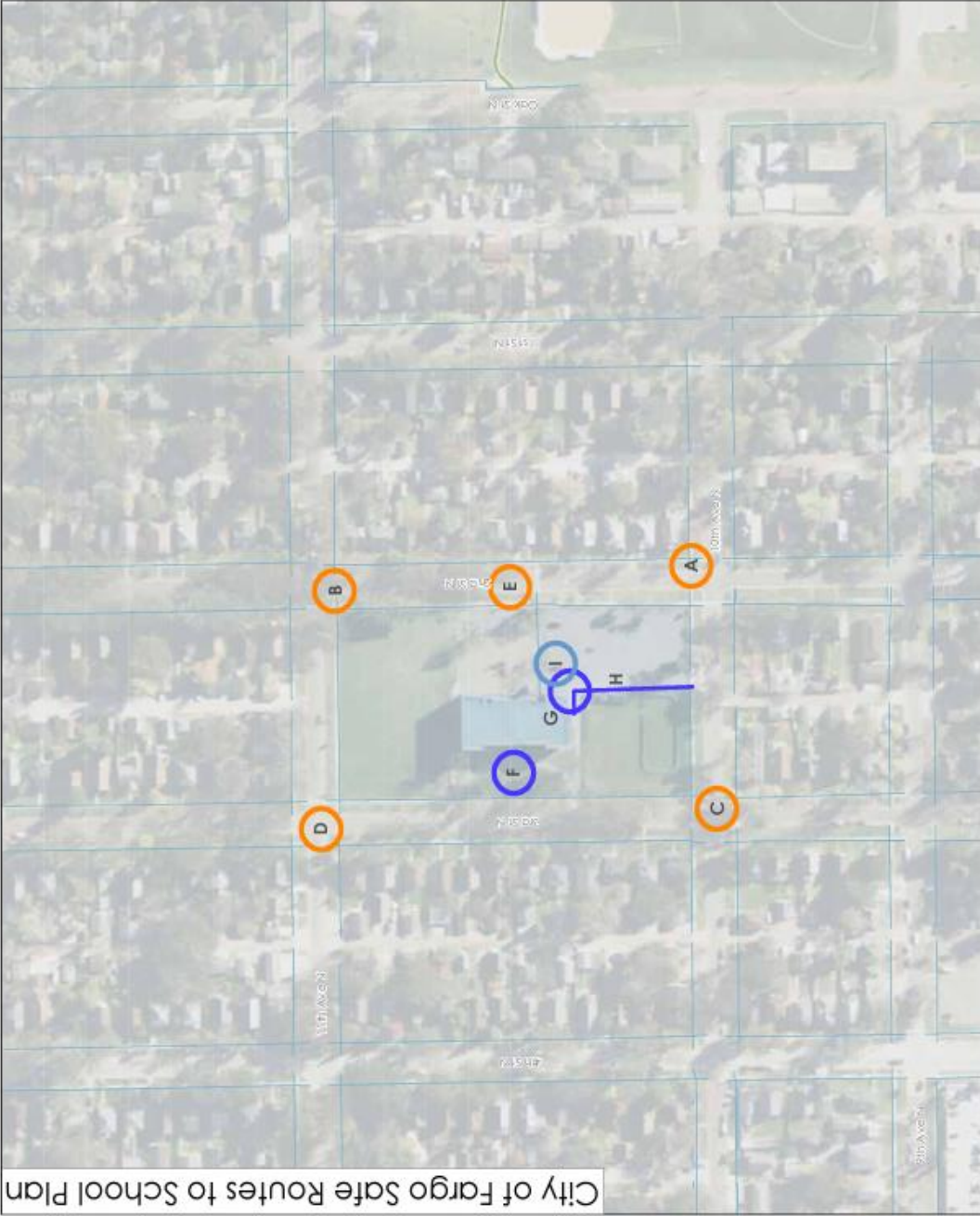
Opportunities for improvement

Because the streets surrounding Horace Mann have relatively low traffic volumes and speeds, the highest impact opportunities for improvement are located on school grounds. In particular, installing a separated and raised space for people walking to the south door would likely increase comfort for students and families and decrease the chances for conflict between drivers and people walking. Additionally, the bus loop on the west side of school should be closed to parents and caregivers dropping and pick up students – this would limit potential conflicts.

Curb extensions on the four corners of campus to shorten crossings, increase visibility, and calm traffic are of lower impact because of existing traffic volumes and speeds, but should be considered to increase comfort for students and families.

HORACE MANN ELEMENTARY OPPORTUNITIES FOR IMPROVEMENT

LOCATION	POTENTIAL SOLUTION	LEAD AGENCY	IMPACT
A 2nd St N / 10th Ave N	Consider curb extensions on north and west crossings or median safety island on 10th Ave; install forward stop bars	City of Fargo	Medium
B 2nd St N / 11th Ave N	Consider curb extensions on south and west crossings or median safety island on 10th Ave; install forward stop bars	City of Fargo	Medium
C 3rd St N / 10th Ave N	Install curb extensions (prioritize north and east crossings); install forward stop bars	City of Fargo	Medium
D 3rd St N / 11th Ave N	Install curb extensions (prioritize south and east crossings); install forward stop bars	City of Fargo	Medium
E 2nd St N midblock	Evaluate signal timing and phasing for consistency	City of Fargo	Medium
F Bus / parent drop	Close loop to personal vehicle traffic; install bus loop and one-way signage	Fargo Public Schools	High
G South side of building	Install raised and separated curb space; install ADA compliant curb ramp	Fargo Public Schools	High
H Access to building between 10th Ave N and south entrance	Install raised curb space with separation from vehicle drop-off lane; connect to existing sidewalk network	Fargo Public Schools	High
I East side of building near playground	Install bike parking to provide two points of contact with bicycle frame (e.g., Inverted U or Post and Ring style rack)	Fargo Public Schools	Low

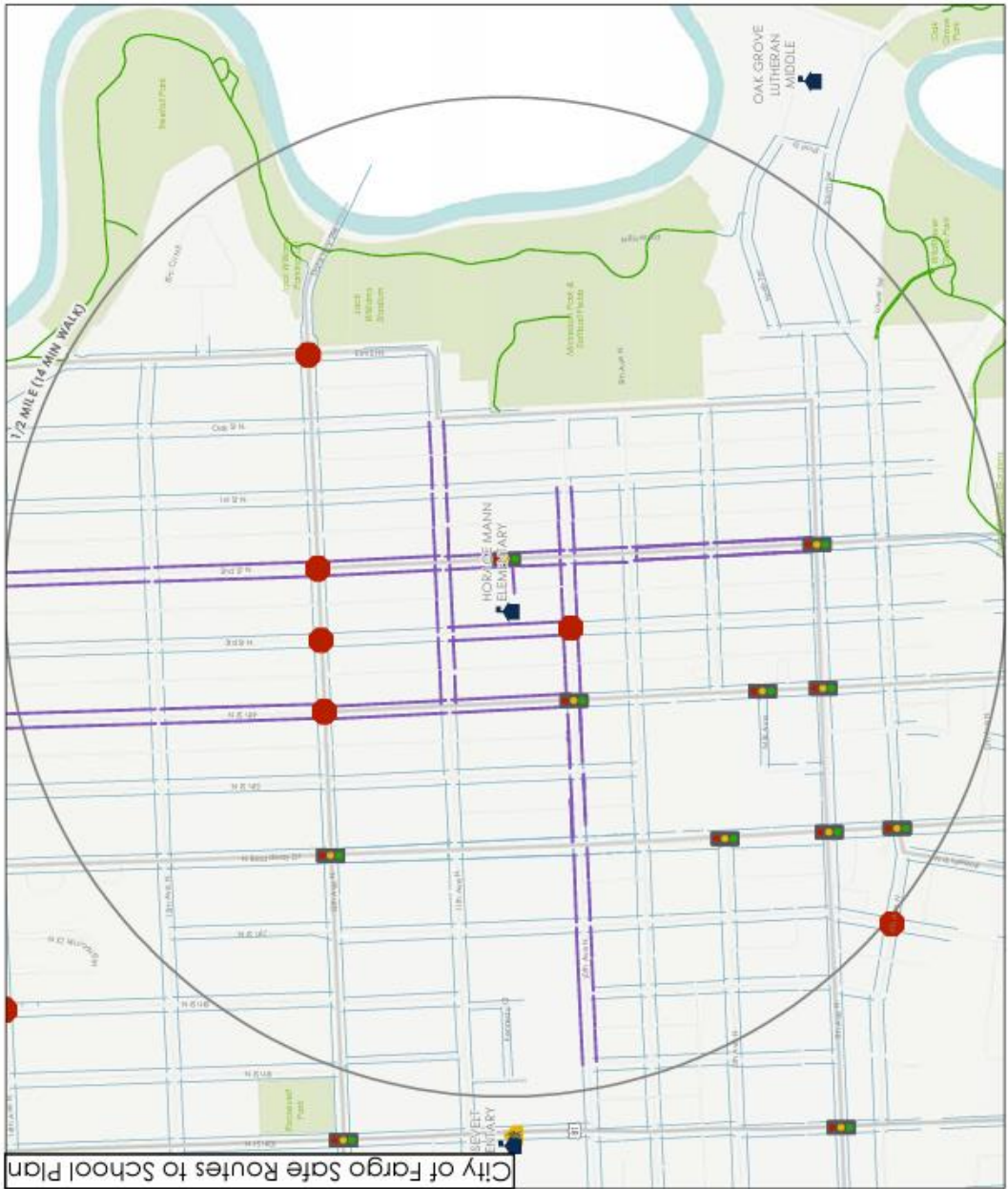


Infrastructure Opportunities
Horace Mann Elementary

- Opportunities for Improvement Locations**
- High Impact
 - Medium Impact
 - Low Impact
- Opportunities for Improvement Segments**
- High Impact
 - Medium Impact
 - Low Impact
 - Shared Use Path
 - Sidewalk
 - Building footprint
 - School grounds

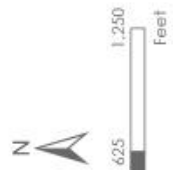


City of Fargo Safe Routes to School Plan



Suggested Routes to School
Horace Mann Elementary

- Suggested routes
- Sidewalks
- Shared Use Path
- All-way stops
- Traffic signal
- Pedestrian crossing signal



METROCOG

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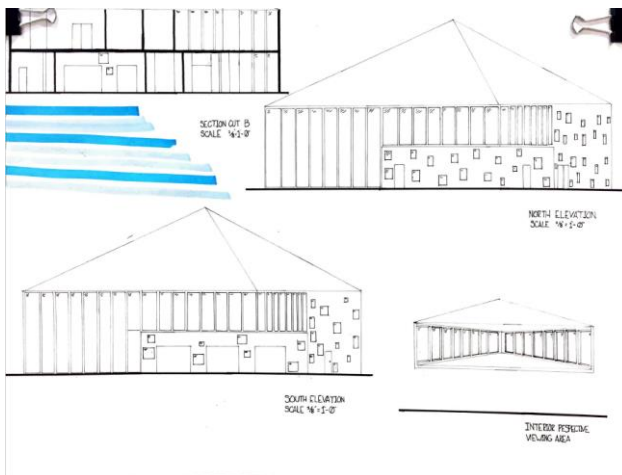
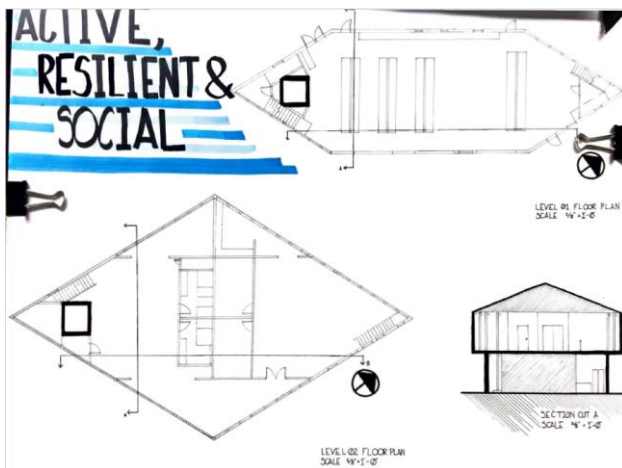
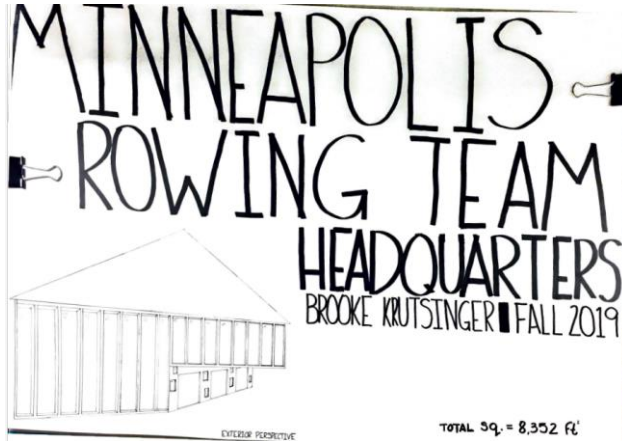
Previous Design Studio Experience

Please note that these are just some of my past projects, if you would like to see more, please visit my website:

<https://0d1652d1-adfa-4085-b9dd-5ffa5bc4f411.godaddysites.com>

FALL 2019 – THE BOAT HOUSE

Final Presentation Board:



Model Pictures:



FALL 2019 – CONVERGING STUDIOS

Final Presentation Board:

CONVERGING STUDIO

BROCKE KRUTSINGER | FALL 2019

THE CONVERGING STUDIO IS BROKEN UP INTO TWO STRUCTURES, ONE BEING THE LIVING SPACE AND THE OTHER BEING THE STUDIO. THE LIVING SPACE IS A TOTAL OF 1,900 SQUARED FEET, INCLUDING ONE BEDROOM, WITH A WALK IN CLOSET, ONE BATHROOM, LAUNDRY ROOM AND A KITCHEN THAT IS PARTIALLY CONNECTED TO THE LIVING SPACE. WITH AN OPEN CONCEPT AND THE LARGE FLOOR TO CEILING WINDOWS, THE OCCUPANT HAS A GREAT VIEW OF THE RIVER AND HAS THE BEAUTIFUL GLOW OF THE SUNRISE WITHOUT THE DIRECT BRIGHTNESS OF THE EARLY MORNING SUN. THE STUDIO HAS A TOTAL OF 1,600 SQUARED FEET WITH A WASHROOM, INCLUDING A LARGE SINK FOR BIGGER MESSAGES, AND A STORAGE ROOM WITH BUILT IN SHELVING READY TO USE; WITH ALSO HAVING AN OPEN CONCEPT AND LARGE WINDOWS, THE OCCUPANT HAS THE VIEW OF NATURE AS WELL AS THE GLOW OF THE SUNRISE, STILL WITHOUT THE DIRECT BRIGHTNESS OF THE SUN. CONNECTING THE TWO IS A DECK THAT CONVERGES TO A SMALLER WALKWAY CONNECTING THE PRIVATE DECK AND THE SHARING SPACE FOR POSSIBLE GUESTS. INSPIRED BY WALTER DE MARIA'S *MILE LONG DRAWING*, THE TWO BUILDINGS ARE ANGLED IN SUCH A WAY THAT PERCEIVES THE PERCEPTION OF HIS PIECE, JUST IN A SMALLER SCALE. WITH A DRAWING IN SUCH MAGNITUDE, BEING AN ACTUAL MILE LONG, LOOKING DOWN ITS PATH YOU CAN SEE THE TWO LINES MEET, EVEN THOUGH THEY ACTUALLY NEVER DO AND ARE ALWAYS PARALLEL. BEING SO, THE TWO BUILDINGS ARE ACTING AS WHAT YOUR EYES WOULD SEE LOOKING DOWN MARIA'S TWO LINES.

Architectural drawings showing exterior and interior perspectives and elevations of the Converging Studio. The drawings include:

- SW ELEVATION SCALE 1/4" = 1'-0"
- EXTERIOR PERSPECTIVE
- INTERIOR PERSPECTIVE
- NE ELEVATION SCALE 1/4" = 1'-0"

Architectural drawings showing the floor plan, sections, and plan view of the Converging Studio. The drawings include:

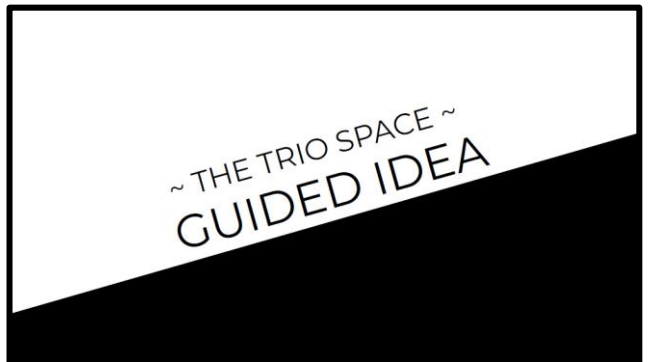
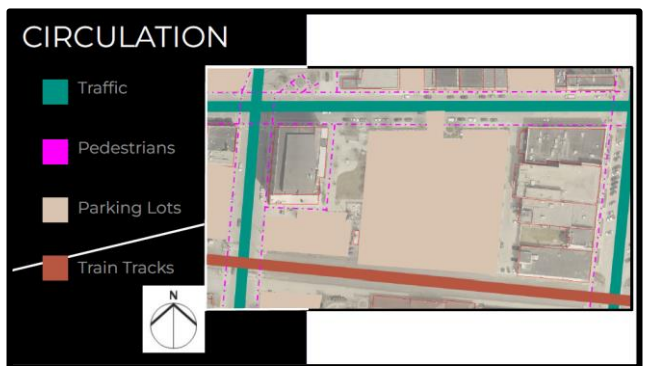
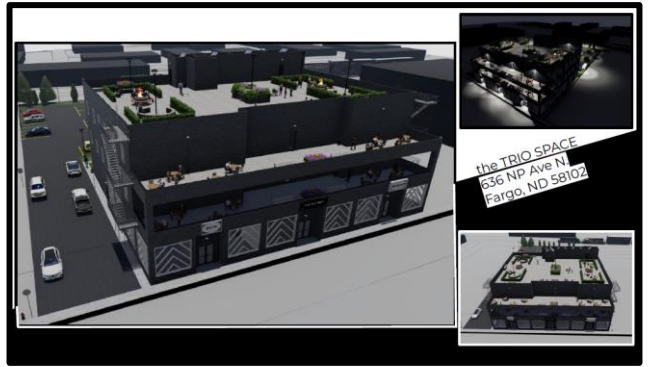
- FLOOR PLAN SCALE 1/8" = 1'-0"
- SECTION OF A SCALE 1/4" = 1'-0"
- SECTION OF B SCALE 1/4" = 1'-0"
- SECTION OF C SCALE 1/4" = 1'-0"
- PLAN VIEW SCALE 1/8" = 1'-0"

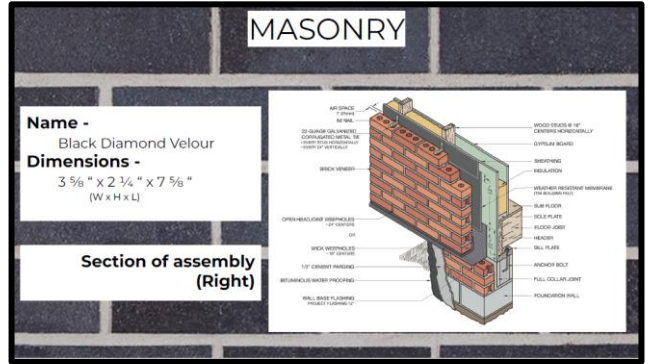
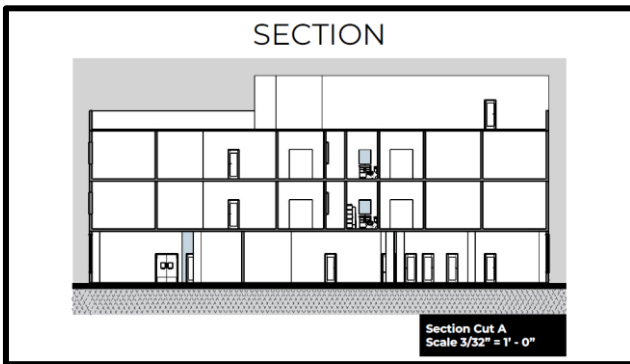
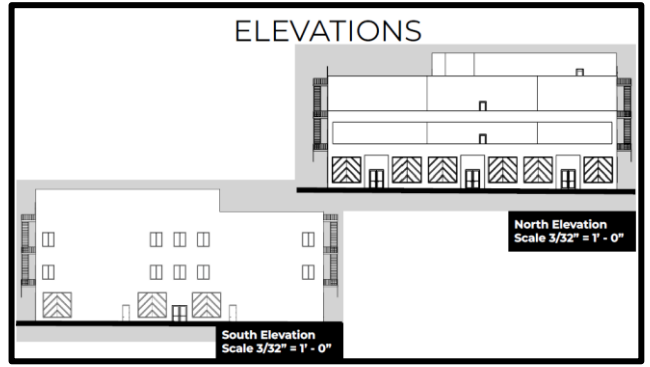
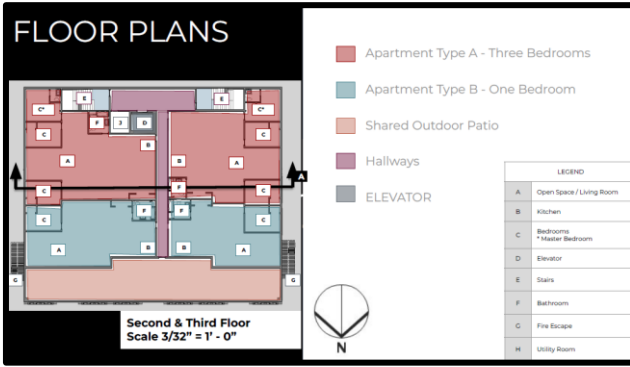
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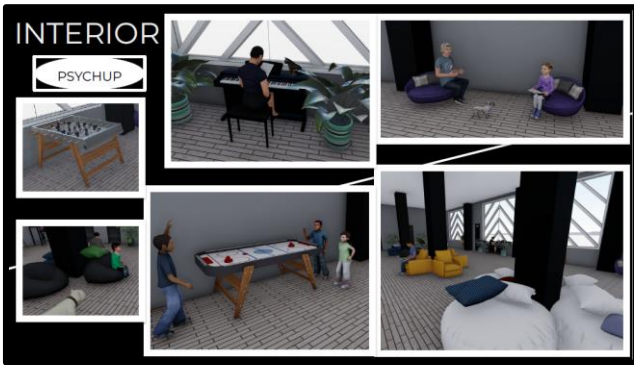


FALL 2020 – THE TRIO SPACE

Final Presentation:







SPRING 2021 – THE BUS BARN

Final Presentation:



TABLE CONTENTS

- Bus Barns ----- Page 01
- Site Analysis ----- Page 03
- Proposed Site ----- Page 05
- Floor Plans ----- Page 07
- Elevations ----- Page 11
- Wall Details ----- Page 15
- Interior Elevations ----- Page 17
- Hand Drawings ----- Page 19
- Schedules ----- Page 22
- Ceiling Plans ----- Page 25
- Stair Details ----- Page 28

HISTORY ~
Public transportation or 'ride sharing' has been around since about the 1820s with horse-drawn cars that were designed to hold 8-10 people at a time. Even though it was a good thought, the carriages were extremely uncomfortable due to that, not only were the seats were wood, but the streets were still paved with cobblestone at this time. As a result, public transportation evolved to railroad technology, and eventually the cable car and then streetcar. As the nation modernized, rail transit, such as subways, rose in popularity as it didn't have traffic delays and had a higher volume compared to buses. However, companies soon realized that buses were more cost-effective and more efficient, which is why buses are the most widely used transportation system to this day.

TYPOLOGY ~
Public transportation ~ The goal of public transportation is to provide people with mobility and access to employment, education, retail, health, etc., while trying to give an alternative to the reliance of personal cars. Using public transportation also helps with the overall traffic of the area and provides a sustainable type of transportation.

WHAT IS IT? ~
Buses are the most common type of public transportation in today's society, and as cities continue to grow and spread out, more and more routes are needed to be created to reach as much of the general public possible. By creating more routes, more buses are needed, and by getting more buses, a space is needed to park the bus, a space is needed to maintain the bus and a space is needed to wash the bus.

PAGE 01

THE COMPANY ~
Valley Bus has been apart of Fargo-Moorhead for decades and is a family owned business. It provides transportation to not only students (K - 12) but as well as colleges and the general public for any type of activities, such as weddings, meetings, sports, tours, etc.

KEY ~

- Big Bus Lot
- SPED Bus Lot
- Coach (Charter) Bus Lot & Garage
- West Fargo Bus Lot

School Buses ~
Length: 29 to 37
Capacity: 50 to 88 students

Special Education Buses ~
Length: 20' to 25'
Capacity: up to 15 students

Coach (Charter) Buses ~
Length: 40' to 50'
Capacity: 42 to 76 persons

Unique Coach (Charter) Buses ~
Triley ~ Length: 45
Capacity: approx 27
Party Bus (w/ TV Venues) ~ Length: 35
Capacity: approx 23

PAGE 02

ADDRESS ~
3361 & 3315
WESTRAC DR, S
FARGO, ND 58103

CONTOURS ~

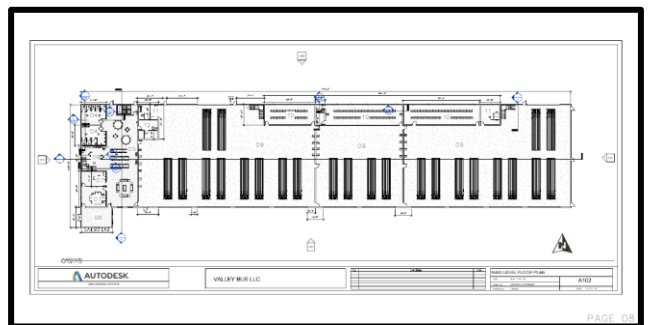
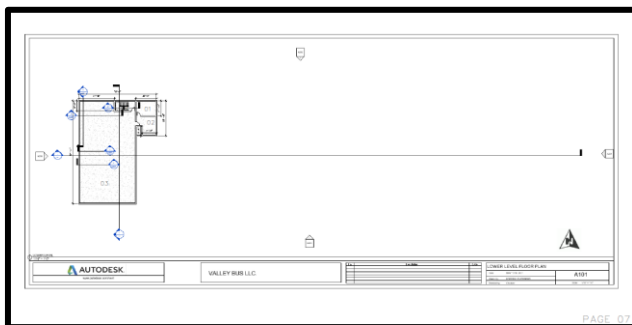
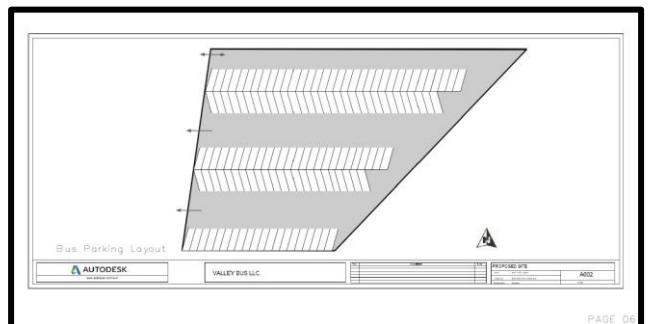
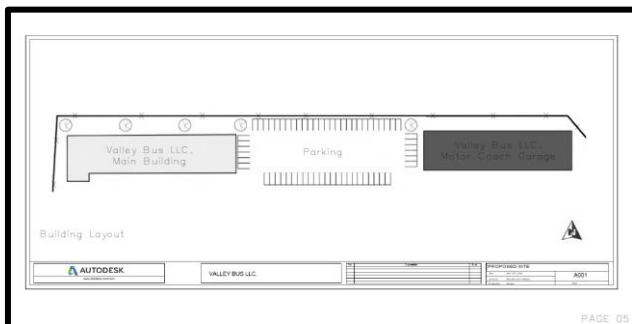
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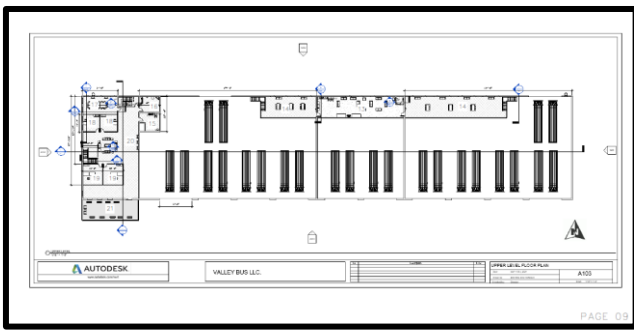
SITE ANALYSIS (cont.)

COLOR KEY ~

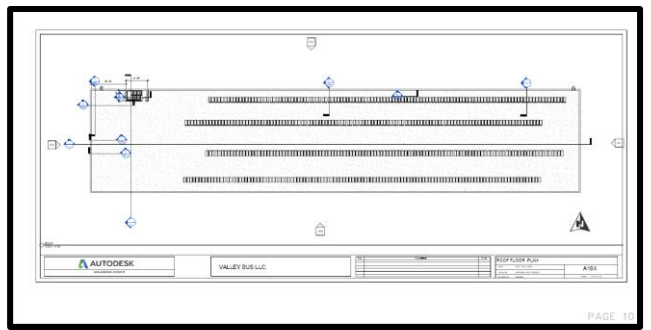
- NEW BUILDING
- EMPLOYEE PARKING
- COACH BUS GARAGE
- BUS PARKING
- LOT

PAGE 04

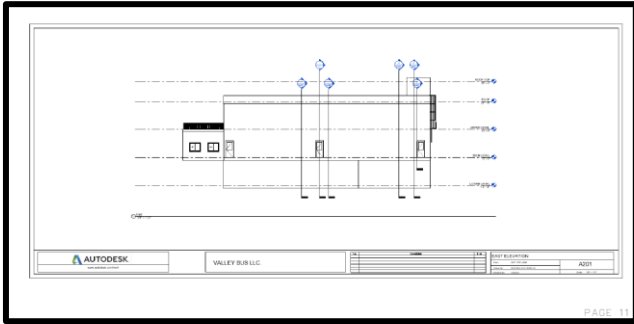




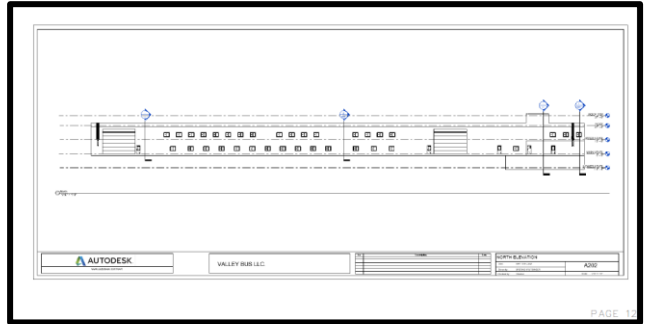
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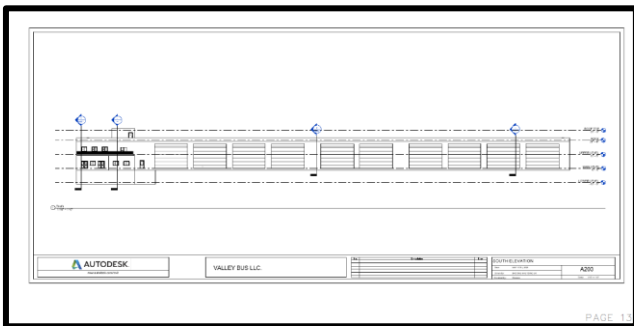
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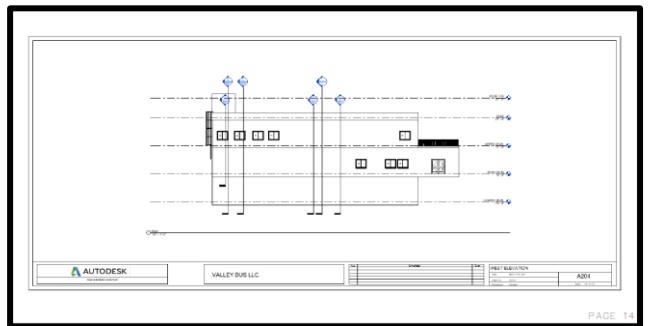
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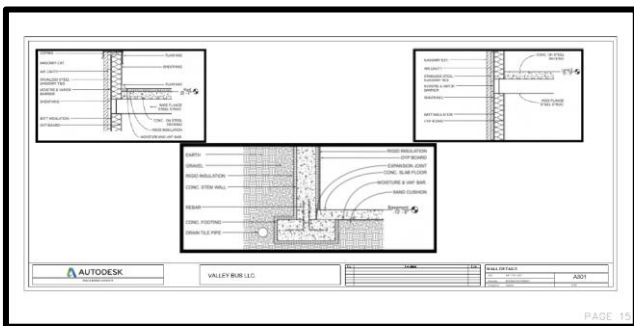
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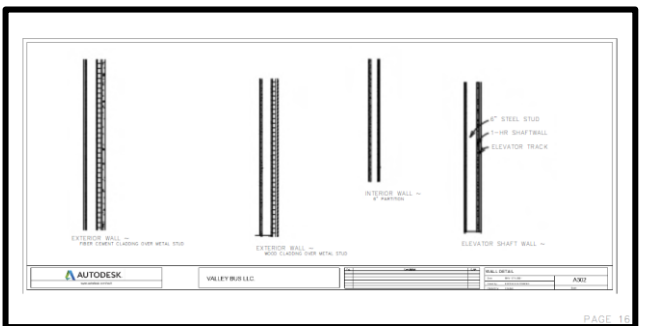
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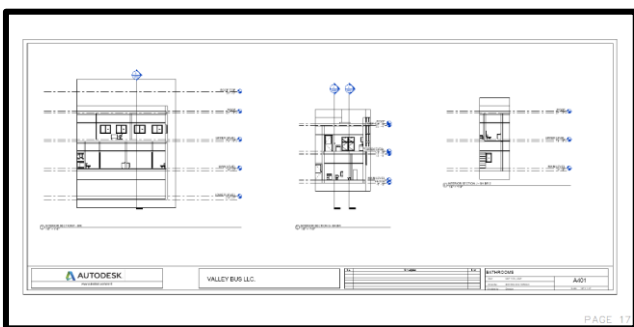
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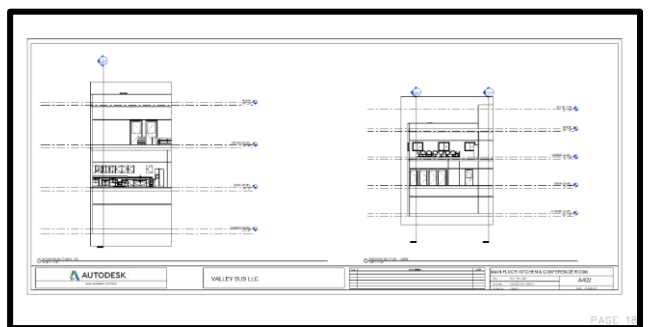
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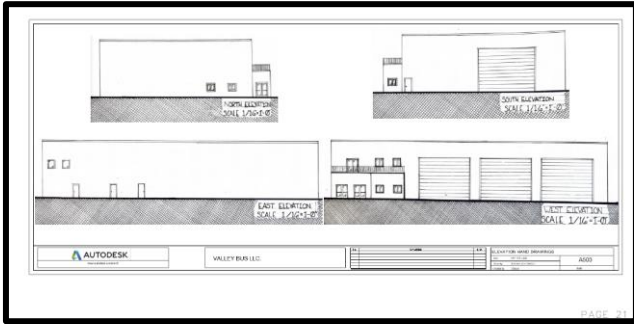
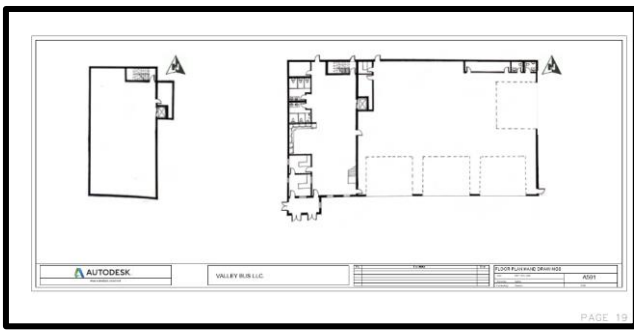
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LOWER LEVEL				UPPER LEVEL			
Level	Name	Number	Area	Level	Name	Number	Area
LOWER LEVEL	Mechanical	1	263 SF	MAIN LEVEL	Shop Offices (2)	11	155 SF
LOWER LEVEL	Storage	2	268 SF	MAIN LEVEL	Storage	12	171 SF
LOWER LEVEL	Open Space	3	9181 SF	UPPER LEVEL	Shop Breakroom	13	1558 SF
MAIN LEVEL	Bathroom (2)	4	268 SF	UPPER LEVEL	Shedding / Breakroom (2)	14	1510 SF
MAIN LEVEL	Breakroom	5	3431 SF	UPPER LEVEL	Kitchenette	15	277 SF
MAIN LEVEL	Kitchen	6	Redundant Room	UPPER LEVEL	Bathroom	16	274 SF
MAIN LEVEL	Office (2)	7	457 SF	UPPER LEVEL	Conference Room	17	558 SF
MAIN LEVEL	Entrance	8	560 SF	UPPER LEVEL	Office Space (2)	18	288 SF
MAIN LEVEL	Shop (2)	9	19426 SF	UPPER LEVEL	Office Space (2)	19	330 SF
MAIN LEVEL	Shop Storage (2)	10	1441 SF	UPPER LEVEL	Lobby	20	2181 SF
				UPPER LEVEL	Patio	21	Not Enclosed

AUTODESK VALLEY BUS LLC

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LOWER LEVEL				UPPER LEVEL			
Assembly Description	Height	Thickness	Level	Assembly Description	Height	Thickness	Level
10'0" CONCRETE SLAB	10'	12"	LL	10'0" CONCRETE SLAB	10'	12"	UL
8'0" CONCRETE SLAB	8'	12"	LL	8'0" CONCRETE SLAB	8'	12"	UL
6'0" CONCRETE SLAB	6'	12"	LL	6'0" CONCRETE SLAB	6'	12"	UL
4'0" CONCRETE SLAB	4'	12"	LL	4'0" CONCRETE SLAB	4'	12"	UL
2'0" CONCRETE SLAB	2'	12"	LL	2'0" CONCRETE SLAB	2'	12"	UL
1'0" CONCRETE SLAB	1'	12"	LL	1'0" CONCRETE SLAB	1'	12"	UL
8'0" CONCRETE WALL	8'	12"	LL	8'0" CONCRETE WALL	8'	12"	UL
6'0" CONCRETE WALL	6'	12"	LL	6'0" CONCRETE WALL	6'	12"	UL
4'0" CONCRETE WALL	4'	12"	LL	4'0" CONCRETE WALL	4'	12"	UL
2'0" CONCRETE WALL	2'	12"	LL	2'0" CONCRETE WALL	2'	12"	UL
1'0" CONCRETE WALL	1'	12"	LL	1'0" CONCRETE WALL	1'	12"	UL
8'0" CONCRETE COLUMN	8'	12"	LL	8'0" CONCRETE COLUMN	8'	12"	UL
6'0" CONCRETE COLUMN	6'	12"	LL	6'0" CONCRETE COLUMN	6'	12"	UL
4'0" CONCRETE COLUMN	4'	12"	LL	4'0" CONCRETE COLUMN	4'	12"	UL
2'0" CONCRETE COLUMN	2'	12"	LL	2'0" CONCRETE COLUMN	2'	12"	UL
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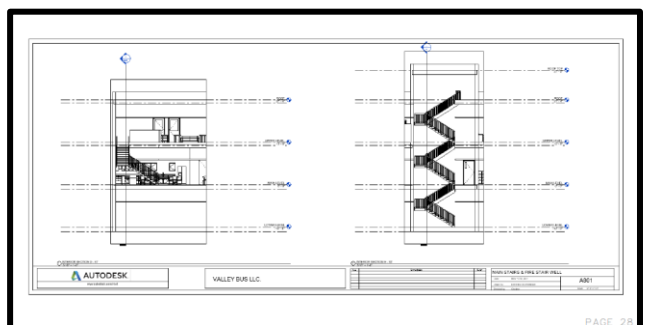
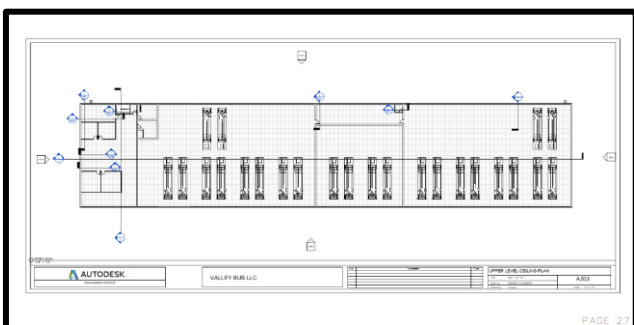
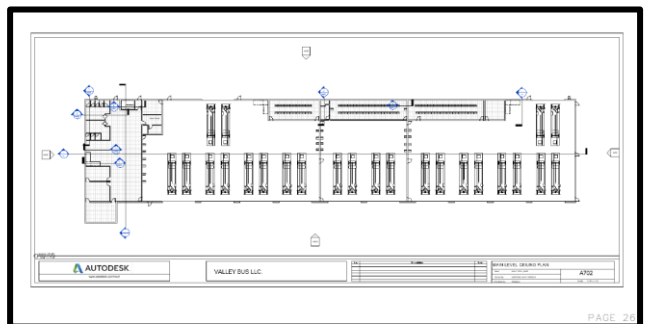
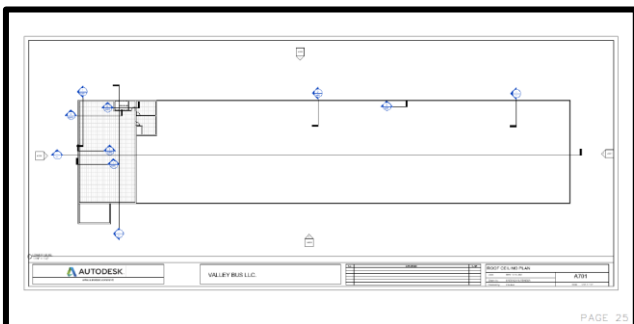
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LOWER LEVEL												UPPER LEVEL											
Level	Area	Perimeter	Volume	Level	Area	Perimeter	Volume	Level	Area	Perimeter	Volume	Level	Area	Perimeter	Volume								
LL	10000	1000	10000	UL	10000	1000	10000																
LL	20000	2000	20000	UL	20000	2000	20000																
LL	30000	3000	30000	UL	30000	3000	30000																
LL	40000	4000	40000	UL	40000	4000	40000																
LL	50000	5000	50000	UL	50000	5000	50000																
LL	60000	6000	60000	UL	60000	6000	60000																
LL	70000	7000	70000	UL	70000	7000	70000																
LL	80000	8000	80000	UL	80000	8000	80000																
LL	90000	9000	90000	UL	90000	9000	90000																
LL	100000	10000	100000	UL	100000	10000	100000																

AUTODESK VALLEY BUS LLC

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FALL 2021 – UMBR TOWER

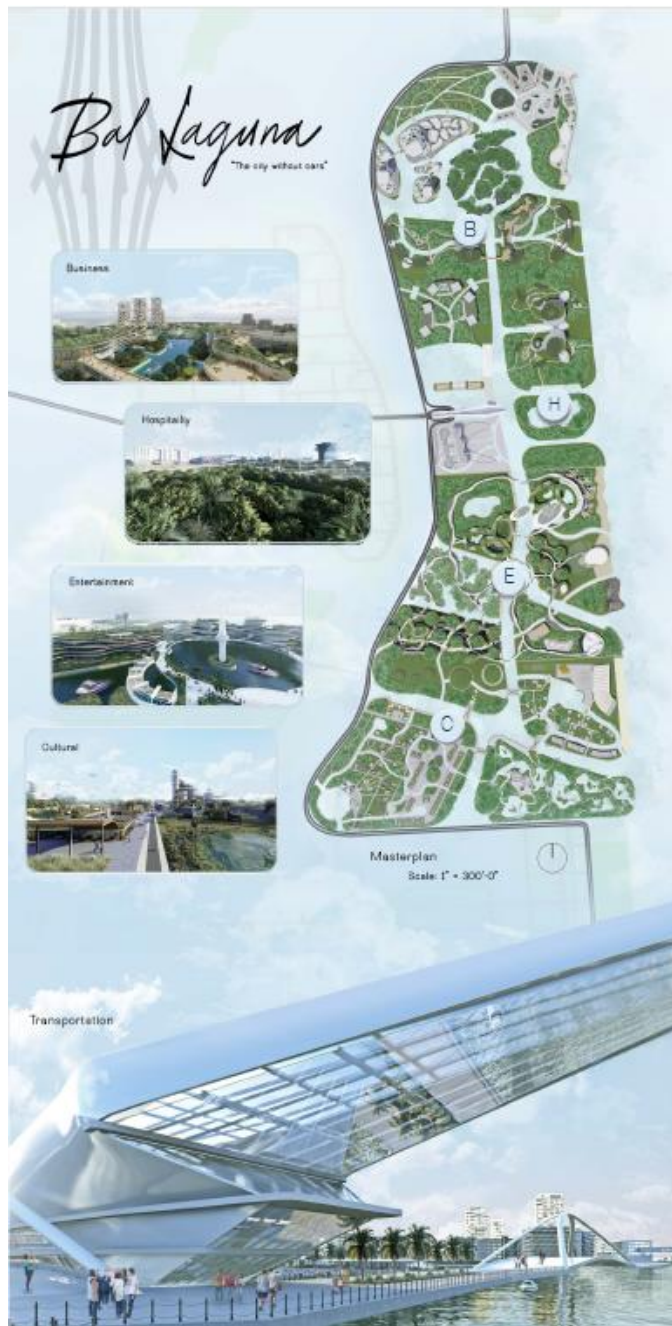
Final Model:

(Final presentation is on the website)



SPRING 2022 – BAL LAGUNA (Group Project)

Final Presentation:



<p>Project Leads</p> <ul style="list-style-type: none"> Robert Currie Ryan Dang Kenan Stoltenow 	<p>Video Production</p> <ul style="list-style-type: none"> Robert Currie Ryan Dang Kenan Stoltenow 	
<p>District Leads</p> <ul style="list-style-type: none"> Galus Arroyo Jessica Grones Brady Kowalzek Tucker Schoenfish Sydney Weigel 	<p>Board Production</p> <ul style="list-style-type: none"> Galus Arroyo Jacob Curtis Jessica Grones Brady Kowalzek Matthias Langley Sydney Weigel 	
<p>Designers</p> <ul style="list-style-type: none"> Litz Chamu Jacob Curtis Daniel Heckmann Luke Hoberg Brooke Krutinger Matthias Langley Cal Wigstrand 	<p>Administration</p> <ul style="list-style-type: none"> Ryan Dang Jessica Grones Kenan Stoltenow 	<p>Special Thanks</p> <ul style="list-style-type: none"> Amar Hussein Keith Merrill Abby Lee Miller

Other Project Titles – Presentations on Website

Fall 2019

Book Cover

Converging Studios

Pritzker

Spring 2020

Courtside Living

Fall 2020

The Native American Informational Center

Lifeguard Tower

Wildflower Park

Spring 2021

Same Day Surgery Clinic

Fall 2021

The Middle Lane

Spring 2022

Concrete Projects

Link: <https://0d1652d1-adfa-4085-b9dd-5ffa5bc4f411.godaddysites.com>