MONADNOCK REGIONAL SCHOOL DISTRICT

ELEMENTARY LEVEL DISTRICT WIDE FACILITY AND SPACE NEEDS ASSESSMENT STUDY

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PURPOSE AND ASSUMPTIONS

PURPOSE

The charge of this study is to analyze the building and space needs of the elementary schools of the Monadnock Regional School District and suggest alternatives with associated costs. These schools include the schools in the towns of Fitzwilliam, Gilsum, Swanzey and Troy. The intent is to create a comprehensive, broad picture analysis of the building for use in future planning. Further design and planning will be needed for developing the project and getting public approval. The report will simply provide the statement of need and basic data for beginning that work.

This report covers the school buildings in the Monadnock Regional School District including:

- Mt Caesar Elementary School
- Cutler Elementary School
- Dr. George S. Emerson Elementary School
- Gilsum STEAM Academy
- Troy Elementary School

Final decisions on building options will need to rely heavily on public input to fully understand opportunities and constraints that face this district.

ASSUMPTIONS

Existing Conditions

The buildings were visited at various times throughout 2019. Original drawings documenting a large part of the existing buildings were obtained. Actual dimensions were not verified due to the volume of space studied. Inaccuracies were noticed in some drawings, but these issues do not affect the outcome of the study. Verification of existing conditions should be part of any final plan.

Building and Life Safety Codes and Department of Education Rules

The work outlined is based on the following codes; The 2015 NFPA 101 Life Safety Code, The State Building Code (2015 International Building Code, 2015 International Existing Building Code, 2015 Mechanical Code, 2017 National Electric Code, and others), The State Energy Code and The State Barrier Free Access Code. Because of

the generalized scope of the study it is not possible to list every possible item that falls within these codes. It is assumed that any areas impacted by proposed changes would have all code issues resolved.

There is often a misconception that code compliance problems are "grandfathered" if they have existed for a long time. The State of NH Department of Education Administrative Rules (ED 306.07) requires all approved schools to meet NFPA 101 Life Safety Code as well as other codes. Other codes such as the State of NH Fire Code and the State of NH Building Code refer to this code as well thus giving local code enforcement officers the authority to require upgrades regardless of how long the situation has existed. However, it happens quite often that review for compliance is not done until a major construction project is proposed.

Chapter 15 of NFPA 101 is specifically designed for existing educational facilities. We suggest that the local authorities as well as the State Fire Marshal's office be invited to walk through the building and review this study to ensure that the District fully understands what is required.

Enrollment Projections

Understanding anticipated enrollments is the first step in understanding the function of a school facility. As important to the calculations as the total number of students are the individual class sizes. It is possible for a school facility to reach maximum capacity long before the stated capacity if one year's enrollment is much larger than others. One large cohort of students will put stress on the core facilities as if the entire school where much larger. It is therefore important to design the core facilities for a larger number of students than simply the anticipated total.

This report includes enrollment projections based on data provided by the District. Actual enrollments can be significantly different and should be monitored each year. The projections are a tool for identifying trends that are useful in determining design parameters.

Program Data

It is important to analyze the building usage in order to determine areas that might require changes to improve the function of the building. The first step in identifying space needs is to develop the program or a list of spaces and their correlating size. To do this we rely on several sources including; NH Department of Education Standards, Association for Learning Environments (formerly; Council for Educational Facility Planners Inc.), other State Standards, examples of other similar projects and our own experience.

We also, possibly more importantly, rely on the Owner to supply us information for their programs. This was collected by interviewing the Principal and by analyzing how the building is currently used. This data includes; enrollment per course, periods per day, meetings per week and other information. Changes in this data would therefore change the results in this report.

It is also important to note that we did not always use the "minimum" standards when analyzing the data. Class size in particular can greatly affect the space needs of a

school. Current trends are to limit class sizes. For this study we used numbers that were neither the absolute maximum nor minimum but rather, closely match the average for schools in the state of NH.

Costs

There are several sources that we rely on for cost data. RS Means is a construction cost index that helps establish a range of costs. Other similar projects are also used. For a report with this broad a scope, however, it is not possible to produce accurate estimates due to the level of detail. Also that cost data is almost immediately outdated due to inflation. We have prepared this report based on an average cost per square foot per task. This will give us an "Order of Magnitude" estimate on cost for determining budgets.

New construction costs are based on the NH Department of Education cost per square foot maximum cap. This helps establish the benchmark for the limit any project generated from this report needs to meet. It is not meant as a final construction estimate.

All costs are given in "today's numbers". Inflation for building materials is very difficult to forecast. At the time of this report, many resources are seeing increased inflation. The costs in this study will need to be verified before proceeding with a construction project.

Expectations

As with any renovation project there are areas that will be left undone. It is not economically feasible to upgrade every aspect of an older building to meet the same criteria of new construction. It is important to set limits on expectations to avoid an endless amount of project growth.

BUILDING NEEDS ANALYSIS

This section studies the existing facility for deficiencies relating to the building or property. Most data were obtained from previous studies and additional data was generated from site visits, interview with staff and extracted from original drawings.

Overall, the district schools have some similar traits. All have had multiple additions over the decades. This has created floor plans that developed very organically and not with long-term planning in mind. There are many awkward or poorly utilized spaces that lowers the overall building efficiency. Many spaces have been repurposed from the original intent but not with the greatest success. This functional obsolescence is typical in any older educational facility but is particularly severe here.

Security in schools is currently a very hot topic. Since Columbine we have been designing schools to be more secure. Before Columbine there was little worry about the public accessing school facilities, but we have since learned that this is a substantial problem. Although we plan for the worst-case event with a shooter entering the building, there are many smaller instances of security breaches in schools that do not become headline news but are still very important to prepare for. All schools should have a secure entrance with a direct connection to the main office. Few of the schools in the MRSD have this in place.

Many of the schools have many exit doors. These were probably installed for life safety purposes but over the years many are not used or no longer have proper hardware or exit discharge to be used as such. The effect is no perceptible increase in life safety but a significant decline in security since each exit also represents a possible point of entry. This reviewer found at least one instance of a door left unlocked after school hours.

It is worth noting that all the district facilities are clean and well maintained. The staff obviously put pride into the buildings, and this helps with the value of education provided. This intent of this report however is to point out the deficiencies and this should not be misconstrued with criticism of the staff.

Mt Caesar has recently gone through a renovation/addition project. Although some deficiencies remain, overall this school is the closest to an acceptable level of condition and will be used by this study as the standard by which all facilities will be graded. All the schools are fully sprinklered which is very important and helps with many code issues.

Items identified are cataloged with costs listed by priority. High priority items are those that need to be done within the next two years. They include issues such as code deficiencies or maintenance items that could cause damage if left undone. Medium priority items should be completed within five to ten years. They are important but do not pose an immediate need. Low priority items are worth considering due to cost savings or improved efficiency. They could be done at any time and often can be done more cost effectively if combined within a larger project.

CUTLER

General Observations

Cutler Elementary School is typical of the elementary schools in the Monadnock Regional District. The original building is an older, small wood framed schoolhouse and over the decades has received multiple additions with the original now just a small part of the overall school and no longer the focus point. The complex is sprawling and at times feels disjointed. The front entrance is not the obvious original front entrance but rather a very understated doorway on the side alley. The gymnasium has its own entrance along that alley. The entrance door between the portable classrooms is the most accessible entrance but this is the furthest from any administrative space.

Site and Exterior

Cutler sits on a very small piece of property but utilizes adjoining town land. The building is tight to property lines on two sides making an addition difficult. The typography is flat. The drop-off/pick-up for cars and buses are not well laid out. The driveway for the buses is narrow and has resulted in buses having collided with the building. The driveway for the cars is short and provides little queuing space and blocks parking spaces when in use.

The exterior has numerous needs. The fire escape stairs do not meet code for exit discharge. The last addition has a significant amount of mold on the split-faced concrete block. This is caused by moisture. The source of this should be investigated and the mold cleaned. Many of the windows need replacement.

Most of the exterior masonry joints need to be resealed. Some appear to have opened up meaning there could be movement in the wall. This does not appear to be structural but should be monitored.

Building and Life Safety Code

The original building with the early 3-story addition does not meet code in several ways. The top floor does not have a valid second means of egress. The fire escape stair, while possibly to code when installed, is old and not to current standards. The stair that serves this floor has breaches in the fire rating and discharges back into the building, not to the exterior. The corridors need to be resistant to the passage of smoke and the stair needs to be fire rated. Some doors have holes that compromise this.

The handicap accessibility is provided by a stair lift which is a hazard for egress and not a proper means of supplying accessibility. There are numerous exterior doors that at one time were provided for egress but that no longer function well or safe per current standards.

The building is essentially three separate buildings for code review; the original with the early 3-story additions, the 1-story classroom and gymnasium addition and the 2 portable classrooms. The portable classrooms, although meeting code, are not the same quality as the other two buildings and should probably be removed.

The toilet facilities are largely not code compliant and do not provide an adequate number of fixtures to meet building code. The main problem with quantity being the lack of fixtures for assembly in the gymnasium.

Indoor Environmental Quality

The ventilation is primarily delivered through unit ventilators. This type of system was common when the building was first constructed but is no longer considered appropriate for schools due to noise and inefficiency. An entirely new system is recommended.

The control system for the heating and cooling is mostly archaic. It does not allow for effective monitoring and control. A new digitally controlled system would allow for more efficient operation of the systems and produce data that can be used to trouble-shoot problems. There is just limited air conditioning for the facility.

Many of the light fixtures are due to be replaced. This would also give the opportunity to install much more efficient and better-quality lighting such as indirect dimmable LED's.

Interior Finishes

The interior finishes are in various stages of wear with most needing some attention. The flooring needs to be replaced in large areas of the building. The walls are drywall and show wear. The ceilings are mostly drywall with mechanical and electrical systems exposed. The ceilings that are suspended ceilings have fiberglass tiles which are residential in quality and show wear.

Security and Safety

The main entrance does not have a secure vestibule. Rearranging of the administrative offices to get the reception connected to the entrance should be considered. The gym can be locked off for public use but an even more secure arrangement should be considered.

EMERSON

General Observations

Emerson Elementary School is typical of the elementary schools in the Monadnock Regional District. The original building is an older, small wood framed schoolhouse. Over the decades it has received multiple additions and now the original is a small part of the overall school and no longer the focus point. The community shows strong support for the school and it is well maintained. Many of the components however are showing serious wear and age.

Site and Exterior

Emerson sits on 16 acres of land and has generous space for buildings, driveways and play areas. The typography is gently sloped. The current layout for car and bus drop-off/pick-up seems to work but could be improved.

Because of the various ages of the building there are various needs depending on the area in question. On the exterior there is a need for new windows and new roofs in certain areas.

Building and Life Safety Code

The facility is mostly up to current codes however there are some areas in need of improvement. The original building does not meet several aspects of the code. The lower level has several deficiencies. This area is relatively small and a better solution to upgrading this area might be to relocate the programs housed there to a code compliant section of the building.

The building is mostly wood framed and structurally in reasonable shape. The structure was not designed and built under today's codes, therefore may not meet many current code requirements. The buildings however do not show significant deflection or failure therefore do not require immediate repair. However, if a major addition were to be contemplated, the existing buildings would need to be analyzed for any changes in load that it might receive.

The toilet facilities are largely not code compliant and do not provide an adequate number of fixtures to meet building code. Renovating and possibly expanding the toilet facilities is recommended.

Indoor Environmental Quality

The ventilation is primarily delivered through unit ventilators. Some have been replaced but many are original. This type of system was common when the building was first constructed but is no longer considered appropriate for schools due to noise and inefficiency.

The control system for the heating and cooling is mostly archaic. It does not allow for effective monitoring and control. A new digitally controlled system would allow for more efficient operation of the systems and produce data that can be used to trouble-shoot problems. There is just limited air conditioning for the facility.

Many of the light fixtures have received recent upgrades, however this technology is rapidly changing, and further upgrades could be warranted. This would also give the opportunity to install much more efficient and better-quality lighting such as indirect dimmable LED's.

The intercom system is relatively new. It may be worth considering an integrating the system with the other elementary schools.

Interior Finishes

The interior finishes are in various stages of wear with most needing some attention. The ceilings in the older parts of the building are in poor shape and need to be replaced. Some areas of the 1970's wing should receive new floor tile. The doors in the older parts of the building are delaminating and starting to splinter. Some rooms should receive additional cabinetry.

Security and Safety

The main entrance does not have a secure vestibule. Rearranging of the administrative offices to get the reception connected to the entrance should be considered. The gym can be locked off for public use, but an even more secure arrangement should be considered.

GILSUM

General Observations

Gilsum STEAM Academy has a somewhat unique design compared with the rest of the schools in the district. First, it is the smallest with the smallest enrollment. Secondly, the gymnasium and cafeteria is considered the town community center. The design of the community center is attractive, but the arrangement and the existence of a courtyard poses challenges.

Site and Exterior

The site provides enough space for parking and play areas. It has areas of steep slopes and does not allow for access around the entire facility. There is no separation of car and bus traffic. The exterior of the building has some wear, but general maintenance will take care of most of the problems. The courtyard can be an attractive area but also a nuisance for maintenance, snow removal and the inevitable removal of the oil tank. Probably most importantly, the main entrance to the school is inside the courtyard with the main entrance for the community center closer to the parking.

Building and Life Safety Code

The facility has a few issues with code. The kindergarten classroom is over 1,000 square feet and therefore is required to have two separate means of egress. Due to the slope of the grade outside the classroom it is not feasible to have an exterior exit door. There is an interior door to the adjoining classroom, but the intervening room exit is not remote from the kindergarten exit making that door non-compliant. Otherwise, the schools small size helps to evacuate the occupants quickly.

The building is mostly wood framed and structurally in reasonable shape. The structure was not designed and built under today's codes, therefore may not meet many current code requirements. The buildings however do not show significant deflection or failure therefore do not require immediate repair. However, if a major addition were to be contemplated, the existing buildings would need to be analyzed for any changes in load that it might receive.

The toilet facilities are not all code compliant and do not provide an adequate number of fixtures to meet building code. The toilet facilities for the assembly space are undersized but do meet ADA. The main gang toilets are not handicap accessible. Renovating and possibly expanding the toilet facilities is recommended.

Indoor Environmental Quality

The ventilation is primarily delivered through unit ventilators that existing in most classroom. Some have been replaced but many are original. This type of system was common when the building was first constructed but is no longer considered appropriate for schools due to noise and inefficiency.

The control system for the heating and cooling is mostly archaic. It does not allow for effective monitoring and control. A new digitally controlled system would allow for more efficient operation of the systems and produce data that can be used to trouble-shoot problems. There is just limited air conditioning for the facility.

The light fixtures are largely fluorescents and an upgrade to LED's would save on energy. Additionally, LED's can be dimmable and provide much better-quality lighting than fluorescent or incandescent lights.

The intercom system is archaic and should be replaced. It may be worth considering an integrated system with the other elementary schools.

Interior Finishes

The interior finishes are in various stages of wear with most needing some attention. The ceilings throughout everywhere but the community center need to be replaced. There is a possibility of floor tiles containing asbestos to exist in the building. This should be abated, and the flooring replaced.

Security and Safety

The main entrance is deep inside the courtyard and not visible from the parking lot. Most visitors probably use the entrance to the community center which means that by the time they reach the main office they have mixed with students. A means of getting visitors to enter directly into the main office should be implemented.

MT CAESAR

General Observations

Mt Caesar has had recent renovations and additions and therefore is the most up-to-date facility with the fewest issues. That said, there are some needs to be addressed.

Site and Exterior

The site is the largest of all the elementary schools in the district. It is located near the Middle/High School and SAU. The typography is flat with ample room for expansion. The driveways and parking are being studied for improvement.

Building and Life Safety Code

There are a few small code issues. One kindergarten classroom and the preschool classrooms are over 1,000 square feet and required a second means of egress. There is an interior door to the adjoining classrooms, but the intervening room exit is not remote

from making that door non-compliant. One classroom lacks the proper width for its entrance door.

The toilet facilities are not all code compliant and although there appears to be close to the necessary quantity of fixtures, there is not enough for assembly use. Since the cafeteria is not a true assembly space this might not be a large problem. Toilet facilities for the lower grades, particularly the kindergarten is recommended.

Indoor Environmental Quality

The entire ventilation system has been recently upgraded and performing well. Lighting is likewise all new.

Interior Finishes

The interior finishes are mostly new. There are some remaining areas that have not been fully renovated.

Security and Safety

The main office is remote from the main entrance. This is a serious problem that should be addressed.

TROY

General Observations

Troy has had the fewest in additions and renovations and in some ways has benefited from this but in many other tends to suffer. The positive is that the layout is close to the original design intent, but the negative is that many issues that have developed over time are left unaddressed.

Site and Exterior

The site is large in acreage but only a small portion is usable. The topography immediately around and to the west is relatively flat and open but at the edge of the pavement the land slopes dramatically away. This leaves little opportunity for expansion. The original building is 3-stories which keeps the footprint relatively small for the amount of space and helps with site issues. There is a separate bus drop-off/pick-up area, but car pick-up\drop-off is less well defined.

The main entrance is not easily identifiable and not secure.

The superstructure is in relatively good shape for the age but many less durable components such as the roof, windows and doors need replacement.

Building and Life Safety Code

The facility has a numerous code issues. The original building has two stairs connected which was typical for the vintage construction. These were often design for separating boys and girls and not meant for separate egress. Current code requires that every level

must have legitimate fire rated exits and these stairs do not provide that. Some rooms have their own exit to the exterior but some, particularly on the upper levels are suspect on how safe they are.

Kindergarten and 1st Grade are limited to Levels of Exit Discharge unless the space is provided its own dedicated exit. This includes special education or core facilities where there is more than one student per teacher. Some rooms do not meet this.

The building is masonry bearing walls with wood framing. It was good quality at the time of construction but is unlikely to meet current structural code for issues such as seismic loads.

The building is not fully handicap accessible. The main entrance has stairs and there are multiple stairs and ramps inside the building. There is a stair lift to some spaces but not elevator. The toilet facilities are not handicap accessible.

Indoor Environmental Quality

The ventilation is archaic and in need of replacement. The control system for the heating and cooling is archaic if almost non-existent. This does not allow for effective monitoring and control. A new digitally controlled system would allow for more efficient operation of the systems and produce data that can be used to trouble-shoot problems. There is just limited air conditioning for the facility.

The light fixtures are older and inefficient. Upgrading to dimmable LED's would provide more energy efficient and much better-quality lighting.

The intercom system is archaic and should be replaced. It may be worth considering an integrated system with the other elementary schools.

Interior Finishes

The interior finishes are mostly in need of replacement. The ceilings throughout the facility but most notably in the gymnasium need to be replaced. Some walls are still lath and plaster and should be replaced. Other issues include bringing the casework and equipment up to district standards.

Security and Safety

The main entrance is not secure. Although there is an office near the entry door, visitors have access to the school once through the main doors. The location does not provide good visibility to the staff of visitors approaching the building.

PROGRAM ANALYSIS

Programs have changed over the years and older buildings can become inefficient without modifications. Additions often exacerbate the problem by prohibiting building components from functioning the way they were originally meant.

The elementary schools in the Monadnock Regional School District are a good example of this. All the facilities have had numerous additions, and these have created some awkward spaces. Many rooms have been cooped from a previous use to a new use as the education style has changed. Many newer problems in schools such as safety and security have resulted in the improper placement of building elements such as a secure front entrance and main office.

Enrollment Projections

The first step in preparing space needs recommendations is to determine the number of students the building will be designed to serve. Enrollments are predicted in this report using a nomothetic calculation or an estimate based on probability. For this study we used a cohort survival enrollment projection. Historic enrollments and births are used to calculate the likelihood of future students moving in or out of the district. Figures are calculated using a 5-year average, 3-year weighted average and simple projection. Creating projections beyond what is available for data is unreliable. Therefore only 5 years worth of enrollments are reliable for the elementary school level which reflects the available birth data.

The difficulty in preparing enrollment projections is determining probable future enrollments for kindergarten. Once that is established tracking the progression of students through the grades is more set. Many school districts throughout New Hampshire have experienced a drop in enrollments due to low birth rates. Demographics show that Millennials are now the largest living generation. Millennials are having fewer children and having them later in life. They are just reaching the age where their children are starting to attend school. This means that there could be a flattening of the decline seen in recent years and possibly a slow incline in enrollments starting soon and into the foreseeable future.

Economic factors also play an important role in enrollments. The towns that make up the Monadnock Regional School District have a lower median income that the average town in New Hampshire. This may make the area attractive for residence looking for low-cost housing but can drive away upwardly mobile young professionals looking for quality schools. This is demonstrated by a sharp decline in historic enrollments in the 3rd and 4th Grades. This hits Swanzey and Fitzwilliam relatively hard.

Another difficulty in preparing enrollment projections is the small class size per school. A small deviation in the data can cause a large and inaccurate deviation in the results. This shows most in Gilsum where the class sizes are the smallest.

For the purposes of this study the design capacity of each school will be set as the current enrollments indicate with some adjustment for possible spikes in the future. The enrollments and birth rates should be closely monitored for changes. For now the projections show a decline for the foreseeable future therefore additional capacity is not warranted.

Capacity Calculations

Once a target capacity is determined using the enrollment projections the number of teaching stations is calculated (Table E – Curriculum Worksheet). The target capacity is represented by two numbers: the design capacity and the core capacity.

The design capacity is defined as the number of students that the building design will accommodate and function normally. The design capacity uses the average amount of students in each of the classrooms to generate an overall picture of the functionality of the school. It is possible that the school could exceed the designated design capacity but with every additional student there would be some decrease in the quality of education.

The core capacity is defined as the number of students that the core areas of the building will accommodate and function normally even with peak years and future growth factored in. The core areas are further defined as the spaces that all students in all the grades use to some degree. They include the gymnasium, library, main office, cafeteria, and other similar areas. These areas need to be designed to accommodate the peak number of students possible in any one particular grade or grouping. The effect is that the core capacity needs to be a higher amount than the design capacity to handle anomalies that invariably occur in enrollments.

The design capacity is divided into groups representing individual grades and/or by curriculum depending on grade level. The average class size, the number of meetings per week and a utilization rate all factor into the total number of rooms required. From this data a core capacity is established using a maximum room capacity multiplied by the number of teaching stations.

The utilization rate represents unutilized space that is necessary to schedule activities and otherwise allow a school to function smoothly. Utilization rates at elementary schools can be as high as 90% while at middle and high schools where students change class throughout the day the utilization rates are usually as low as 85% or 75%.

Space Needs

The Space Needs Worksheets (Table F) utilized the capacity calculations to create a program of space required for each building. The number of teaching stations is multiplied by the required space for each. The net of the program areas is multiplied by a factor that represents non-program space such as corridors, toilet rooms, thickness of walls, and other miscellaneous areas.

This creates a snapshot of the school if that school were to be built new. This is compared to the actual spaces. Program deficiencies and inadequacies in space need can then be identified.

General Observations

Each elementary school in the Monadnock Regional School District is somewhat unique in how the program is worked out in its facility. All have become somewhat sprawling in the layout which can have adverse effects on security, supervision, ergonomics and collaboration. The classrooms themselves are different sizes and

shapes with many not meeting the NH Department of Education standards. These variations can create situations where one student's experience is very different from one school to the next or even from one classroom to the next.

Some schools practice multi-age classrooms to be able to better utilize available space. This standard however is not universally practiced, even within the same school. This seems to be driven from a space-needs pressure, not driven by education quality.

Swanzey students are shared between Mt Caesar (PK-2) and Cutler (3-6). These two are the only two schools in the district that do that. This helps with leveling the class size but also means that students that attend here have an extra transition than other towns. This may help to explain the large drop in enrollments in Swanzey for grade 3 and grade 4.

The library appears to be almost an afterthought in all the schools. Libraries have changed in the last few decades and now rely more on technology than they have in the past. Even such, libraries perform an important role of being a hub for the school they serve. This does not seem to exist in the Monadnock Regional School District.

The challenge here is to provide a means of leveling the design of each school to standard that allows a reasonably equal quality of education to every student.

CUTLER

General Observations

Cutler is a good example of an organically developed floor plan that has lost good planning. Core facilities are spread throughout the building making access and supervision less efficient. The library is in the basement area and not easily utilized after hours. The principal is not connected with the main office. Special Education is largely also in the basement which does not work well with inclusion.

Educational Space

Most regular classrooms are adequate in size but do range from a low of 650 square feet to just about 900 square feet. Art and Music share a space that is 830 square feet which is small for that program.

Core Space

Core spaces are reasonably adequate in size for the design capacity but again, are not well organized.

EMERSON

General Observations

Emerson likewise developed very organically. The main office suite is at one end of the building, near but not directly connected with the main entrance. Many of the corridors have spaces only on one side meaning corridors are longer and take up more space than a typical school.

Educational Space

Most regular classrooms are adequate and uniform in size close to the 900 square foot target.

Core Space

Core spaces are reasonably adequate in size with the library the one exception. The library is in a below-grade space in the original building. This is not very appropriate because it does not give good access to students.

GILSUM

General Observations

Gilsum is the smallest school in the district but has received many additions over the years. The main office suite is in the central part of the building, which is good for supervision, but it is not directly connected with the main entrance which is bad for security.

Educational Space

The classrooms vary in size but are on average quite large. They are also multi-age classrooms, so the extra size is important. The number of classroom work for the current enrollments but would not work at a higher capacity.

Core Space

The gymnasium and cafeteria are large for the design capacity and it is odd that this school, which is the smallest in the district, is the only school with both. The library and offices are small.

MT CAESAR

General Observations

Mt Caesar is the school that has had the most attention for renovations and additions but is no better organized in terms of program.

Educational Space

The Kindergarten classrooms vary in size from 1023 square feet down to 633 square feet which is considerably lower than the NH Department of Education standard of 1,000 square feet. Regular classrooms vary less with the average just about at the state recommendation of 900 square feet. This the only school with separate art and music.

Core Space

There does not exist a true gymnasium here. The multi-purpose room is too small for physical education and serves primarily as a cafeteria. Administration is close to the center of the building but is separated from the main entrance by the boiler room. The

library is in a former classroom and is located in the center of one of the classroom wings.

TROY

General Observations

Troy has most of the program spaces in the original 1890's schoolhouse. This model worked well at the time and can work well again but currently has some challenges. The addition is not well integrated into the original building making communication between the space awkward.

Educational Space

The classrooms are small. Another problem seems to be adjacencies. The preschool is in a small classroom and adjacent to the 1st Grade classroom which is remote from the other 1st Grade rooms.

Core Space

The core facilities appear to be adequate in size with notable exceptions being the kitchen o and the library. Again, another problem is adjacencies with spaces such as the nurse not being centrally located.

CONCLUSIONS

PLANNING

There are questions to consider that involves much more than "How many students?" and "How much will it cost?". Each community needs to consider the benefits and concessions of future plans. Core at this is the question of "Neighborhood Schools vs. Consolidation". There are benefits and concessions to each and there is not clear answer.

OPTIONS

Each of the three options presented should be considered carefully. All three have very different cost implications but all three also provide radically different outcome quality.

Option 1 – Do Nothing. This is not recommended because the current situation is not sustainable

Option 2 – Additions and Renovations over 5+ years. This is not recommended due to the high cost, difficulty in performing the work and low-quality return.

Option 3 – Additions and Renovations in One Year. This is worth considering in that it allows for a more efficient delivery of construction than Option 2 and is much less expensive due to efficiency of scale and lack of inflation. It however does not solve all the issues and has the greatest negative impact on education during construction.

Option 4 – New South Elementary School, Additions and Renovations Elsewhere. This solves the problem for the major parts of the community. It is relatively cost effective. It does not solve the problem at Cutler which is the school with the most difficult challenge in renovations.

Option 5 – New South Elementary School, Additions and Renovations at Mt Caesar to create a North Elementary School. This solves the problem for most of the community. It is relatively cost effective.

Option 6 – Consolidate onto One Site. This is not recommended for two reasons: The size and the loss of community schools. Consolidation would reduce operating costs but would put a transportation burden on many families in the district.

Option 7 – Consolidate Across Town Borders. This would create a North and South and possibly a third Elementary School that are not restricted to town lines. This could allow for locations that are dictated by demographics, not political boundaries.

End Report

APENDIX

RECOMMENDATIONS

DETAILED OPTIONS COMPARISONS

The Monadnock Regional School District is a diverse and sprawling school district. Finding a solution to the building issues that satisfies all is difficult. These options are meant to show a logical thought process that explores the possibilities. The final recommendation is the option that in this writer's opinion best addresses the needs at a reasonable cost.

The eight options are meant to show a natural progression of thought from the current situation through conclusions that offer a range of possibilities. Each option is reviewed for their positive and negative aspects and the cost differences. It is well understood that the District is unlikely to support any construction project that does not make financial sense. This process is intended to evaluate each option fairly and completely using the best data available at the time.

Core to the cost evaluation are the construction cost estimates and the Life-Cycle Cost Analysis worksheets. The construction cost estimates include both Hard and Soft costs to ensure complete and reasonable estimate. Hard costs are based on the NH State Department of Education FY 2020 Maximum Allowable Costs for School Construction of $182 per square foot for an elementary school in Cheshire County. This is then modified by 10% to account for inflation for two years. The result is a cost for construction of $200 per square foot. Other Hard costs are the site development and earthwork. These are much more difficult to estimate. What has been used is reasonable estimate based on this writer's experience.

The Life-Cycle costs are a combination of Building Needs, Utilities, Human Resources and Financial costs. Many of these numbers are estimates but as much as possible these are researched and reasonable if not conservative. They are applied fairly across options so that if there is a mistake, it is unlikely that it would cause a change in the outcome.

The Building Needs and Utilities are relatively easy to explain. The Building Needs are the issues identified in the Building Needs Assessment Study. The Utilities are the current and projected costs for heating and electricity. Mt Caesar has recently gone through heating and electrical renovations, so there is data to show what the cost difference would be if other schools also went through similar renovations. For new construction is there is data from other districts or regional and national indexes.

The costs for Human Resources are more difficult to predict but is rooted in studies and common sense. The concept is that an existing, older, poorly designed facilities with less quality materials will be less efficient for the staff and less productive for students. For an example; a new school with new and more durable materials will take less time to clean than an older school. Another example; teachers and students that work in a classroom that is well-lit, well ventilated with a comfortable temperature, will be more productive and less likely to be out sick. The savings for not having as many substitute teachers can be calculated.

The Financial costs refer to the cost of financing a bond but also includes the value of existing buildings that could be included in the tax base. The cost of the bond comes in two parts; the principal payment and the interest. Most bonds are level principal so the interest payments actually decline over time. In 10 years the interest would be half of the first year's payment on a 20-year bond. In some options where there is consolidation of schools, the existing building is assumed to be repurposed and therefore gives value that offsets some of the costs. For the analysis the value of the sale of the property is not calculated but the potential property tax revenue is. Very conservative values of roughly $30 per square foot are used.

The Life-Cycle cost projections are limited to 10 years. After more than 10 years it becomes increasingly difficult to predict building upgrade needs. This is when even new construction would start to need regular maintenance. A 10-year horizon does not cover the entire bond repayment which typically is 20 years, however after 10 years the bond payments are considerably less and also the population and valuation will have likely changed. New residents 10 years out will share the cost of the bond and it is likely property values will increase and negate some of the tax impact. The differences of the different options after 10 years is impossible to predict and possibly not significant.

Demographics should also influence the selection of the recommended option. Swanzey represents fully half of the districts population and therefor is the gravitational center of the district. The Middle School and the High School are located here. Fitzwilliam and Troy each represent about 16% of the population and Richmond 8% with these three towns together representing about 40% of the population.

Troy's town center is the most densely populated region. Swanzey is made up of several villages including East Swanzey and the largest, West Swanzey. The Middle School, High School and Mt Caesar Elementary are located between these villages about 3 miles from each center.

Lastly, inflation is added to all the numbers with a factor of 2.5% per year. Overall the district has seen an increase in energy costs by approximately 10 % a year for the last four years. Energy performance will have an even larger impact if energy costs continue to rise. Bond interest rates have averaged around 2.5% per year. There is no guarantee that bond rates will stay low but there is little indication in the market that they are going up any time soon. With inflation and energy costs rising at the rate higher than inflation, there is a great incentive to borrow money for needed improvements.

The success of any option is likely tied to receiving State Building Aid. The rate for the Monadnock Regional School District is currently 54% which is paid up-front thus reducing the need for a bond. There are some restrictions and it is possible that some options would receive less aid or even risk not being funded at all. The State Department of Education is encouraging the implementation of certain factors including; consolidation, solving life safety problems, energy efficiency, reuse of historic structures and other items. Options that contain the most of these factors are more likely to receive Building Aid.

OPTIONS

The options start with the simplest of scenarios and increase in complexity and explores alternatives.

Option 1 - Do Nothing

This option is literally what happens if the schools are left exactly the way they are. This is obviously not a viable option because it does nothing to solve the problems identified in the schools. What is important however is to note that "doing nothing" actually has a cost. The schools will cost more to heat, staff will spend more time cleaning and maintaining the buildings and teachers and students will be less productive. These added costs can be estimated and should be used as a benchmark when comparing to other options.

BUILDING PROJECT COST	=	**$0**
STATE BUILDING AID	=	**$0**
BOND AMOUNT	=	**$0**
LIFE -CYCLE, 10YR COSTS	=	**$19,036,920**

Option 2 - Upgrades Over 10 Years

This option is the "pay as you go" option. Common Sense might suggest that this is the most financially responsible option but that ignores a number of factors. First of all, inflation in construction and energy are outpacing the bond interest. By locking in a low interest rate bond, the value of the construction is locked in for 20 years. Also, by putting off needed improvements the district is denied the benefits of lower energy bills and better teacher and student performance. The result is a much higher long-term cost.

Building Aid is assumed to not be available due to the projects being paid through the operating budget. If Building Aid is available it would be limited by rules setting maximum size and cost of projects. Emerson and Gilsum would only be allowed a small amount of state aid due to the fact that they have received large additions within the last 50 years that received Building Aid.

BUILDING PROJECT COST	=	**$0**
STATE BUILDING AID	=	**$??**
BOND AMOUNT	=	**$0**
LIFE -CYCLE, 10YR COSTS	=	**$40,974,573**

Option 3 – Additions/Renovations District Wide in One Year

This option performs all upgrades of Option 2 in one year by financing it through a bond. By combining all the district needs into one project there is an economy of scale. As mentioned in Option 2, the cost of the interest on the bond is lower than the cost of

inflation. Add to that the benefit of better facilities on maintenance and performance and the net cost of this option is much lower than doing the projects over time.

As in Option 1, State Building Aid would be limited in this scenario. Some facilities have received Building Aid in the last 50 years and those projects need to be deducted from the square foot of new construction financed by State Aid. The State also requires that renovations not exceed 60% of the value of the existing building. Renovations at Gilsum and Troy exceed 60% of their current value.

BUILDING PROJECT COST	=	**$21,9351,000**
STATE BUILDING AID	=	**$5,355,505**
BOND AMOUNT	=	**$16,579,496**
LIFE -CYCLE, 10YR COSTS	=	**$26,652,923**

Option 4 – New South Elementary, Additions/Renovations North Schools

Due to the demographics and the relatively small size of Emerson and Troy it makes sense to combine these schools into one. Both Emerson and Troy have numerous upgrades making a new school somewhat close in cost. If both buildings can be repurposed it is possible to see revenue from the property taxes. The efficiency of a new school adds to the savings. Most importantly this option meets many of the States criteria for Building Aid and is more likely to receive aid than the previous options.

This option does not address all the needs and most notably does not make any change to the site at Cutler.

BUILDING PROJECT COST	=	**$26,226,000**
STATE BUILDING AID	=	**$10,196,712**
BOND AMOUNT	=	**$16,029,288**
LIFE -CYCLE, 10YR COSTS	=	**$25,739,998**

Option 5 – New South Elementary, Additions/Renovations to Mt Caesar for North School for Swanzey, Additions/Renovations to Gilsum

Like Option 4, this consolidates Fitzwilliam and Troy into one new school but here Cutler is moved to the Mt Caesar site to create one school for Swanzey. This would be a relatively easy change for Swanzey since Cutler and Mt Caesar already share the same students split by grade. A single school for Swanzey would benefit the students since there would not be the transition to a new school at third grade.

BUILDING PROJECT COST	=	**$30,649,000**
STATE BUILDING AID	=	**$14,427,396**
BOND AMOUNT	=	**$16,221,604**
LIFE -CYCLE, 10YR COSTS	=	**$22,427,410**

Option 6 – New Single Consolidated Elementary School

A common sense approach might be to consolidate all the elementary school students into one central school building. This would simplify administration and maintenance. However, the experience for the students would probably not be as favorable. The school would need to hold over 1000 students which is very large for elementary ages. It would also be a very intense use for the site which would most likely be the Mt Caesar site.

The State caps Building Aid on the number of square feet per student minus any previous projects that already received Building Aid. This results in all-new construction receiving less Aid than projects that reuse buildings.

BUILDING PROJECT COST	=	**$34,332,000**
STATE BUILDING AID	=	**$6,237,792**
BOND AMOUNT	=	**$28,094,208**
LIFE -CYCLE, 10YR COSTS	=	**$29,634,149**

Option 7 – New South Elementary, Additions/Renovations to Mt Caesar for North School, Redistrict

This option consolidates five schools down to two by closing four schools and building one new on. A new South Elementary would be constructed somewhere central to Troy, Richmond and Fitzwilliam, and Mt Caesar would receive additions and renovations to make a North Elementary. These two schools would be equal in size making them efficient to staff and operate. This also provides the most equivalent experience for students throughout the district. It does require that students are distributed equally meaning that some students from Swanzey would likely attend the South School.

As in Option 6, State Building Aid is reduced due to previous projects having to be deducted from the amount of new construction allowed. Even still, the savings for the improved efficiency make this option only 10% higher over 10 years than the baseline "Do Nothing" option.

BUILDING PROJECT COST	=	**$28,338,000**
STATE BUILDING AID	=	**$8,142,984**
BOND AMOUNT	=	**$20,195,016**
LIFE -CYCLE, 10YR COSTS	=	**$20,986,650**

Option 8 – Additions/Renovations to Troy for South Elementary,
Additions/Renovations to Mt Caesar for North School, Redistrict

The final option is similar to the previous in that it consolidates the district into just two elementary schools, one North located at Mt Caesar and one South, now located at Troy. It preserves the Troy school which is a historic building. This option is as efficient as Option 7 for operations.

The existing Troy school can be challenging to work with, but it also gives some unique opportunities. The existing building is 3-stories which keeps the footprint of the building small. If a 3-story addition were constructed to replace the 1-story wing, it is possible to have a much larger facility that does not occupy more area than it currently does.

BUILDING PROJECT COST	=	**$24,519,000**
STATE BUILDING AID	=	**$11,000,260**
BOND AMOUNT	=	**$13,518,740**
LIFE -CYCLE, 10YR COSTS	=	**$18,649,929**

RECOMMENDATION

It is clear the cost of upgrading the Monadnock Regional School District facilities can be done cost effectively. The cost of doing nothing or trying to pay-as-you-go can be expensive and does not give the benefits of upgraded facilities right away. Which option is best can be a matter of opinion and subject to intangible influences.

In general, the concept of two schools, one North in the district and one South in the district meets the needs within a reasonable cost. This effectively reduces the options down to Option 5, Option 7 and Option 8.

Option 8 "Additions and Renovations to Mt Caesar and Troy to create a North and a South elementary schools" has many advantages over the other options. It has the lowest Bond cost and the lowest Life-Cycle cost. It addresses all the issues for building and educational needs. It probably has the best chance for receiving State Building Aid. It scores well on the states criteria. The fact that the district already owns both properties means that a construction proposal can be generated much more quickly which could be key in an application process that is competitive.

End Report

Monadnock Regional School District
Elementary School Improvements

Student Enrollment per Option

		Student Capacity						Total
		Cutler	Emerson	Gilsum	Mt Caesar	Troy	New	
Option #1	Do Nothing	275	200	100	275	200		1,050
Option #2	Additions / Renovations Over Ten Years.	275	200	100	275	200		1,050
Option #3	Additions / Renovations District Wide in One Year	275	200	100	275	200		1,050
Option #4	New South Elementary, Additions / Renovations to North Schools	275		100	275		400	1,050
Option #5	New South Elementary, Add/Reno to Mt Caesar for Swanzey, Add/Reno to Gilsum			100	550		400	1,050
Option #6	Consolidate all Elementary onto Mt Caesar Site				1,050			1,050
Option #7	New South Elementary and Mt Caesar North with Redistricting				525		525	1,050
Option #8	Troy South Elementary and Mt Caesar North with Redistricting				525	525		1,050

Monadnock Regional School District
Elementary School Improvements

Total Building Project Cost per Option

		Building Project Costs						Total
		Cutler	Emerson	Gilsum	Mt Caesar	Troy	New	
Option #1	Do Nothing							$ -
Option #2	Renovations and Additions Over Ten Years.							$ -
Option #3	Additions/Renovations District Wide in One Year	$ 4,124,000	$ 3,493,000	$ 4,644,000	$ 1,874,000	$ 7,800,000		$ 21,935,000
Option #4	New South Elementary, Additions/Renovations to North Schools	$ 4,124,000		$ 4,644,000	$ 1,874,000		$ 15,584,000	$ 26,226,000
Option #5	New South Elementary, Mt Caesar North Elementary, Add/Reno to Gilsum			$ 4,644,000	$ 10,421,000		$ 15,584,000	$ 30,649,000
Option #6	Consolidate all Elementary onto Mt Caesar Site						$ 34,332,000	$ 34,332,000
Option #7	New South Elementary and Mt Caesar North with Redistricting				$ 9,023,000		$ 19,315,000	$ 28,338,000
Option #8	Troy South Elementary and Mt Caesar North with Redistricting				$ 9,023,000	$ 15,496,000		$ 24,519,000

Monadnock Regional School District
Elementary School Improvements

Bond Cost per Option Comparison

		Bond Amount						Total
		Cutler	Emerson	Gilsum	Mt Caesar	Troy	New	
Option #1	Do Nothing							$ -
Option #2	Renovations and Additions Over Ten Years.							$ -
Option #3	Additions/Renovations District Wide in One Year	$ 3,739,304	$ 3,029,248	$ 4,259,304	$ 862,040	$ 4,689,600		$ 16,579,496
Option #4	New South Elementary, Additions/Renovations to North Schools	$ 3,739,304		$ 4,259,304	$ 862,040		$ 7,168,640	$ 16,029,288
Option #5	New South Elementary, Mt Caesar North Elementary, Add/Reno to Gilsum			$ 4,259,304	$ 4,793,660		$ 7,168,640	$ 16,221,604
Option #6	Consolidate all Elementary onto Mt Caesar Site						$ 28,094,208	$ 28,094,208
Option #7	New South Elementary and Mt Caesar North with Redistricting				$ 7,730,348		$ 12,464,668	$ 20,195,016
Option #8	Troy South Elementary and Mt Caesar North with Redistricting				$ 7,730,348	$ 9,148,392		$ 16,878,740

Monadnock Regional School District
Elementary School Improvements

Life-Cylcle Cost Comparisons

		Life-Cycle Costs (including 54% State Buidling Aid and Bond) over 10 years						Total
		Cutler	Emerson	Gilsum	Mt Caesar	Troy	New	
Option #1	Do Nothing	$ 4,640,795	$ 4,367,291	$ 2,461,464	$ 3,940,213	$ 3,627,157		$ 19,036,920
Option #2	Renovations and Additions Over Ten Years.	$ 8,435,204	$ 7,610,766	$ 7,355,973	$ 5,910,134	$ 11,662,496		$ 40,974,573
Option #3	Additions/Renovations District Wide in One Year	$ 6,023,520	$ 5,430,060	$ 4,711,942	$ 4,527,478	$ 5,959,923		$ 26,652,923
Option #4	New South Elementary, Additions/Renovations to North Schools	$ 6,023,520		$ 4,711,942	$ 4,527,478		$ 10,477,058	$ 25,739,998
Option #5	New South Elementary, Mt Caesar North Elementary, Add/Reno to Gilsum			$ 4,711,942	$ 7,238,410		$ 10,477,058	$ 22,427,410
Option #6	Consolidate all Elementary onto Mt Caesar Site						$ 29,634,149	$ 29,634,149
Option #7	New South Elementary and Mt Caesar North with Redistricting				$ 9,376,831		$ 11,609,819	$ 20,986,650
Option #8	Troy South Elementary and Mt Caesar North with Redistricting				$ 9,376,831	$ 9,273,098		$ 18,649,929