SECTION 2

SITE AND BUILDING CAPACITY DATA

SITE SIZE ANALYSIS

The Site is generally referred to the size of the land associated to an educational facility and the improvements made on that land which include buildings, parking lots, athletic fields, etc. The size of the total land often allows or limits the amount of improvements or amenities that can be offered to a specific student population. The information below analyzes the existing site area against the recommended site area for programs of that type.

The following school site information comes from the Council of Educational Facility Planners International (CEFPI) Planning Guide:

- *Elementary School* sites should be a minimum of 10 acres plus an additional acre for each 100 students.
- *Middle School* sites should be a minimum of 20 acres plus an additional acre for each 100 students.
- *High School* sites should be a minimum of 30 acres plus an additional acre for each 100 students.

There are other publications with slight variation on these general rules of thumb, but in our experience, these recommendations have provided a fairly reliable benchmark for assessing general site conditions. Of course specific conditions (e.g. need for stadium parking, on-site sewer) may require additional area, and in tight urban sites the benchmark numbers may be unattainable.

It should also be noted that the recommended site size assumes the entire property is buildable. If the site has easements, wetlands, open water, unsuitable soils, or drastic topography that would not lend to the construction of buildings, parking, drives, or play areas the site size would have to increase based on the size of the unbuildable area.

Lake Mills High School site is contiguous at 43 acres and includes some competition fields for athletics. The site is accessed primarily by two roads, Lake Park to the north and Main Street to the west. For a High School site, two major roads is the bare minimum. Some general observations regarding the sites are as follows:

- The site has some significant topography change and parts of the site are low. It isn't certain at the time of the study if the low areas are protected wetlands but the entire site would not be considered "buildable".
- Several athletic fields are located off the main campus site.
- Site circulation traffic for parents, visitors, buses, and students appears to be challenging but not significantly worse than other high schools of the similar size and site constraints. District staff noted that the site functions better now than before but some level of improvement should be considered as the district grows in enrollment.

Further analyses of the site and building size is contained in the following table:

BUILDING AND SITE ANALYSIS

School	Existing site size [a,b]	Enrollment for 2014-2015	Recommended site size based on current student population	Existing building size [c]
Lake Mills High School (9th – 12th Grades)	Portion of 43 acre campus	417	34	139,300 sq. ft.

a. Site areas are based on GIS mapping data and include building, parking and outdoor activity areas.
b. Building size information was based on floor plans provided by the Lake Mills School District.

ANALYSIS OF BUILDING CAPACITIES

There are several ways to evaluate a school's maximum capacity.

1. Functional Design Capacity: Determine the maximum population for instructional spaces based on Best Practice square feet per student.
2. Gross Building Square Footage: Take the existing building overall square footage and divide it by the recommended square footage per student based on Best Practice.
3. Follow Board of Education policy (if available).

As enrollment fluctuations affect school districts nationwide, the physical capability of each building will determine whether or not enrollment should increase beyond its present level, or if it will be necessary to move students to other buildings more capable of accommodating such enrollment shifts. This analysis should provide a guide to measure each building's capability to handle a student population and provide a measuring stick to keep up with the changing needs.

HISTORICAL PERSPECTIVE ON SCHOOL CAPACITY

It is worthwhile to briefly cover why buildings are not able to contain the same number of students as when they were originally constructed. America's public schools can be traced back to 1640 when founders assumed families bore the responsibility of raising a child. Gradually, programs were added by Federal and State mandates that have dramatically affected the educational environment. The trend of increasing responsibilities for public schools has accelerated ever since.

1900-1910
- Health Instruction added

1910-1930
- Physical Education
- Vocational Education (Home Economics & Agriculture)

1940's
- Business Education
- Art & Music
- Speech & Drama
- Half-Day Kindergarten
- Lunch provided

1950's
- Expanded Science & Math
- Expanded Art & Music
- Foreign Language

1960's
- Advanced Placement
- Head Start
- Title I (Reading)
- Consumer & Career Education

1970's
- Special Education
- Title IX (equality for girl's athletics)
- Behavior Adjustment
- Breakfast provided

1980's
- Computer Education
- English as a Second Language
- Early Childhood
- Full-Day Kindergarten
- At-Risk Programs
- After School Programs

1990's
- Expanded Computer / Internet
- Inclusion of Special Education Learners
- School-to-Work Programs

Early 2000's
- Standardized Testing

In many districts, spaces that were once used as standard classrooms have been transformed into multiple educational environments that have to act as offices, teaching space for 4-6 students, and reference libraries for several different areas associated with Special Education. One of the most dramatic program requirements of the past 30 years may become obsolete in the near future. Computers first made their presence in schools around 1983 when a single Apple II was assigned to one building in may national schools. Now, many elementary schools assign a single lab to each grade, and the future may reverse these spaces back into classrooms as laptops and hand-held tablets become the norm for student production and research. The bottom line is the demand on educational space is always changing, and it should be expected that buildings need to change along with those programs.

TYPES OF CAPACITY CALCULATIONS

1. FUNCTIONAL CAPACITY BY AREA

Historically, building capacity has been determined by counting the number of classrooms and multiplying by the average number of students. This method of capacity calculation is sometimes called the "Design Capacity."

A more accurate Design Capacity, however, can be derived from evaluating the best practice square footage allowances per student in each individual room. Based on the best data currently available, we recommend 50 SF (square feet) per student at the kindergarten level, 35 SF per student for grades 1-5, and 30 SF per student at the middle and high school levels. This allows a standard elementary classroom (1250 SF kindergarten, 900 SF grades 1-5) to support a class of 25 students. At the middle school and high school levels, a standard 900 SF classroom can support up to 30 students. To calculate the total capacity of a building, then:

Each academic space (core subjects) has a calculated square footage. This square footage is then divided by the recommended SF/student. Other academic spaces throughout the building have their own "Best Practice" square footage allowances per student. The total population is then calculated by adding the student population of each academic space.

At the elementary level, only standard classrooms are included in the capacity analysis because students remain in their assigned classroom most of the day. At the Middle and High School, all instructional spaces are used in the calculation because students are rarely in the same room for more than one period.

Several areas are not included in this calculation:

- Special Education rooms are not included because it is unlikely that other students would fill their classroom seats while they are getting additional instruction elsewhere in the building.

- Labs are also not factored into this calculation because the intent of these spaces is to serve as resource areas for classes that would otherwise be located somewhere else in the school. For example, a computer lab dedicated to an English Department is not included because the students are physically leaving one space to use the other as a resource.

However, the Design Capacity method alone becomes flawed because it is unlikely that every room will be used at 100% capacity all the time. At the middle and high school levels, the capacity calculation needs to account for teacher prep time, bell schedules, and tutoring which would drop the total utilization of any one space. Even at the elementary school level, because of fluctuations in student population, it is impractical to expect every classroom to be filled completely to design capacity in any given school year. Taking school schedules, programmatic issues, and fluctuations in student populations into consideration, the Design Capacity is modified to create the final "**Functional Design Capacity**."

It's important to note that as a rule:

90% utilization is considered to be the **Functional Design Capacity** targeted at the **elementary level**.
80% utilization is considered to be the **Functional Design Capacity** targeted at the **middle and high school levels.**

For example, the targeted utilization at a middle or high school level represents scheduled use of a core subject room 6 to 7 periods out of an 8 period day, or between 75% and 88% of the time available for use.

2. CAPACITY BASED ON GROSS BUILDING SQUARE FOOTAGE

Information for determining recommended school capacity based on gross area per student is typically used for initial analysis of building enrollment capacity. Building area standards are derived from historic data compilation, optimal planning models for space utilization, and are found through regional and national educational research and planning organizations. There is not a recognized national standard for use in such reviews, and available data most current and determined to be most relevant to the School District's locality is utilized. The following ranges shown in the standards consulted indicate regional and programmatic differences between the school districts reviewed. The lower end square foot per student numbers may indicate that few auxiliary type spaces are provided. The higher end square foot per student numbers may indicate that more auxiliary type spaces are provided, i.e. Auditorium, Field House, Natatorium, etc. For smaller schools, the numbers are typically much higher than for larger schools.

Gross square footage for school planning based on school building projects built in Wisconsin over the last 15 years.

- *Elem. School*: 125 – 140 sq.ft. per student (average of 133 sq.ft.)
- *Middle School*: 150 – 170 sq.ft. per student (average of 160 sq.ft.)
- *High School*: 200 – 220 sq.ft. per student (average of 210 sq.ft.)

Gross square footage for school planning recommended by the *Minnesota Department of Children, Families & Learning - Guide for Planning Construction Projects*. This is one of the few State sponsored publications that actually lists size recommendations for educational environments. These area ranges were established to plan for the space needs of technology and new forms of instruction (Published 2002).

- *Elem. School*: 125 – 155 sq. ft. per student (average of 140 sq. ft.)
- *Middle School*: 170 – 200 sq. ft. per student (average of 185 sq. ft.)
- *High School*: 200 – 320 sq. ft. per student (average of 260 sq. ft.)

In order to keep the evaluation current and account for the present and future space needs of technology and new forms of instruction, the Wisconsin data and Minnesota DCFL information has been approximately averaged to create the unit of measure:

- 135 sq. ft. per student for the Elementary Schools
- 170 sq. ft. per student for the Middle School
- 235 sq. ft. per student for the High School

LMHS would be considered on the small end of HS enrollment compared to other statewide and the inclusion of auxiliary type spaces like (2) gyms and an auditorium increases the average square foot per student baseline. It is based on our experience that a 400+/- student population High School is typically around **400** sq. ft. per student and that is the basis for the calculation.

The gross square foot per student recommendations should be considered as a **baseline guide** for planning and analysis, and remain flexible in order to reflect the immediate needs and long term goals of the School District.

The maximum capacity is based on the existing building SF divided by the average SF per student listed. The resulting data for can then be used as an indicator to how the schools compare with National and State recommendations.

SUMMARY OF CAPACITY ANALYSIS

The table below indicates the current enrollment and the various methods to determine maximum potential enrollments for the existing High School facility.

- The first column lists the school analyzed.
- The second column lists the current enrollment.
- The third column shows the Functional Design Capacity calculation. *Note, as some academic areas are larger than needed to support current class sizes, achieving functional capacity in a space may require additional staff.*
- The fourth column shows the capacity based on the gross square footage of the building.

The current enrollment number listed IS from the 2014-2015 school year.

School	Current Enrollment (2014-2015)	Functional Capacity by Area [a,b]	Functional Capacity by Scheduling Procedure	Capacity based on Building Area
Lake Mills High School	417	650	560	348

a. Based on 30 sq. ft. per student for general classrooms. Science Rooms, FACE Labs, and Art Rooms use 50 sq. ft. per student. Tech Ed and Ag Lab spaces use 100+ sq. ft. per student.
b. Functional Design Capacity is 80% of the maximum capacity in High Schools.

DETAIL – HIGH SCHOOL

Functional Capacity by Area
This calculation included all regular academic spaces including the gym as Physical Education. Spaces not included in this calculation include:

- technical education labs used as breakout space
- additional physical education spaces
- special education classrooms
- media center
- cafeteria
- locker rooms

This Maximum Design Capacity equates to 813 students if each space was occupied to capacity every minute of the day. As stated earlier in this document, the Functional Design Capacity is 80% of that value. This means that the Functional Design Capacity for the High School is **650 students**.

Functional Capacity by Scheduling Procedure
Based on scheduling procedure, the administration has assigned practical capacities for each educational space within the school. While these capacities are not strictly based on the area of each space, they are based on general knowledge of how many students a teacher can effectively manage within the area. Totaling the scheduling capacities of each space yields maximum capacity of 700 students. Assuming an optimum utilization rate of 80% this yields a practical Design Capacity based on Administrative Scheduling Procedures of **560 students**.

The smaller number indicates that some academic spaces may be larger than needed for typically scheduled classes. This may also reflect lower staffing levels than would be supported by the academic environment. The number is substantially larger than the current student enrollment, however, which confirms that there is room for additional students in specific classrooms.

Capacity Based on Building Area
When the total building square footage is divided by the recommended high school area per student, the capacity calculation yields a significantly smaller number: 139,300 sq. ft. divided by 400 sq. ft. per student, equates to only **348 students**. Generally speaking, when Capacity by Building Area is significantly smaller than Functional Design Capacity, it is an indication that non-academic spaces in the facility are disproportionately sized. The aggregate of corridors, common-space, performance, and athletic spaces may be undersized for the amount of academic spaces provided.

CONCLUSION

*The current enrollment for this building is 417 students. Functional Capacity by Area yields the largest capacity at 650 students, or room for an additional **233** students. Functional Capacity by Scheduling Procedure produces a somewhat smaller capacity of 560 students, or room for an additional **143** students. This smaller number likely indicates that some of the academic spaces are larger than needed for typically scheduled classes. Capacity based on building area yields the lowest capacity at 348 students, which shows the building over capacity by **69** students. The discrepancy between the numbers reflects disproportionate non-academic student support areas.*

(See Attached Spreadsheets)

Revised 5.8.15

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Lake Mills HS - Utilization Study (Day 1)

Room No.	Primary Use of Room (Subject)	S.F. Area	Based on Square Feet per Student of Room Size	Based on Administrative Guidelines	Based on Total Square Feet139300@ 400	Periods 1 7:55-9:24	2 Adv. 9:28-9:57	3 10:01-11:30	Lunch	4 12:00-1:29	5 1:33-3:02	Avrg Class Size	% of use	# periods used (5)
303	Ag	1700	34	25		19	18	18			18	18.3	80.0	4
104	Art	1596	32	25		17	20			17	19	18.3	80.0	4
Auditorium	Auditorium (choir/orchestra use)													
204	Band	2125	43	25		12		12		12	12	12.0	80.0	4
115	Business	833	28	25		7	19	16		25	27	18.8	100.0	5
116	Business Computer Lab	953	24	25		25				10	14	16.3	60.0	3
Commons	Cafeteria	3096												
220	English	754	25	25		28	17	27			19	22.8	80.0	4
221	English	754	25	25		24	16	25		6	30	20.2	100.0	5
222	English	755	25	25		23	18	26			18	21.3	80.0	4
117	FACE	1971	39	25								0.0	0.0	0
322	Learning Center (JEDI)	656	22	25		6		13		11	14	11.0	80.0	4
212	Library Media Center	3866												
107	Math	1003	33	25		25	17	20		18	16	19.2	100.0	5
112	Math	896	30	25		23	20	24		11		19.5	80.0	4
114	Math	958	32	25			17	30		28	22	24.3	80.0	4
205	Orchestra/Choir (old stage)	1500	30	25		37		15		17	6	18.8	80.0	4
100	Lower Gym / PE	7786	25	25						20		20.0	20.0	1
201	Upper GymPE	8099	25	25		27		23		31	26	26.8	80.0	4
108	Science	1453	29	25		26	17	29		22	25	23.8	100.0	5
111	Science	1432	29	25		25	22	12		25	25	21.8	100.0	5
113	Science Lab	1456	29	25		18	16	19		25	17	19.0	100.0	5
209	Social Studies	754	25	25			20	27		28	22	24.3	100.0	5
210	Social Studies	754	25	25		26	20			22	29	24.3	80.0	4
211	Social Studies	753	25	25			17	12		29	6	16.0	80.0	4
121	Special Ed	793	14	25		9	17	9		9	9			
103 B	Special Ed	542	10	25		3	6	7		3	3			
323 (2)	Special Ed	1520	28	25		10	36	14		15	16			
302	Power/Construction/Storage	4577	31	25								0.0	0.0	0
312	Tech Ed- Computer Lab	2331	31	25		21	16				25	20.7	60.0	3
314	Tech Ed- Woods and Metals	4970	33	25						7		7.0	20.0	1
109	World Language	1003	33	25		24	22	22		29		24.3	80.0	4
208	World Language	754	25	25		24	22			19	18	20.8	80.0	4
219	World Language	753	25	25		15	15	25		24		19.8	80.0	4
AVERAGE												**18.2**	**73.6**	**3.7**
	Max Capacity		813	**700**	**348**									
	Functional Capacity		**650**	**560**										
	2014-15 Enroll.	**417**												
						474	408	425		463	436			

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Lake Mills HS - Utilization Study (Day 2)

Room No.	Primary Use of Room (Subject)	S.F. Area	Based on Square Feet per Student of Room Size	Based on Administrative Guidelines	Based on Total Square Feet139300@ 400	1 7:55-9:24	2 Adv. 9:28-9:57	3 10:01-11:30	Lunch	4 12:00-1:29	5 1:33-3:02	Avrg Class Size	% of use	# periods used (5)
303	Ag	1700	34	25		25	18	21		7		17.8	80.0	4
104	Art	1596	32	25		28	20	20		14	29	22.2	100.0	5
Auditorium	Auditorium (choir/orchestra use)													
204	Band	2125	43	25		72		12				42.0	40.0	2
115	Business	833	28	25			19	11		17	21	17.0	80.0	4
116	Business Computer Lab	953	24	25								0.0	0.0	0
Commons	Cafeteria	3096												
220	English	754	25	25		24	17	19		19		19.8	80.0	4
221	English	754	25	25		20	16	29			19	21.0	80.0	4
222	English	755	25	25		28	18	30		28	25	25.8	100.0	5
117	FACE	1971	39	25		7		15				11.0	40.0	2
322	Learning Center (JEDI)	656	22	25		6		3		14	8	7.8	80.0	4
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107	Math	1003	33	25			17	15		27	16	18.8	80.0	4
112	Math	896	30	25		29	20	29		25	27	26.0	100.0	5
114	Math	958	32	25		29	17	19			15	20.0	80.0	4
205	Orchestra/Choir (old stage)	1500	30	25		36		15		50	6	26.8	80.0	4
100	Lower Gym / PE	7786	25	25						26		26.0	20.0	1
201	Upper GymPE	8099	25	25		25		24		29	29	26.8	80.0	4
108	Science	1453	29	25			17	8		6	30	15.3	80.0	4
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211	Social Studies	753	25	25		28	17	18		28	25	23.2	100.0	5
121	Special Ed	793	14	25		9	17	9		9	9			
103 B	Special Ed	542	10	25		4	6	6		5	5			
323 (2)	Special Ed	1520	28	25		5	36	19		9	8			
302	Power/Construction/Storage	4577	31	25							18	18.0	20.0	1
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208	World Language	754	25	25			22	17			12	17.0	60.0	3
219	World Language	753	25	25			15	17		24		18.7	60.0	3
AVERAGE												**20.5**	**68.6**	**3.4**
	Max Capacity		813	**700**	**348**									
	Functional Capacity		**650**	**560**										
	2014-15 Enroll.	**417**												
						439	408	462		462	406			