

BOB: Welcome. I'm Bob Gorrell, Executive Director of the Maryland Interagency Commission on School Construction. I will be joined in presenting this webinar by IAC staff members Alex Donahue and Cassandra Viscarra.

This webinar is the fourth of four and describes how the measures and calculations required to create a score of a facility's relative educational suitability can serve to provide both planning and maintenance management information essential for efficient facilities management. Thank you for participating in the sharing of this foundational information that we believe will strengthen the understanding of many concepts that will be discussed at length in the upcoming meetings of the Workgroup on the Assessment and Funding of K-12 School Facilities.

We encourage your questions and you may submit them throughout the presentation. You will see a white box to the right of your screen with Q&A at the top. Please enter your questions there and we will attempt to answer them with the presentation material, or we will answer them at the end of the presentation, and we will continue to take questions until we have addressed them all or up to 1:00 PM at which time we will hard stop.

School Facility's Purpose

To support teaching and learning.



BOB: The purpose of a school facility is to support the delivery of educational programs and services. In webinar #1, we discussed the importance of portfolio management and the scale advantages that can be captured, yet measures begin with each facility. By viewing individual facilities' relative facility conditions and deviation from educational sufficiency, along with cost of ownership, we obtain an opportunity to improve the portfolio over time on a school-by-school basis.

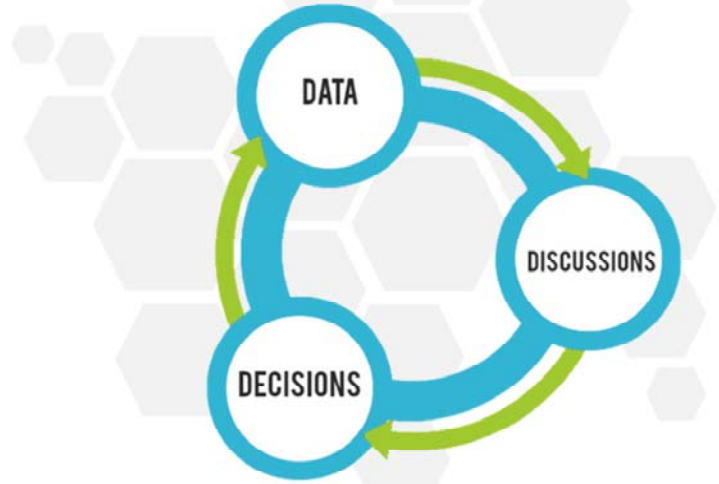
In webinar #2, we discussed total cost of ownership. Without viewing each facility AND the portfolio as a whole through the lens of fiscal sustainability, otherwise long term affordability may not be possible. Total cost of ownership is mostly dependent upon the size of the asset and the cost of maintenance and operations over its expected life. Good and comparable measures and data are required to make sound investment decisions for each school facility in the portfolio and especially when considering a new, replacement, or renewal facility decision.

In webinar #3, we discussed that the work of owning and operating a school facility is much more than just the routine work of paying the utility bills and tending the facility to keep it going by adjusting fan belts and keeping it clean. Good stewardship is also about knowing when to replace primary building systems and their components so that the total cost of ownership of each facility is minimized and avoid the trap of reactive maintenance.

In this fourth webinar, we will dive deeper into how the measuring tools for facility condition and educational sufficiency serve multiple facilities management purposes. For instance, we will discuss why a facility's aggregate facility condition index score, a measure of the overall physical deficiencies can provide a score important for strategic decisions of capital maintenance versus routine maintenance costs or the renewal or replacement of a facility. Good facilities measures allow us to make good investment choices that will provide the greatest gain for both educational sufficiency and facility-condition sustainability.

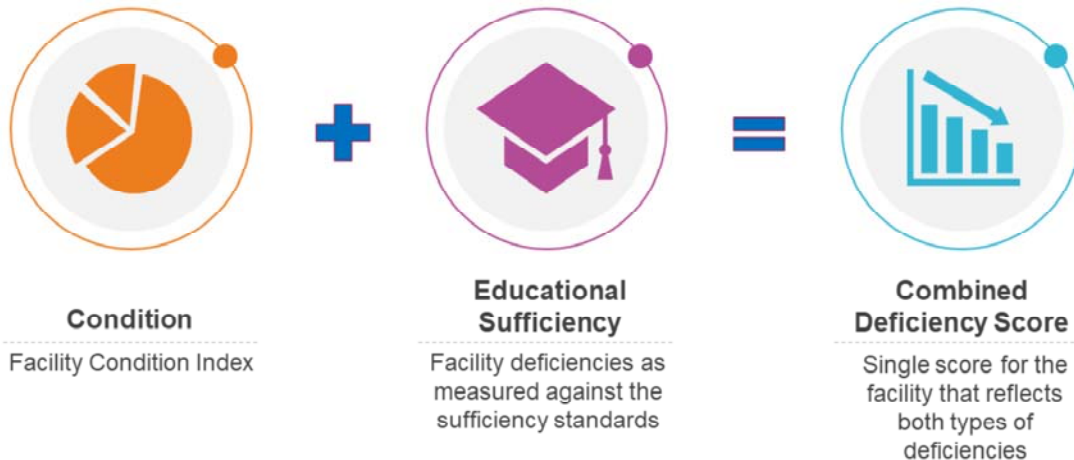
Efficient Management Requires Good Data

- Sustaining safety and functionality over time can be difficult.
- Good efficient management does not happen on its own. It requires people, a plan, resources, and expected outcomes that are measurable and comparable.
- Investment in facilities management is a decision that should be based on need and return-on-investment.



BOB: Newton's Law states that everything tends toward chaos or—otherwise said—everything decays, and this is certainly true of school facilities. A school facility is fully functional only on Day One and that is if it was designed and constructed perfectly and operates as expected. Facilities management is the business of maximizing facilities investments and must employ fiscally sustainable ownership practices that rely on good people and good data. Good data includes periodic assessments of each facility, although this data will only deliver value with skillful analysis and deliberate use of the information.

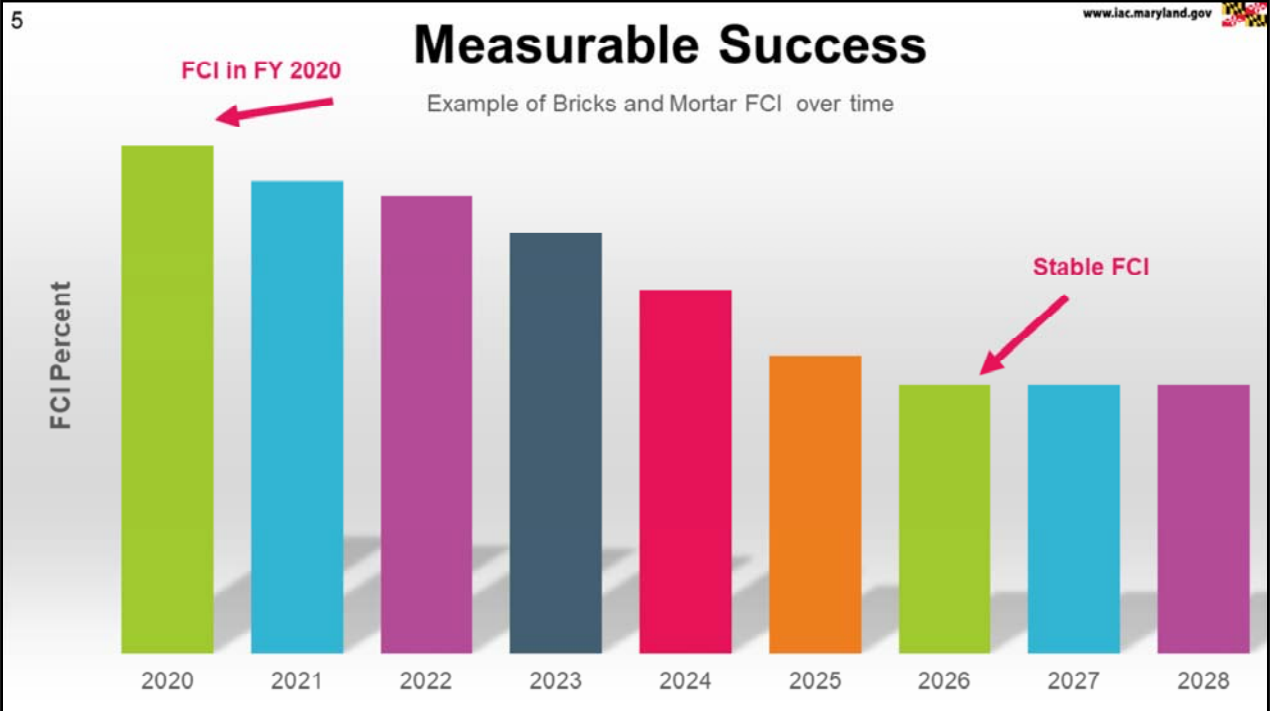
Defining Key Measurements



CASSANDRA: Buildings will not teach our children. Facilities only support teaching and learning, and can only do so effectively when they provide an environment that is safe, healthy, and supports the educational programs.

Each space in the facility must have basic minimum attributes, such as a reasonable amount of space and a useful configuration. Just as important, the facility must also be in a condition that facilitates rather than hinders teaching and learning. Because all facilities deteriorate over time, we periodically have to assess the facility for condition and educational sufficiency to identify emerging deficiencies to plan ahead. From the point of identifying an issue and moving forward on a repair, replacement, or a new school facility it takes about five years – and only if there is sufficient funding. The better the information and the higher the need, the more likely it is that a project is funded. By assessing facility condition and sufficiency, governmental decision makers and—even more importantly, the voters—can see and understand, and therefore support, the need for critical projects. To assess educational deficiencies of a facility, we separately assess two very different but equally critical components: physical conditions and educational sufficiency. Physical conditions are measured and result in a Facility Condition Index. This measure looks purely at the bricks and mortar elements of a facility. The second measure—educational sufficiency—looks at the usability of the space for supporting the delivery of education. Both elements must be considered in order to understand how well a facility functions for educating children. A brand new warehouse, for example, might get top marks for facility condition but probably wouldn't provide sufficient spaces to educate children.

When combined and weighted for relevancy, these factors result in a score that represents the deviation from sufficiency as a percentage, with 0% meaning the school facility is perfect. The deviation from sufficiency will be a combination of facility inadequacies (maybe a leaking roof), and educational inadequacies, which might be due to the absence of a specific and needed space or due to lack of space in general in high growth areas where students are unhoused and schools are overcrowded. For prioritization, this score can be used to compare one facility against others.



CASSANDRA: Maryland uses a homegrown measure of facility condition called the “Average Age of Square Footage” that was created before the common use of the Facilities Condition Index measure. This is a great example of Maryland’s innovative history. But it does not directly describe the condition of a facility because a facility’s condition does not always match its age. An old facility can be well maintained and working well as intended, and a relatively new facility can be quickly worn out to the point where it may not support its intended function. The “bricks and mortar” Facilities Condition Index, or FCI, is such a powerful measurement because it describes the condition, beginning with the facility’s major building systems and rolling up into the aggregate facility condition by quantifying the depleted percentage of lifespan. This is as close to an objective measure as we can get.

A facility’s physical condition as represented by the FCI is a key part of determining a school facility’s educational deficiency score. We can also use FCI to project the annual level of funding required to achieve or sustain a portfolio of facilities over time. For example, the slide above could be the results of a particular funding model that demonstrates a hypothetical projected average condition improvement of a school facilities portfolio over time, with certain levels of funding. The portfolio FCI score is a more accurate tool to gauge the average condition of our school facilities, and is very useful in achieving and maintaining certain results.

Using Life-span Depletion (%) to Quantify Physical Condition

Building-System Level



Facility Level

$$FCI \% = \frac{\text{Depleted Value}}{\text{Replacement Value}}$$

$$FCI \% = \frac{HVAC (FCI \%) + Roof (FCI \%) + Foundation (FCI \%) + etc.}{HVAC + Roof + Foundation + etc.}$$

CASSANDRA: A facility is made up of many components. The major components are building systems, which include the roof, windows, HVAC, foundation, electrical system, and so on. Each building system has an expected life and, as discussed in webinars #2 and #3, as a building system approaches its end-of-life, its reliability and intended function diminish up to the point of failure. The facility condition index, or FCI, at the building system level, is the percentage of depletion of the measured building systems. Knowing the FCI of each major building system is important for planning and practicing effective maintenance.

We determine a facility's FCI by aggregating the proportionate FCI of each of its building systems. It is important to know a facility's FCI to forecast its ability to perform its intended educational support function and to guide investment decisions such as when to repair or replace a facility. This is especially important in managing a portfolio as we generally have scarce resources, and knowing where we can get the biggest bang-for-the-buck is very important.

In this slide, the pie chart represents a typical building system such as a 20-year roof that has an estimated five years, or 25%, of its expected life span remaining. The FCI is 75% because the asset is three-quarters depleted. The higher the FCI, the worse the condition.

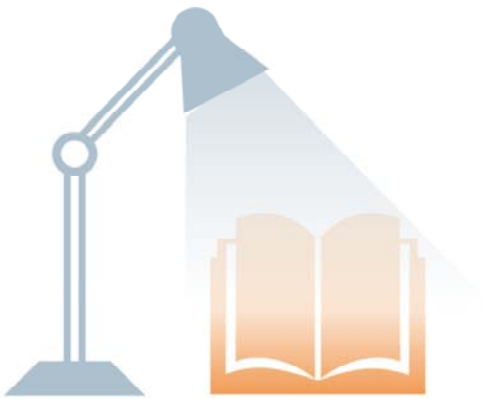
To calculate the FCI for a facility, we first determine the full replacement value of each of the major building systems, such as the foundation, exterior shell, roof, HVAC, plumbing system, electrical system, lighting, and so on. The denominator is the sum of these replacement values and the numerator is the sum of each building system's replacement value multiplied by its FCI percentage. If we want to know the FCI of our facilities portfolio, we similarly aggregate the proportionate FCI scores times the replacement value of each of its facilities.

EDUCATIONAL SUFFICIENCY

Maryland Educational Facilities Sufficiency Standards

Mandated by 2018's House Bill 1783 –
Md. Code Educ. Article § 5-310(c)

Adopted May 31, 2018



WHAT

Non-mandatory qualitative & quantitative standards describing the minimum facility attributes needed to deliver the educational programs and services required by the State

PURPOSE

Identify deficiencies in **existing** facilities that **substantially inhibit** the delivery of educational programs and services required by the State

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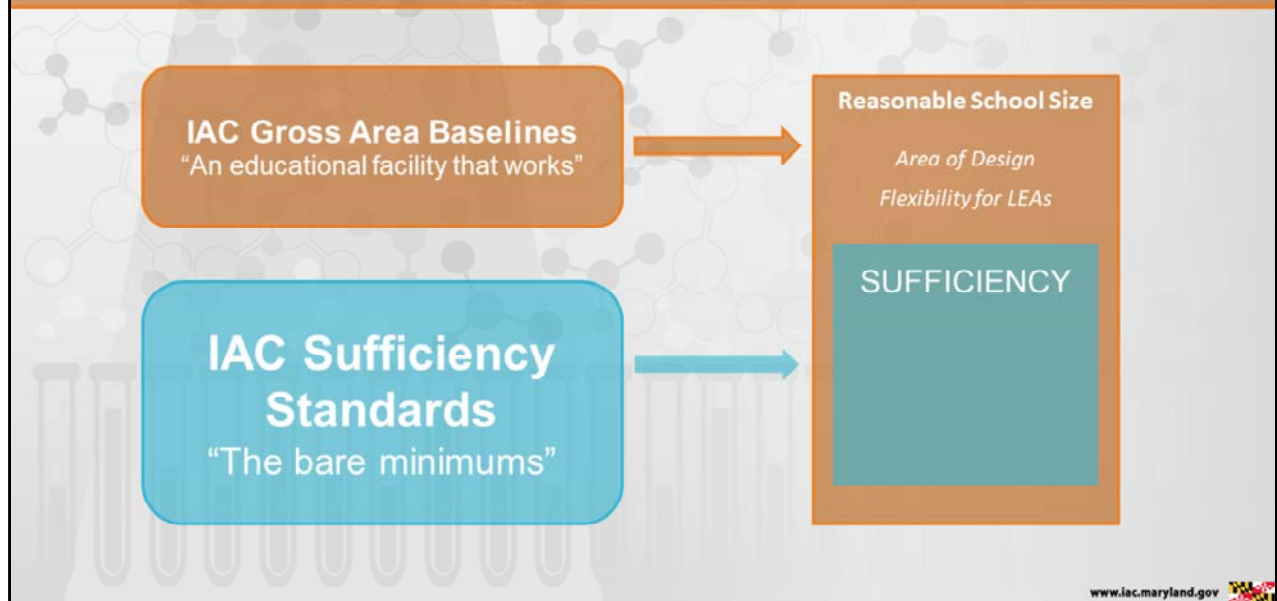
ALEX: The Sufficiency Standards are **not** what we would use to design a new school. They describe the minimum attributes needed to deliver the educational programs and services required by the State.

As we have said previously, to assess the educational deficiencies of a school facility, we separately assess two very different but equally critical components: physical conditions and educational sufficiency. We have already described how we measure the physical conditions. Now, we will discuss educational sufficiency.

To measure the educational sufficiency of a facility, we assess certain key attributes of the spaces within the facility against the Educational Facilities Sufficiency Standards (EFSS) that the IAC adopted in 2018.

These Standards were created by a thorough collaborative process over two years. They are non-mandatory qualitative & quantitative standards describing the minimum facility attributes needed to deliver the educational programs and services required by the State. These standards are based upon traditional practices of educational delivery. Their purpose is to identify deficiencies in existing facilities that substantially inhibit the delivery of educational programs and services. An example is the standard stating that the facility should be able to maintain classroom spaces at a temperature of 68 to 75 degrees Fahrenheit. When the temperature routinely remains outside this range in a given space, a deficiency is identified.

EDUCATIONAL FACILITIES SUFFICIENCY STANDARDS



ALEX: Using the Standards, we can establish a comparable measure of deviation from bare minimum educational sufficiency for an existing school facility at the point in time at which the measurement was made. We must periodically measure the educational sufficiency of each facility over the course of its service life in order to ensure that each school continues to support teaching and learning. A facility's score will be dynamic and will be adjusted by factors that change over time, such as enrollment and the natural depletion of building systems that directly affect education, such as temperature control and the building's shell, which keeps mother nature at bay. This information can be useful to LEAs for informing their public and governing bodies about relevant deficiencies that merit their consideration.

EDUCATIONAL FACILITIES SUFFICIENCY STANDARDS

A School Facility must be safe (COMAR 13A.01.04.03) and capable of being maintained.

Qualitative Example



An **exterior envelope** is safe and capable of being maintained if walls and roof are weather tight under normal conditions with routine upkeep.

ALEX: The Sufficiency Standards include both qualitative and quantitative standards. The qualitative standard for a roof is that it is weather tight under normal conditions with routine upkeep. If a roof is continually leaking over time despite attempts to stop the leaks, then the roof will qualify as a deficiency, regardless of whether it is only five years old out of an originally expected lifespan of 20 years.

As was presented in webinar #3 on maintenance, routine maintenance cannot prevent failure when a building system has exceeded its useful life and sometimes building systems of insufficient quality are built into a facility right from the start. Cheaper is not always better, and this type of issue is unfortunate but avoidable by careful planning through the lenses of total cost of ownership (webinar #2) and careful monitoring of the facility's construction.

Nevertheless, when a facility is not educationally sufficient, learning is impeded. Regular and impartial facility assessments of each school facility every 3-4 years, as provided through House Bill 1783, using the sufficiency standards will identify emerging problems and provide a educational sufficiency condition score for each school that is comparative to all other schools.

EDUCATIONAL FACILITIES SUFFICIENCY STANDARDS

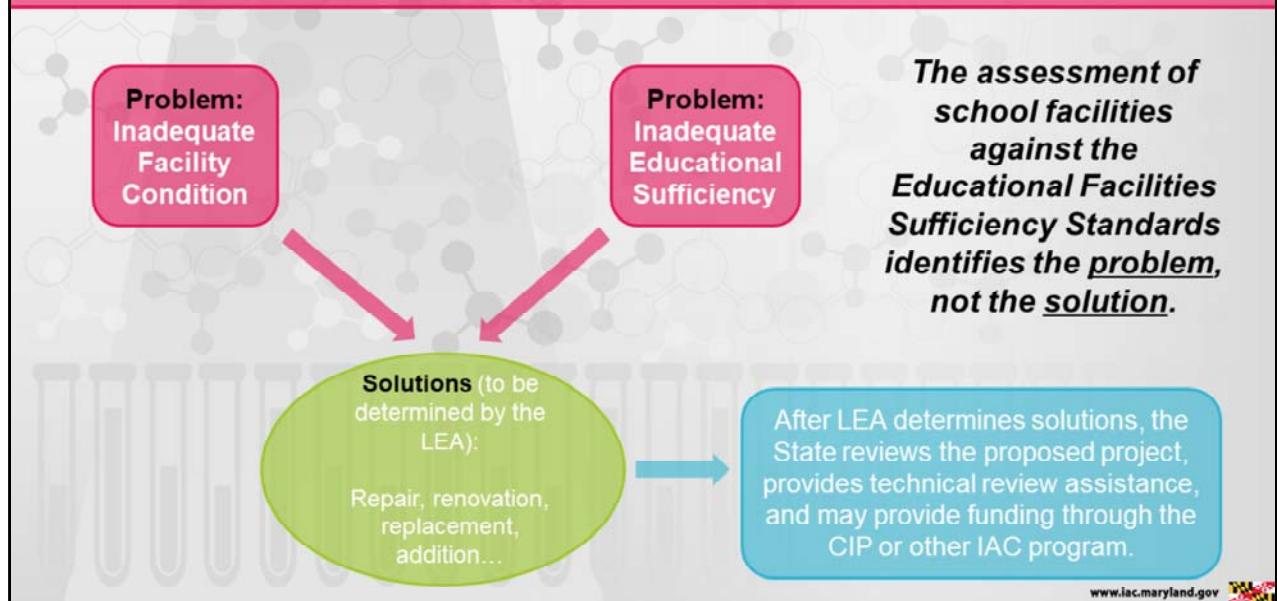
Quantitative Example

Cumulative classroom net square foot (sf) requirements, excluding in-classroom storage space and any in-classroom toilet rooms, shall be at least:

Prekindergarten	50 net sf/student
Kindergarten	50 net sf/student
Grades 1-8	32 net sf/student
Grades 9-12	25 net sf/student

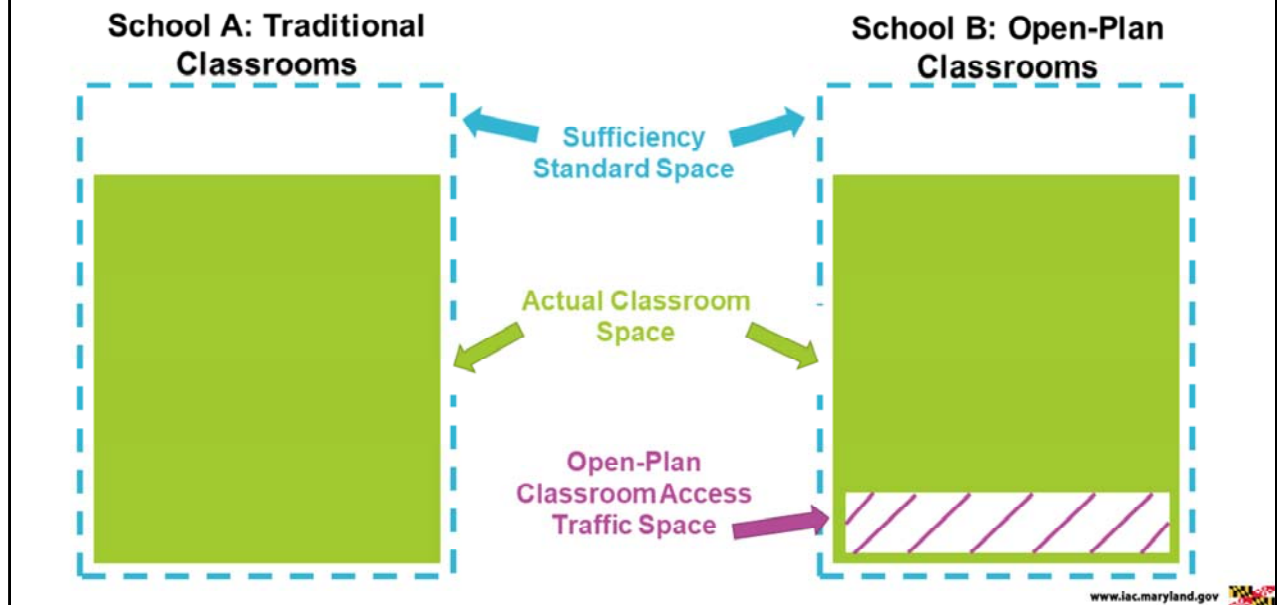
ALEX: The size of various spaces is one facility attribute in the standards that will be measured in each facility assessment. When it comes to an attribute like size, say, of regular classrooms, a quantitative standard is used in which a minimum net square footage per student is applied. Classrooms not meeting this standard are likely to present obstacles to teaching and learning because they will be too cramped, from the perspective of traditional classroom configuration and use. Of course, how cramped a classroom is depends upon how many students one is trying to serve in the space. The standards are based upon the State's standard expectations for class sizes. However, because these class sizes are not mandatory, LEAs may choose to operate smaller or larger classes as suits their needs and objectives. A final point to emphasize about the Sufficiency Standards is that they will evolve over time as state-required educational programs and services evolve. HB 1783 requires that the IAC periodically review and update the Sufficiency Standards.

EDUCATIONAL FACILITIES SUFFICIENCY STANDARDS



BOB: Assessing school facilities against the Sufficiency Standards only identifies problems that should be addressed because they are likely to reduce the ability of the facility to support its intended purpose – supporting the delivery of education. Assessing against standards does not infringe upon local control because the standards neither specify any particular solutions NOR mandate that the deficiencies necessarily be corrected. It may be that the deficiencies can be mitigated through administrative solutions until it makes sense for the facility to be completely renovated or replaced. In any case, the decision belongs to the facility owner – the LEA.

Measuring Deficiencies in Sufficiency






BOB: Here is a basic example of how we will assess general classrooms and create a deficiency value if there is a deficiency. The solid green area on the left side represents the existing general classrooms square footage for School A, which has traditional enclosed classrooms. On the right, we see the same total classroom area, but this facility was built as an open-plan school so 20% of the space has been subtracted to account for access traffic and other use inefficiencies.

Population growth in a community is often welcomed, but insufficient learning space will impede the delivery of education. The dotted blue lines represent the minimum sufficiency standards square footage for the school's enrollment that has been adjusted upward to represent the population five years forward. Any likely future growth must be factored into facilities planning. This is important because the delivery of building or administrative solutions, such as adding a new school or making a change to attendance zones, or both, can take five years from the point of problem recognition to the point of problem resolution.




The white area between the green and the dotted blue lines represents the missing classroom space. To estimate the cost to correct that deficiency, we take that square footage, adjusted to include any non-usable space such as the access traffic space, and multiply this by the cost per square foot to build that type of space.

Examples of Deficiencies in Sufficiency





Code Violation/Immediate Threat to Life, Safety or Health

-  Serious violations of fire, safety or building code
-  Lack of Air Conditioning
-  Asbestos in air

Space Related (insufficient for number of students)

-  Not enough general classroom space
-  Not enough specialty classroom space
-  Not enough cafeteria space

Facility Related

-  Heating/air equipment not maintainable
-  Not enough parking/driveways
-  Roof nearing end-of-life failure
-  Classroom lighting levels below standards



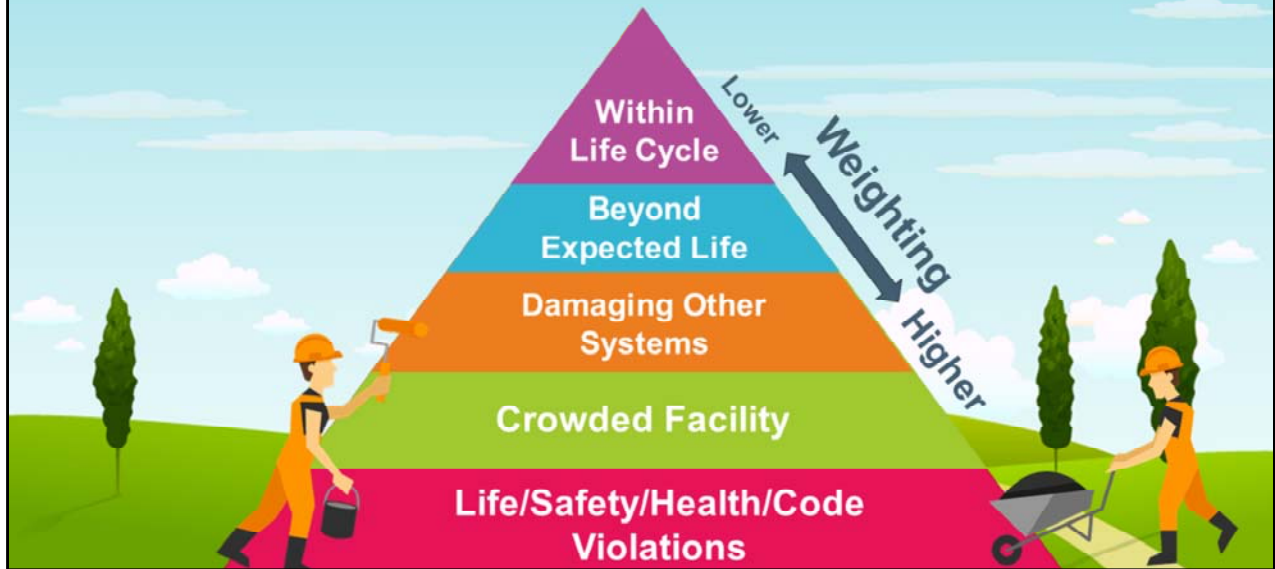
**Common Deficiencies that
Could Inhibit Teaching &
Learning**

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BOB: Here are a few examples of facility deficiencies that can directly affect teaching and learning. Of course, if a facility provides an unhealthy environment such as due to very high or very low indoor air temperatures, contaminants such as asbestos, or a leaking roof or windows that now are growing mold, then the facility cannot support education and it should not be occupied. In the previous slide, we demonstrated how we assess and create a value to correct a deficiency of general classroom space. Not having enough of other types of spaces can also impede learning. Learning can be impeded by many other sufficiency standard deficiencies such as poor acoustics, poor lighting, insufficient outlets to plug in needed equipment, insufficient internet access, unreliable temperature control, carbon dioxide levels that make us sleepy, and many more. We could continue for an hour describing conditions that are not conducive to the delivery of education.

This said, we also know that there is no perfect learning space and that teachers are amazingly resourceful as they overcome issues and obstacles to accomplish their work that other professions likely cannot even imagine. And this is a good thing. Yet, to keep every teacher and every student in every school in a decent environment means that we must know the worst deficiencies and endeavor to correct them. Therefore, it is important to weight each identified deficiency based upon its impact on teaching and learning.

Educational Facilities Deficiencies



CASSANDRA: Why should we weight deficiencies differently? Because not every deficiency has the same impact on teaching and learning. In order to apply our scarce resources to best effect, we must weight more heavily the deficiencies that are most detrimental to teaching and learning. Just like Maslow’s hierarchy of needs, there are some facility attributes that are basic or essential – and without them, teachers cannot teach and students cannot learn.

Weighting prioritizes the deficiencies at the bottom of the pyramid to ensure that students are in safe and healthy environments. A student in a facility without air conditioning or heating will be unable to learn when it is too hot or too cold, so this deficiency should be weighted heavily. A student in a crowded facility will also struggle to learn, so this might also be heavily weighted.

Other weighting categories might protect the facility asset. Deficiencies in a building system that cause damage to other building systems, for example, such as addressing a window that leaks, obviously aren’t as critical as making sure that a child is warm, safe, and dry, but are still important because the damage to other parts of the building can cost serious money to correct. These sorts of deficiencies might be weighted, but perhaps not as heavily as a health or safety issue.

Regular assessments are important, and weighting must match the issue. For instance, in the example of the leaking window, if the condition worsens because leaks causes dangerous mold, the weighting should be elevated to the code/life/safety/health level.

Creating a Deficiency Score



ALEX: To reflect the overall needs of a given school facility and to enable comparisons of one facility against another, we weight the condition deficiencies and the sufficiency deficiencies appropriately and then combine them to create a weighted Deficiency Score. Such a customized deficiency score in Maryland could be called the Maryland Condition Index.

Because facility conditions change over time, we must reassess each facility's condition and sufficiency at least every four years and mathematically adjust each facility's score annually to keep the score as representative as possible.

A Deficiency Score Reflects...



- No Air Conditioning
- Overcrowded
- Building Systems not maintainable



- Air Conditioned
- At Capacity
- Facility generally operates as needed



Cassandra: Every child in Maryland should have a seat in an educationally sufficient facility. Without a deficiency score for each facility in the state, we will not be able to objectively and comparably identify the greatest needs for corrective action in order to become educationally sufficient. Pursuant to authorization in 2018 by the General Assembly, the IAC is proceeding to conduct a statewide assessment of the condition and sufficiency of all public Pre-K-12 facilities in Maryland. Upon completion of the assessment, Maryland will have comparable facilities data that will allow the State to more accurately quantify the existing need and provide critical information to the LEAs for prioritizing their limited resources for the greatest return on investment.

Empowering LEAs

Facilities are a collaborative process...

- Community involvement to empower
- Design to function
- Measure to improve



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Bob: A Maryland Condition Index can be a primary measure of how we in Maryland are doing in our stewardship of our public school facilities and can help us identify what steps could or should be taken next. The best solution in a given case might be quite different from that in another case. For example, in an LEA with underutilized and problematic facilities in a given area, it might make more sense to build a single replacement facility to serve all the students in that area, which could yield a much lower total cost of ownership and better meet the educational needs for decades to come. In contrast, an LEA experiencing substantial enrollment growth across an area might need to retain and renovate or even expand a number of existing schools in order to meet the projected demand.

A weighted educational facility deficiency score is a powerful tool for individual school and portfolio planning and informed investment decision making.

A Facility Condition Index score, which is a subset of the educational facility deficiency score, is also extremely valuable because it gives a school district the ability to estimate and forecast the costs of maintaining conditions over time.

Regardless of the value of these informational tools, decisions on what is best for an LEA's investment must be made locally by the LEA and for the good of their entire portfolio, their community, and ultimately every child in every seat that they serve. With the tools provided through this assessment, decisions at the local level can be better informed and the public can trust that decision makers at all levels have meaningful measures of facilities condition.



... A healthy, safe, and educationally sufficient learning environment for every child in every seat in Maryland.



Questions?

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BOB: Ultimately, we all agree that we need a healthy, safe, and educationally sufficient learning environment for every child in every seat in Maryland. Keeping our facilities educationally sufficient requires that we maintain them, and by measuring our maintenance effectiveness is how we'll improve our level of success. Good measures will also help us estimate the resources needed to do the work properly, and how we can do it better. This is all part of getting to fiscal sustainability and educational sufficiency.

This is the last of the four webinars that preceding the Assessment and Funding Workgroup's meeting and we hope they have been informative. Thank you again for joining us today. The Workgroup meeting is scheduled for August 28, at 9AM, in the Senate Building. We hope that you can attend that meeting, and if not it will be broadcast and a recording will be available on our website.

Now, we will answer the unanswered questions received during the webinar and we will take any additional questions you may have.

We will keep the webinar open for 2-3 minutes after the last question received or up until 1PM when we are scheduled to end – whichever occurs first. If you have questions after we sign-off today, please send them to the address on the slide. If you have colleagues that were not able to attend today, please send them to our website where we will publish the recording of this webinar, all follow-up questions, and our the slide deck with our notes.



Up next...
**Workgroup on the Assessment and
Funding of School Facilities Meeting**



**In preparation for the
Workgroup on
Assessment & Funding
of School Facilities**

Workgroup Meeting
August 28th, 2019
9:00 – 1:00 PM

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