

Assessing the Condition of K-12 Public Schools

A Report to the
Washington State Legislature

December 2016



Energy Program

WASHINGTON STATE UNIVERSITY

Assessing the Condition of K-12 Public Schools

A key role of state government in the State of Washington is providing funding to support the construction and major upgrading of public schools. School construction funding is a shared responsibility, with local school districts and the state each providing a portion of the cost of building and renovating facilities.

It is important for the Washington State Legislature and the Office of the Superintendent of Public Instruction (OSPI) to have accurate, complete information about the condition of schools to inform the school funding process. Therefore, in 2015, the Legislature sought updated information about the condition of Washington's public school buildings. To get this information, the Legislature provided funds¹ to the Washington State University (WSU) Energy Program to perform a number of tasks focused on gathering and reviewing information about schools across the state. The Legislature also sought specific support from the WSU Energy Program for a new state program – the K-3 Class Size Reduction Grant Program.

This report provides information about the WSU Energy Program team's efforts during the first 16 months of this project. It includes summaries of progress on those activities, data from those efforts and some additional observations made by the field research teams of the WSU Energy Program.



¹ ESSB 6080 and 2EHB 1115.SL

WSU Energy Program Tasks:

- Verify count of necessary added classrooms conducted by districts applying for K-3 Class Size Reduction grants
- Conduct on-site data collection of sampling of school districts to calculate square footage of different space uses
- Conduct on-site visits to assess inventory and condition for school districts that have no current Study and Surveys on file
- Conduct on-site verification of data for school districts with Study and Surveys that will expire June 30, 2017
- Support completion of Chapter 1 of FY 2015-17 Study and Surveys

Provide K-3 Class Size Reduction Grant Support

The Class Size Reduction Grant program was initiated by the Legislature because it found that:

...some school districts may benefit from additional financial assistance to provide school facilities – beyond that which is provided through the school construction assistance grant program – for the purpose of constructing or acquiring additional classrooms to support state-funded all-day kindergarten and class size reduction in kindergarten through third grade. (ESSB 6080)

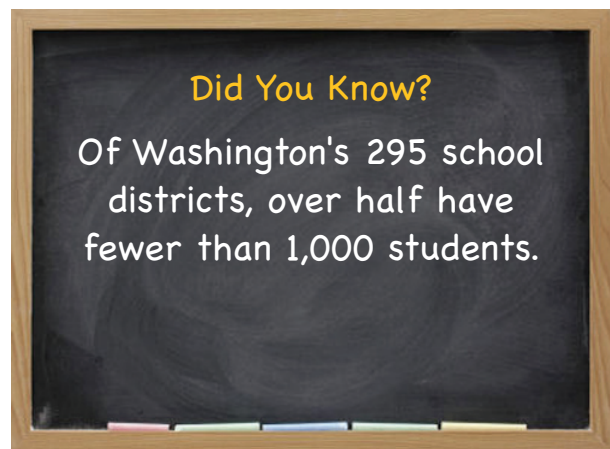
Each school district requesting classroom funding support under the program had to submit a count of its existing K-3 classrooms as part of documenting need. As noted above, the WSU Energy Program was tasked with verifying the classroom counts that determined eligibility for grant funding. In most cases, this involved going to the district requesting funds and verifying or modifying its count of existing classrooms.

The initial round of funding resulted in requests to OSPI for funding from 90 districts. The WSU Energy Program teams visited nearly 650 schools across those 90 districts to count and verify or modify the districts' classroom counts.

Overall, school districts did a good job of counting and reporting the number of true K-3 classrooms that they had. Most differences were a result of using "classrooms" for something else – such as teaching stations and special classes – rather than general K-3 education.

The WSU Energy Program classroom count verification teams added approximately three percent to the classroom count baselines provided by the districts in their initial grant applications. While this means that, overall, schools under-reported the number of classrooms that they had, there were districts that also over-reported the number of classrooms. The WSU Energy Program identified the following challenges during the onsite verification efforts:

- There was some uncertainty about what constituted a classroom, due to the absence at the beginning of the effort of a definition of what constitutes a classroom: minimum size, windows to exterior, etc.
- School districts reported spaces as classrooms that are used for instruction but could not be considered a traditional classroom, such as an area behind a stage or a computer area in a library.
- Some districts did not correctly handle "derelict" portables. In the class size reduction grant funding language, "derelict" is defined as needing more than \$50,000 in repairs. Some districts read this as \$50,000-worth of modernization is needed.



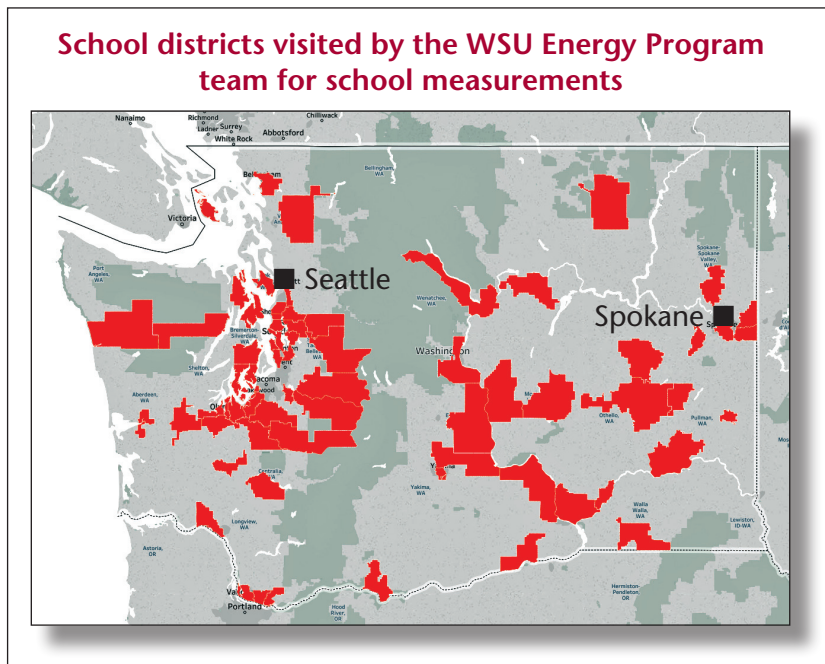
- Some school districts did not report classrooms that are currently being housed in portables or modular buildings.
- Districts sometimes removed from their count of classrooms available for general K-3 instruction any classrooms used for specialized instruction, such as English Language Learners or small group math/reading instruction. According to the counting procedures, however, these spaces were available to be returned to use as traditional classrooms. They were counted as available classrooms, irrespective of whether the result would be a lack of instructional space for these types of specialized instruction.

OSPI has initiated preparation for a new round of class size reduction grants. Working with the WSU Energy Program, it has clarified the counting and classification procedures for the effort to reduce the likelihood of count differences. The WSU Energy Program team is now performing a new round of verifications to support additional grant requests in anticipation of further funding in the next biennium, reviewing requests from 11 more school districts through December 2016.

Measure Interior Square Footage

One important element in understanding the use and configuration of public schools is knowing how much space is actually allocated to the different functions and uses. To provide insight on this question, the WSU Energy Program was tasked with classifying and measuring the interior square footage of spaces in a diverse set of schools.

The WSU Energy Program divided the 295 districts into categories to cover requirements of the legislation, which were to measure a representative sample across different school types (elementary, middle, and high schools, along with skill centers) and ages in districts of differing sizes, relative property values, and growth rates.



To perform this task, the WSU Energy Program developed a sample of just over 100 schools (approximately five percent of the total public schools in the state) distributed across the different categories.

By using the general categories associated with calculating a district's Funding Assistance Percentage (FAP)² – which relates to the local assessed land value per pupil compared to the state average and enrollment growth – the WSU Energy Program was able to sample school types of differing vintages across the spectrum of FAP available to the state's school districts. The FAP bins were defined as above average (within 0-50 percent), or below the state average with either growing or not-growing enrollments. By using a school's characteristics and assigning each facility to a tiered bin comprised of facility type, vintage, and FAP, the WSU Energy Program was able to sample schools proportional to their presence in the state's public school inventory.

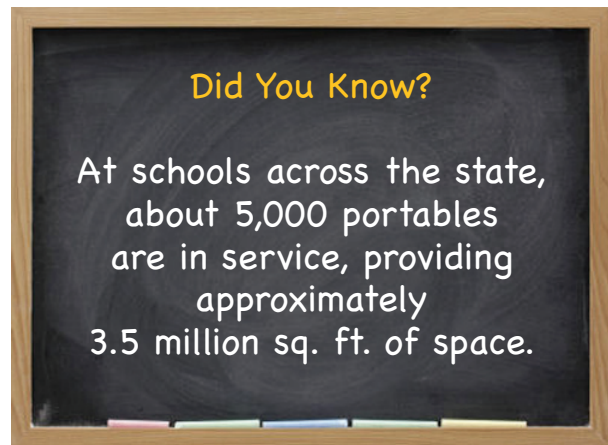


WSU Energy Program measuring teams have measured the total interior square footage of those buildings. Interior square footage measurements were taken in both permanent and portable structures to better understand how those spaces are used across the state. Portable structures are predominately used for instruction and storage, while permanent structures accommodate a wider diversity of functions – such as instruction, student services, food service, administrative, and building and custodial support.

Findings

In permanent structures, instructional spaces (including classroom/laboratory, physical education and library space) ranged on average from 61-65 percent of total school square footage. Instructional support, such as instructional storage or student services (health services, career centers, or club spaces, for example), added an additional 2-5 percent to this range. Beyond instruction, circulation space (such as hallways, bathrooms, and assembly spaces) made up the next largest percentage of space use, with values ranging from 18-24 percent of interior square footage from elementary to high school.

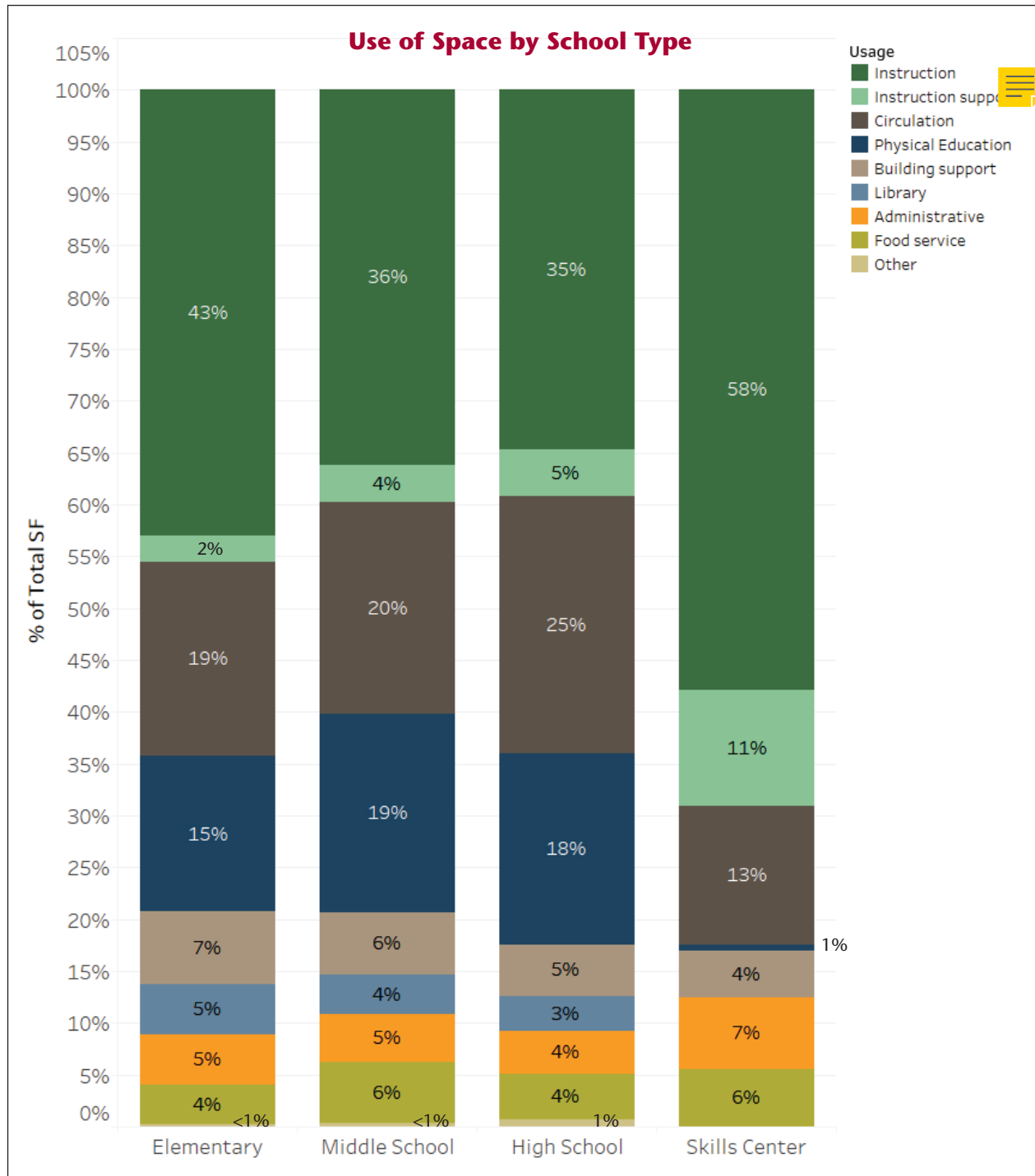
Particular categories of space allocation redistribute as schools serve older student populations. Within instructional usage, for example, classrooms make up a larger percentage of instructional spaces in elementary schools, while laboratory spaces increase as students enter middle school and beyond. Similarly, the overall percentage of classroom/laboratory total square footage reduces and the percentage of physical education space increases as students move from elementary to high school. Skill centers have a unique space allocation profile with much more classroom or laboratory space than their high school counterparts. However, they frequently lack physical education and library space, as those resources are available at the students' home facilities. Only in skill centers was more than half of the space dedicated directly to classrooms and laboratories. See the chart on page 6 for a breakdown by school type.



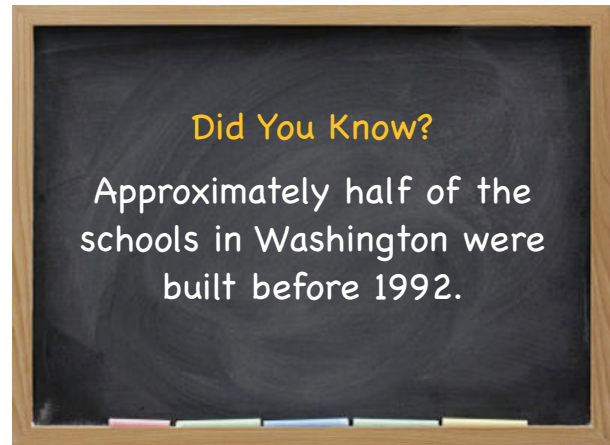
² Funding Assistance Percentage, as defined in RCW 28A.525.166.

Overall, school sizes varied substantially over school type, construction vintage, and district characteristics. The variability in school size by type may result from factors such as construction vintage or district characteristics, though no clear pattern among those variables was observed.

To standardize across schools of different enrollment sizes, the WSU Energy Program also examined a square feet per student metric. The median square footages calculated per student



were 123 for elementary students, 141 for middle schools and 157 for high school students. Medians were used because a few schools – typically from older vintages and remote rural areas – showed noticeably higher square footage per student values, artificially raising the average. In general, these are older schools, constructed before 1992, and the recent student population appears to be significantly reduced from what it may have been historically (and therefore what the school was designed to support), inflating the square footage per student for those schools.



The sample of schools is too small to provide reliable insights into some of the sub-categories identified in the Legislative direction.

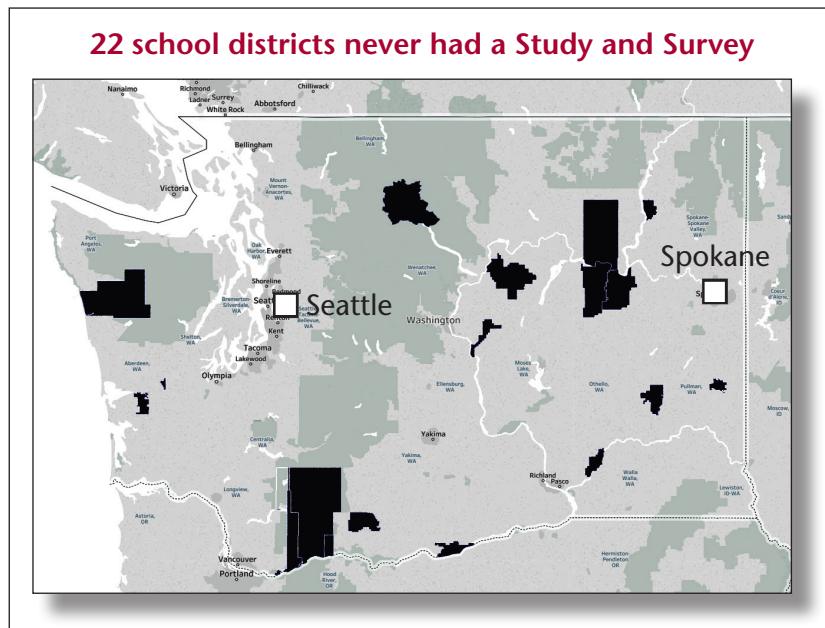
Continuing the data collection effort and expanding the number of schools assessed would provide the data necessary to allow deeper insights and address specific questions that are of interest to the Legislature or OSPI.

Assessing the Condition of Schools

The Legislature asked the WSU Energy Program to perform several tasks related to assessing the condition of individual schools. These are described below.

Support Study and Survey Process

The Study and Survey process is the entry point for districts seeking to qualify for funding through the School Construction Assistance Program (SCAP). Chapter 1 of the Study and Survey document is the inventory and area analysis of all existing facilities in a school district.³ Performing the work required to complete Chapter 1 involves several elements, the primary of which are gathering square footage information and performing Building Condition Assessments (BCA) on all of the district’s permanent, recognized facilities. The WSU Energy



³ As defined in the *School Facilities Manual*, School Construction Assistance Program (revised April 2011), Table 3.1 Study and Survey Report.

Program team is supporting the Study and Survey process in several ways:

- Conducting Chapter 1 assessments for districts that have never before had them.
- Reviewing and verifying a sample of recent Study and Survey Chapter 1 data provided for state construction or renovation funding requests.
- Supporting completion of Chapter 1 for new FY 2015-17 Study and Survey grants. Currently, 32 districts are eligible. The WSU Energy Program team has completed site visits and field data collection for over half of these.

Status

The 22 districts that have never performed a Study and Survey assessment of their facilities are smaller districts located mainly in eastern Washington in tax revenue limited areas of the state. The WSU Energy Program has started work on the assessment in 16 of those districts. The rest will be completed prior to the end of the biennium.

On the whole, these districts have older schools with older building systems and school designs



that are not optimized for current approaches to education. For many, their capital funding capacity is limited, which creates significant challenges in making simple building updates, and is even more challenging when major modernization is needed.

Three of the 22 districts have applied for and received Study and Survey grants from OSPI in FY 2015-17, indicating that they may be ready for funding of either a major upgrade or a new school.

The data collected from these school districts is entered into the Information and Condition of Schools (ICOS) software program, developed by OSPI. This database is used by OSPI to collect data from the Chapter 1 element of the Study and Survey process. It is then used in the allocation of funding for school construction and remodeling, and it provides a solid foundation that state leaders can rely on to build long-term funding solutions for Washington's schools.

The ICOS system was implemented in 2012, and holds building condition data from districts that have sought SCAP funding since that time. The WSU Energy Program has found that the ICOS system contains a large amount of valuable data, which field teams were able to validate and add to during the course of this project.

As noted above, one of the tasks assigned to the WSU Energy Program is validating data that is already in the system for accuracy. The data on the condition of schools that the system contains was provided by the school districts themselves, either collected and entered by district staff or by consultants (often architects) hired by the districts. Because of the relative newness of the system and the processes that support it, a review of this type was timely.

Initially, the WSU Energy Program identified 51 districts that had entered data into the ICOS system since May 2012 (when OPSI started to require Chapter 1 data to be collected and entered into the ICOS system), which includes approximately 600 facilities and 1,300 recognized buildings. Because some of the information submitted in 2012 could now be out of date, a



subset of districts with grants from FY 2013-15 was considered for the task of verifying the accuracy of ICOS entries. As an initial sample set, the WSU Energy Program identified eight school districts to verify the information that had been collected and added in FY 2013-15. All of these school district visits – complete with detailed data collection – have been completed.

The BCA component of the Study and Survey process is a highly subjective and individualized process, and ratings may differ depending on the rater’s experience level in the construction industry and the information obtained from the school district through onsite visits and additional conversations. OSPI provides training to standardize this process and encourage objective ratings.

On the whole, the consulting community is providing the school districts with accurate information in the Study and Survey process. However, the consistency of that information may vary depending on the level of understanding of OSPI’s expectations. As a result, the WSU Energy Program found some variation in the condition assessments that have been performed. In addition, it has found significant inconsistencies in how area analysis information was presented in the ICOS system and through uploaded files. OSPI specifies that data collected during the area analysis phase of the Study and Survey process should be easily consumed both in written form and in the ICOS user interface. Typically this information was found in multiple locations and was often difficult to tie back to the ICOS system. Although this information was presented poorly, the square footage calculations appeared to be accurate and presented in the ICOS system correctly.



Due to inconsistency in the presentation of Study and Survey data, the WSU Energy Program has recommended that OSPI continue to re-educate the qualified consultants that perform these activities for the districts. This would reduce the time required for OSPI to review this information and support a better data curation practice during the SCAP process.

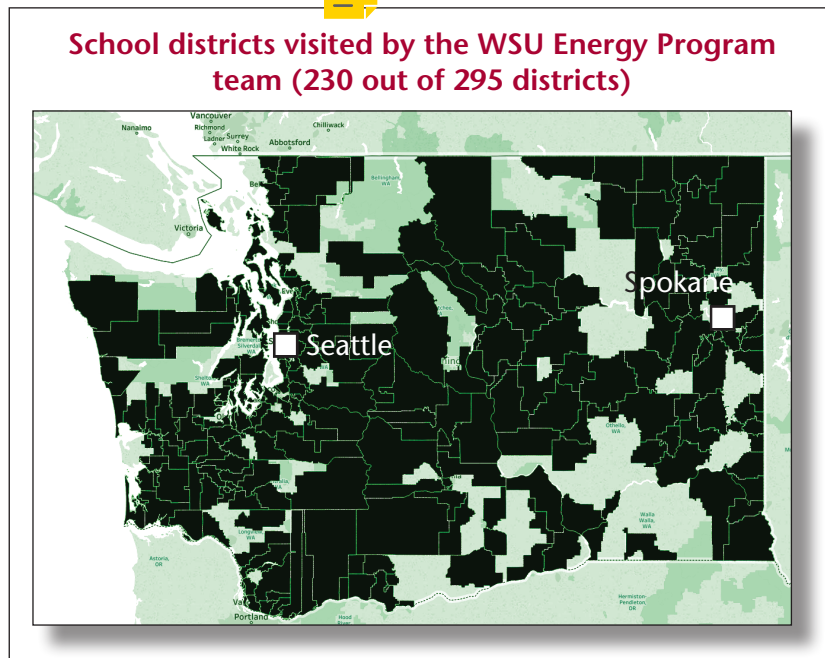
Finally, the WSU Energy Program is on track to complete the task of supporting the Chapter 1 portion of the new Study and Survey grant applicants. Its role can be either to actually perform the Chapter 1 data collection activities for the districts requesting funding or to review and

validate data collected on the district's behalf. Four districts asked the WSU Energy Program to validate data collected by a third-party consultant for Chapter 1 of their Study and Survey. The WSU Energy Program confirmed that the primary information used in the SCAP program is being collected correctly. Twelve districts requested that the WSU Energy Program collect data for Chapter 1 of their Study and Survey. The WSU Energy Program has initiated field data collection with each of these districts. The other 16 districts that have applied for Study and Survey funding support have not yet indicated the approach they prefer, and therefore the WSU Energy Program has not initiated data collection or review. Altogether, this effort will involve data collection or review of 245 facilities and over 750 buildings.

Conduct Additional Building Condition Assessments

Another task assigned to the WSU Energy Program was Conducting BCAs on facilities that had

no BCA information entered into the ICOS system. Over 1,200 permanent inventory buildings that did not have BCA information in the ICOS system were identified. To date, the WSU Energy Program team has visited 137 districts to collect BCA information on over 750 buildings. As a result of conversations with school district staff, almost 300 buildings were removed from the target list because either the district staff preferred to complete their own assessments, or the building status was updated (e.g., the building underwent a major renovation or was demolished). This task is approximately 90 percent complete.




Small reading group in a designated breakout space.
(Photo source: *The Olympian*, October 15, 2015.)

The result of a BCA is a facility score. A BCA rating of 52 indicates significant system failures, and these buildings will need to be substantially renovated or replaced in order to meet current safety codes. In buildings that were built or remodeled between 1902 and 1963, the WSU Energy Program team observed condition ratings that varied from 49 to 90. The average condition rating score for the buildings that the WSU Energy Program team evaluated when completing a BCA was 82. This indicates

that school district maintenance staffs are working effectively to ensure that their buildings remain at an acceptable level of service to deliver education with limited resources.

Observations

These field-intensive efforts involved collecting data in a wide range of school facilities across the state, which has included visits to over 1,000 schools in 230 of the state's 295 school districts. In addition, the WSU Energy Program has reviewed data previously provided to OSPI for accuracy and entry into the ICOS database.



After spending much of 2016 in school districts across the state, the WSU Energy Program field data collection teams have developed some observations about the schools and districts that they have visited, as well as the processes  which have been supported through this effort.

Designing and Adapting School Spaces for Flexibility

Overall, Washington has many schools that are well designed and well maintained, particularly in districts that have large tax bases and growing populations. These schools provide excellent learning environments. However, some small, rural districts continue to use school facilities that are outdated and are challenged to accommodate modern educational tools and approaches. Some of these have major systems, such as heating/ventilation and electrical systems, that have become difficult and expensive to maintain and support.

Further, new schools are designed to support current approaches to education, with breakout spaces allotted for small group instruction, student collaboration, and other special purposes. Many older schools were not designed with the current educational approaches in mind (such as small group instruction and collaboration). These schools are being adapted to accommodate new learning tools and approaches by using hallways and private offices as collaboration spaces and traditional classrooms for special purpose instruction. It is not uncommon to see chairs, desks and tables set up in the hallway outside of classrooms to provide small group instruction and collaboration spaces. School personnel are finding ways to use the facilities they have to support their education goals and methods.

The Study and Survey Process

As noted above, when a district decides to seek state funding support for a new school, the first step in the process is to perform a Study and Survey of the district's facilities. OSPI supports local decision making about school construction or renovation by facilitating access to funding for the Study and Survey process. This funding does not cover the full cost of the Study and Survey process as it is currently defined. Through conversations with school districts and the consulting community, the WSU Energy Program has learned that funding that has historically been provided to school districts may cover only the cost for Chapter 1 of the Study and Survey, depending on the scope of work that the school district defines.  Because the Study and Survey finished document has 10 other chapters, this leaves the other ac  to local funding.

Districts use the Study and Survey process differently, depending on specific needs. Some district staff have indicated that the Study and Survey process is only used as a "checking

the box” exercise required to receive SCAP funding. Other districts use the Study and Survey process as an opportunity to gain a comprehensive perspective on their buildings, understand their deficiencies, and help guide their long-term facility planning.

The use of the ICOS system to collect the information curated during the Study and Survey process is creating a more consistent and complete database for OSPI to report information back to the school districts and the Legislature. It is clear that OSPI’s investment in the system and its work to standardize the information that is entered into the system is paying dividends.

An enhancement in the practices and procedures related to the Study and Survey process and the use of the ICOS system would make it even more useful as a decision support system. Currently, only recognized buildings containing instructional spaces are required to be in the ICOS system. Some districts enter other types of buildings – such as portable buildings, administration space, and maintenance space. If this became a standard practice, the ICOS system would be able to provide a more comprehensive look at the facilities that support K-12 education in the state.

Best Practices in School Construction Management

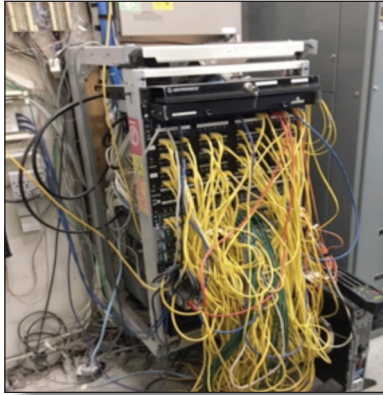
Many districts have experience with building and renovating schools and have developed systems to ensure that the schools are well built and that the district is set up for successful management of the schools. They have established practices that include:

- Obtaining electronic versions of school construction drawings. This ensures that they are able to easily plan for future improvements without having to redraw or purchase their own plans from the designer.
- Ensuring that the buildings are energy efficient. School buildings stay in service for decades – operating costs should be a consideration, even when it requires the design team to examine and incorporate innovative design elements or equipment with which they have limited experience.
- Ensuring that the buildings are easy to clean and maintain. Some finishes are more durable and easier to clean than others, and using them helps control costs as the buildings are used.
- Commissioning the new school’s major systems to ensure that they are working as designed.



Old boiler used to heat a school.

Many less experienced districts embarking on new construction or renovations could benefit from adopting these and other best practices from leading districts.



High-maintenance computer networking system.

Small District Operational Challenges

School district facilities staff are sometimes not fully trained on the equipment that they support and the methods and cleaning materials that would result in cleaner and safer learning environments. This can be particularly challenging in smaller, more rural districts where local training is not available to build their skills and knowledge. In many of these districts, facilities staff leverage people in their community to provide resources and technical expertise to stretch school district resources, but this may still not be sufficient for optimized operations. These challenges can be exacerbated by extra charges from specialty contractors to cover the longer travel times to provide service to them. For example, a school may need third party help servicing a fire suppression system,

but incur extra charges by the contractor to provide that service because it must travel farther to get there.

Further, many smaller district facilities personnel are stretched thin, and do not have the time to develop and manage minor repair or upgrade projects, or to run a contractor selection process for improvements. In this way, the staffing limits become limits on facility improvements, as well. These districts would likely benefit from additional support with upgrade and repair project development and implementation.

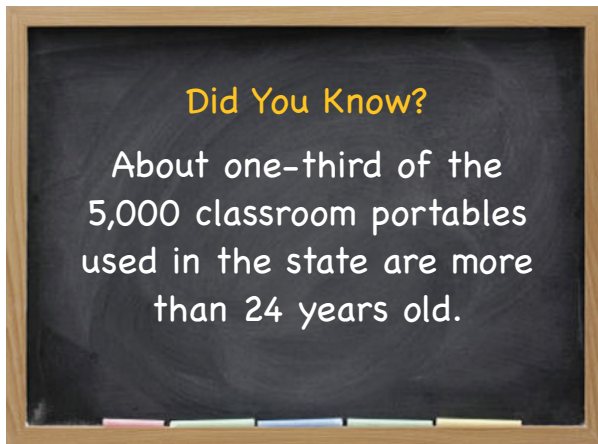


Portables are in use across the state, like this Army surplus unit.

Portable Classrooms

Approximately 5,000 portable classrooms are in service across the state, comprising about 3.5 million square feet. Portables are not considered to be recognized buildings by OSPI, so they are not tracked systematically through the ICOS system or any other method.

While many newer portables provide quality educational space, some older portables are substandard. In certain settings, school district personnel feel that portables make it more difficult to provide campus-wide security, as it is more challenging to control access to portables because they are not part of the main school buildings.



It is clear that portable classrooms will continue to be a part of the facility framework for the state's school systems for the foreseeable future. It is important, therefore, to ensure that these are providing quality learning environments.

Design and retrofit standards that include windows, energy efficiency and ventilation upgrades, and restrooms (where appropriate) can help ensure that these facilities are providing the highest quality learning environments possible.

Portable classrooms sometimes reach the end of their service while still being in relatively good shape, either because of new school construction that makes them unnecessary or because the school demographics change. The WSU Energy Program team has heard of units being sent to the landfill rather than relocated to another district that could make use of them. An organized statewide re-use program could help ensure that portables that are retired from schools before reaching the end of their useful life can be used at schools where they are needed.

Next Steps

The WSU Energy Program will continue its efforts through the rest of the biennium – supporting the OSPI administered K-3 Class Size Reduction Grant Program, completing BCAs for facilities that are not in the ICOS system and making sure that they are entered, and performing Study and Survey support for districts embarking on the process of developing or renovating schools. Each of these activities will be conducted in collaboration with OSPI, using the collaborative approach developed early in these efforts.

The data and information gathered in the continuing effort will be incorporated with the information already entered into the ICOS system – or the parallel tracking tools developed by the WSU Energy Program – to capture information that is not stored in ICOS.

The WSU Energy Program’s continuing goal is to provide OSPI and the Legislature with information that they can use to make better informed decisions about school facilities funding levels, and the programs, processes and procedures that can support the decision-makers, OSPI and the districts themselves.

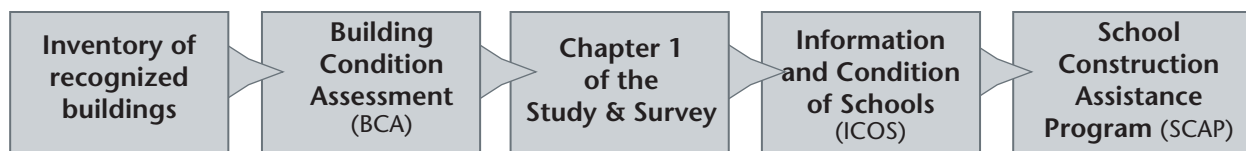
Of course, the need for some of these activities does not end with the close of the biennium. The WSU Energy Program has enhanced its expertise in facilities assessment and support through the work that it has done with OSPI. And, this expertise can be leveraged for additional support to the K-12 community in the coming years.



Appendix

Tools Used to Determine Eligibility for School Construction Funding Support

Information gathered with each tool feeds into the next tool and is ultimately evaluated in the SCAP process.



Tool Purpose – Summary				
Used by OSPI to identify buildings that require a BCA	Used to ensure that facilities in different school districts are evaluated in a standardized way	Completed by school districts that are applying for state construction or renovation funding	All data that is gathered with the tools listed at left is recorded in the ICOS database	Information in ICOS is evaluated to determine school districts' eligibility for funding assistance
Tool Purpose – Detail				
<p>This inventory includes all buildings in a school district that are on a permanent foundation and contain instructional spaces; it does not include portables, which comprise over 3.5 million square feet of the recognized K-12 educational space in Washington.</p> <p>This inventory is used by OSPI to identify buildings that require a BCA.</p>	<p>The BCA – a component of the Study & Survey – is a systematic rating of common building components, such as the building's foundation, envelope, and interior conditions.</p> <p>BCAs are important to ensure that facilities in different school districts are evaluated in a standardized way.</p>	<p>School districts provide information about their educational facilities in Chapter 1 of the Study & Survey when they want to apply for state construction or renovation funding.</p>	<p>The ICOS database is where school districts or their contractors record information about their school facilities (size, age of construction, usage, and condition).</p> <p>The WSU team is helping school districts enter new information into ICOS, and is verifying the accuracy of information that other school districts have already entered into ICOS.</p>	<p>SCAP provides funding assistance to school districts that are undertaking a major new construction or modernization project. Projects must meet eligibility requirements based on age and condition for modernization projects, or demonstrated need for more space for new construction projects.</p> <p>The state provides partial funding for eligible projects; school districts are responsible for securing local matching funds.</p>



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To advance environmental and economic well-being by providing unmatched energy services, products, education and information based on world-class research.

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