REPORT TO THE LEGISLATURE

STEM Pilot Project Grant Program

December 2016

Authorizing legislation: 2EHB 1115 [2015] Sec. 5026 (http://app.leg.wa.gov/billsummary?BillNumber=1115&Year=2015) and **ESHB 2380 [2016] Sec. 5005 (8)** (http://app.leg.wa.gov/billsummary?BillNumber=2380&Year=2015)

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Executive Summary

As our world becomes more and more steeped in technology, educating our students in that and related areas becomes crucial. Science, technology, engineering and math (STEM) education focuses on helping students become the next generation of professionals who will create the new ideas, new products and new industries of the future.

Teaching STEM requires the proper physical space – for many districts, more space than they have. In 2015 the state Legislature established the STEM Pilot Program and allocated $12.5 million for it. Combined with the state's School Construction Assistance Program (SCAP), the intent is to increase the number of STEM lab classrooms, either by modernizing existing classrooms or building new ones.

Districts can receive grants from the program if they show they have a "special housing burden," which is a lack of adequate science and lab space needed for students to meet their graduation requirements.

In establishing the STEM Pilot Program, the Legislature also required the Office of Superintendent of Public Instruction (OSPI) to make recommendations on how the program can be integrated into SCAP. OSPI and its partners created three, which are summarized below and discussed in greater detail throughout this report:

1. Amply fund SCAP.
Two major factors affect the SCAP funding formula. The high school Student Space Allocation (SSA) determines how much physical space each high school student needs to be educated. The Construction Cost Allocation (CCA) determines the State's recognized costs per square foot of construction.

OSPI recommends increasing the SSA from 130 square feet to 165 square feet and increases the CCA to $313.99 in fiscal year 2018 and $323.13 for 2019. That will bring both factors closer to actual needs and costs.

2. Create a STEM literacy grant program.
The typical cycle for modernizing or replacing school facilities is 30 years. But STEM classrooms and labs need to be updated on a shorter cycle. OSPI recommends allocating $20 million to create a new grant program for specialized school facilities needed for STEM literacy. The grant program may allow a school district that has failed bond measures, which need a 60 percent voter approval, the chance for state-funding.

3. Study equipment allowances.
Equipment adds to the cost of creating and modernizing science classrooms and labs. An in-depth study and review of the state allowances for equipment is recommended. This would give valuable data and information about current equipment costs for new and modernized spaces. It also allows for further cost analysis of science classroom and lab spaces.

Introduction

STEM Pilot Program

The Washington State Legislature established the Science, Technology, Engineering, & Math (STEM) Pilot Program in the 2015–17 capital budget (2ESHB 1115 [2015] Sec. 5026) and provided $12,500,000 for this pilot grant program. Grants awarded under this program constitute the districts' local funding for purposes of eligibility for the School Construction Assistance Program (SCAP) to construct or modernize STEM lab classrooms. School districts were eligible to receive grants if they had a special housing burden due to lack of sufficient space for science classrooms and labs to enable students to meet statutory graduation requirements.

The Office of Superintendent of Public Instruction (OSPI) was tasked to administer the grant to school districts with assistance from Washington STEM, a statewide STEM education organization. The 2016 Supplemental Capital Budget (ESHB 2380) further modified the grant program by providing additional grant scoring criteria, and it asked OSPI to develop recommendations on how the pilot program might be integrated with SCAP.

The capital grants were intended to fund the following capital spaces and specialized equipment:

- Additional square footage of classroom space and renovated space devoted to lab learning experiences (including both inside and outside learning spaces).
- Specialized tools, materials, and curriculum for students to conduct lab investigations.
- Ancillary spaces to support teacher collaboration, preparation of lab experiences, storage of STEM materials and tools, and student projects.
- Modular design of spaces, equipment, and equipment storage to facilitate flexible use of existing or new space to accommodate both collaborative student investigations and whole class activities and demonstrations.

Recent Changes to the Graduation Requirements

By 2019, graduating seniors will be expected to complete three science credits, two of which are specified as "lab" credits. This is an increase of one lab science credit from the prior graduation requirements. Meanwhile, the state has adopted new K–12 learning standards in science which, for the first time, include considerable emphasis on engineering and the integration of engineering with natural sciences. The learning standards also call for students to engage in disciplinary practices. That is, as students learn core ideas they will engage in the science and engineering disciplines in ways that approximate the practices of working STEM professionals. Consequently, the emphasis on laboratory science is heightened in K–12 schools, especially at the high school level.

Project Grant Awards

OSPI received 61 individual project applications from 34 school districts statewide. Based on project review by OSPI and WA STEM and distribution requirement in the capital budget, six school districts were awarded STEM Pilot grants (See Appendix B for detailed list). The six district receiving grant funding were Chehalis, Franklin Pierce, Finley, Kettle Falls, Centralia, and Nine Mile Falls to construct and modernize 28 science labs and 9 science classrooms. These projects equate to 52,000 square feet of proposed project scope at a total project cost of approximately $20.8 million. The average cost per square feet of the project funded was approximately $422.

Next Steps

The 2016 Supplemental Capital Budget required OSPI to make "recommendations to establish a STEM grant program within the framework of the school construction assistance program." In preparation for this report of recommendations, OSPI and Washington STEM organized a STEM Capital Stakeholder Group meeting in September 2016 to gather feedback regarding the current STEM Pilot Program and recommendations for future STEM funding. Stakeholders that participated in this meeting included OSPI, Washington STEM, architects, school district officials, legislative staff, the Office of Financial Management, and Office of the Governor. Topics discussed included:

- Overall impressions of the current STEM Pilot Program application process, criteria, and program limitations.
- Appropriate science classroom and lab space needs (square feet) recommendations in relation to Next Generation Science Standards.
- Other space considerations needed when designing science classrooms and labs.
- Estimated total project costs specific to science classrooms and labs, including how these costs compare to non-science classroom and lab project costs.
- Estimated maintenance and technology upgrade costs for the spaces.
- Utilization of these spaces throughout the day and the potential for these spaces to be utilized and shared by other programs such as Career and Technical Education (CTE).
- Brief discussion of Washington STEM's Pilot Project Grant Report and Recommendations (See Appendix A).

Based on input from this stakeholder meeting and other discussions with school district officials, Washington STEM, and the priorities of the Superintendent of Public Instruction, the following are recommendations on how to establish a STEM grant program within the framework of the school construction assistance program.

Recommendations

Recommendation 1: Amply Fund School Construction

New Construction and Major Modernizations for STEM Classroom Space

In order to meet the educational needs for science, technology, engineering, and mathematics literacy, the Superintendent of Public Instruction recommends funding to amply fund the School Construction Assistance Program (SCAP) to provide the needed student space and pay for the associated construction costs to meet current educational standards, which includes science classrooms and science labs.

SCAP provides state funding assistance to local school districts to construct and modernize school facilities based on funding formulas. This recommendation increases two major components of the SCAP funding formula for high school projects, the Student Space Allocation (SSA), which is the amount of square feet per student used to determine projected need of space when multiplied by future school district enrollments, and Construction Cost Allocation (CCA), which determines the State's recognized costs per square foot of construction. The state funds an SSA that has not been increased to reflect the changing program of basic education and increases to the learning standards since 1979, and the CCA is lower than the actual cost of construction. This request will align the SSA closer to the current educational science standards and bring the CCA closer to the actual average cost of construction, which would include science classrooms and labs.

Student Space Allocation (SSA)

The SSA is used to determine the amount of square feet the state will fund when a school facility is constructed or modernized. Eligible area is determined by multiplying a school district's enrollment projection for each grade level by the grade level SSA and subtracting the result from the district's total existing square feet. The calculation for modernization funding takes into consideration other factors such as a buildings age and other improved space.

The SSA is authorized by administrative rule (WAC 392-343-035) and funding levels are set by the Legislature. Below are the current funded SSA levels:

130 square feet per student = Grades 9–12

Current SSA funding levels are not adequate for current educational standards. School districts statewide are building schools at higher square feet per student than funded. Currently, the Legislature is funding the SSA for some grade levels at or below those provided in 1979. The SSA for K–6 and grades 9–12 are at the 1979 funding levels. Grades 7–8 and students with disabilities are funded at a lower level.

1979 SSA Funding Levels

130 square feet per student = Grades 9–12

In order to respond to the need to increase the SSA, OSPI convened a workgroup and consulted with school districts to determine SSA levels which align more closely to the space needed by school districts to meet current educational standards. Based on input from the workgroup and stakeholders, the Superintendent of Public Instruction developed the recommended SSA levels.

Construction Cost Allocation (CCA)

The Construction Cost Allocation (CCA) is the maximum construction cost per square foot used to calculate the amount of state assistance under SCAP and is authorized by administrative rule (WAC 392-343-060). The CCA funding levels are set by the Legislature and the current CCA funding levels are lower than the actual cost of construction. With the CCA being lower than the actual cost of construction, local school districts must pay for the difference between the two amounts. The CCA funding levels need to be increased to reduce the gap between actual costs and the state funded CCA.

Based on actual construction bid costs for school construction projects, Superintendent Dorn has requested an increase to the CCA funding levels in the 2017–19 biennium to the following:

Fiscal Year 2018	$313.99
Fiscal Year 2019	$323.13

Recommendation 2: New Science Classroom and Lab Modernization Grant Program

In addition to requests for increases to the CCA and SSA, the Superintendent of Public Instruction recommends $20 million in funding to provide a grant program for specialized school facilities required for science, technology, engineering, and mathematics literacy. Adequate STEM facilities support interactive, project-based STEM curricula and support the state's new graduation requirements for students graduating in 2019. To achieve expected improvements in STEM literacy, the development and modernization of specialized STEM facilities must occur at a faster pace than the typical 30-year cycle of modernizing or replacing school facilities. This grant program intends to speed up the development and modernization of specialized STEM facilities through the grant program described in this section.

The School Construction Assistance Program (SCAP) provides state funding assistance for new construction, modernization, and replacement of school instructional space. SCAP is designed to accommodate districts experiencing student population growth and to renovate or replace aging facilities after 30 years. This grant program does not provide funding to update facilities for new program requirements or changes in educational requirements outside of the 30-year modernization assistance.

In the 2015–17 capital budget, the Legislature provided funding for a competitive grant program for STEM spaces in K–12 facilities, the STEM Pilot Grant Program, to build and modernize STEM classrooms and laboratories. Grant recipients were allowed to use the

funds as local funding to participate in the School Construction Assistance Program (SCAP). OSPI administered the grant program and received 34 grant applications with total project costs of approximately $77 million. Six (6) projects were funded, totaling approximately $19.2 million (STEM Pilot Grant $12.0 million and SCAP $7.2 million) which created 28 labs and 9 science classrooms.

The STEM pilot program funding drivers limited the size of science classrooms to 1,040 square feet and laboratories to 1,440 square feet and the construction cost per square feet was capped at the current SCAP Construction Cost Allocation of $213.23. However, school districts could build additional square feet at a higher cost using only local and private resources. The STEM pilot program grant funding required local school districts to have at least $100,000 in private donations to receive a grant award. Grant funding was limited to $4 million per school district and each school district was limited to one grant award that could be used at one or more schools.

The STEM grant funding was allowed to be used as local funding to enable school districts to receive additional state funding through the SCAP for their STEM projects. The SCAP funding received was enhanced by increasing the Financial Assistance Percentage by 20 percent of the percentage of students eligible and enrolled in the free and reduced priced meals program, 10 percent for second class school districts, and 10 percent for school districts with funding assistance percentages of more than 50 percent. The resulting enhanced Funding Assistance Percentage ranged from 83 percent to 100 percent. The Legislature limited SCAP funding for the STEM Pilot Grant Program to 15,840 square feet per project and not to exceed 36,880 square feet for all awarded projects.

The large number of applications for the STEM Pilot Grant program funding confirmed school districts statewide need science labs and classrooms. This proposed grant program will provide a streamlined grant program to enable school districts to create this needed space.

Superintendent Dorn's 2017–19 capital budget request proposes to fund a new streamlined grant program which will provide a single source of funds to create or modernize specialized STEM facilities for all schools in need of space to meet the new 24 credit graduation requirement. This new grant program will incorporate lessons learned from the existing STEM Pilot Grant Program and continue its successful outcomes.

OSPI will partner with a non-profit STEM educational organization to evaluate the educational benefits associated with the project. OSPI School Facilities and Organization staff and K–12 stakeholders, who specialize in school facilities issues, will evaluate attributes and feasibility of each proposed project.

Public school facilities serving grades nine through twelve and built or modernized more than ten years prior to the grant application will be eligible. OSPI will use the following criteria to prioritize the grants:

- School districts lacking adequate STEM facilities to meet the 24 credit graduation requirements;
- Age and condition of current classroom space to be modernized;
- Schools with the highest free and reduced price meals program ratios;
- Economic conditions within the district that limit the ability of the district to finance the necessary classroom space from local sources;
- Readiness to proceed; and
- Financial reasonableness based on total project cost per square foot.

Allowable project costs under this grant will include design, construction (renovation/modernization) of existing science labs or classrooms, project management costs, furnishings, fixtures, and equipment (FF&E), and necessary utility and information technology systems upgrades to support specialized STEM facilities.

This new grant program will allow school districts to receive capital funding between the 30-year lifecycle of the facility. This will allow school districts to upgrade technology and equipment. It will allow school districts to provide local funds using capital levy, which requires 51 percent voter approval. It may allow a school district who has failed bond measures, which need a 60 percent voter approval, the chance for state-funding.

School districts receiving state funding for this grant will be ineligible for SCAP state funding for the same space for ten years after the board acceptance of the project as complete.

The new graduation requirements approved by the Legislature and adopted by the State Board of Education requires students graduating in 2019 to earn three science credits, including two credits which must be laboratory science. This new grant program can help provide the necessary science classrooms and labs to support student learning.

This new grant program continues the successful outcomes of the STEM Pilot grant program created and funded by the Legislature in the 2015–17 capital budget. This streamlined grant program would provide a single funding source to create STEM labs and classrooms to enable students to meet the new graduation requirements. Additionally, allowing school districts the ability to receive capital funding between the 30-year lifecycle of the facility to upgrade technology and equipment will allow school districts to provide local funding using capital levy funds, which require a 51 percent voter approval, instead of bonds, which would require a super-majority voter approved.

K–12 students will be provided increased opportunities to receive a rigorous and equal education in STEM statewide. These students will have the opportunity to be better prepared for college and career opportunities. Students entering the career world will be more qualified to start in higher-paying positions. Local businesses will benefit by having a highly-qualified workforce.

K–12 students will have a greater opportunity to receive a rigorous and equal STEM focused education statewide. These students will have the opportunity to be better prepared for college. This should reduce the need for remediation courses below college-level at the state's institutions of higher education.

Recommendation 3: Furniture, Fixtures and Equipment (FF&E) Study

The STEM Pilot Grant Program provided grant funding for the purchase and replacement of science equipment that can add substantially to the cost of creating and modernizing science classrooms and labs. Under SCAP, furniture, fixtures and equipment (FF&E) funds are awarded as an allowance (WAC 392-343-095) and the cost of these purchases are added to total construction costs of an approved school facilities project. The amount of state funding assistance for which a district is eligible shall be the eligible square foot area of the project multiplied by the construction cost allocation for the fiscal year funded and that product multiplied by:

a) Two percent for elementary schools;
b) Three percent for middle and junior high schools;
c) Four percent for high schools;
d) Five percent for facilities for students with developmental disabilities;
e) Five percent for inter-district cooperative occupational skill centers; and
f) Seven percent for inter-district transportation cooperatives.

The Superintendent of Public Instruction recommends an in depth study and review of the current FF&E allowances in WAC 392-343-095, compared to actual FF&E costs for school construction projects. This study would provide valuable data and information regarding current FF&E costs for all new and modernized spaces, and allow for further cost analysis comparisons of science classroom and lab spaces as well.

APPENDICES

Appendix A: Washington STEM Report

WASHINGTON STEM

STEM PILOT PROJECT GRANT REPORT + RECOMMENDATIONS AUGUST 2016

BACKGROUND + OVERVIEW

The 2015-2017 Washington State Legislature established the STEM Pilot Project Grant (the Pilot) with $12 million in capital funding to provide under-resourced school districts the funds to construct or modernize science lab learning spaces. Many schools in Washington struggle to meet the 2013 Washington State Science Learning Standards in their existing facilities and even more will be challenged to meet the new class of 2019 graduation requirements of three science credits, two of which must be for lab sciences. The Pilot aimed to address these challenges by awarding innovative facility plans that were tightly linked to powerful STEM learning experiences for students.

Washington STEM was contracted to manage the grant review and selection process in partnership with OSPI. The Pilot grant process began with the release of a request for proposal (RFP) in November 2016 and concluded with the final selections being made in May 2016. Each proposal was reviewed by a team that collectively brought deep sector knowledge in STEM content, instructional practices, and/or facility design, and finalists participated in onsite or phone follow-ups. For a full list of reviewers, refer to Appendix A. Six school districts were ultimately awarded, utilizing the $12 million from the STEM Pilot Project Grant and about $7.2 million through the School Construction Assistance Program (SCAP).

In total, 34 districts submitted proposals including 62 unique projects for a total ask of $130 million. This gap between money available and money requested indicates a strong need for capital investments in STEM learning spaces throughout the state.

This report includes a description of the grant purpose, parameters, and process, as well as an analysis of the key insights and challenges to inform recommendations supporting a viable STEM capital grant program within the framework of SCAP.

GRANT PURPOSE, PARAMETERS + PRIORITIES

Educators across Washington are charged with preparing students to meet future workforce demands by providing high-quality STEM experiences for all students in K-12. The Washington State K-12 Science Learning Standards call for students to practice science and engineering by investigating natural systems and designing and testing solutions. Schools are organizing the curriculum to meet new standards now, and students will face state assessments based on these new standards beginning in 2018. In addition, by 2019, high school graduates will be expected to complete three science credits, two of which must be in lab sciences. These monumental shifts in what students are expected to know and do require significant changes in how teachers engage students, the tools and materials they use, and the way spaces are designed to accommodate such learning.

The 2015-2017 Washington State Legislature established the STEM Pilot Project Grant with $12 million in capital funding to provide under-resourced school districts the funds to construct or modernize science lab learning spaces. Below is a list of the notable parameters and priorities of this grant. For a full list of eligibility requirements and conditions of the grant, reference Appendix B, Report to the Legislature: STEM Pilot Project Grant Program, prepared by OSPI.

GRANT PARAMETERS

The following is a subset of the grant parameters, as designated in the Engrossed Substitute House Bill 2380.

- Each school district is limited to one grant award, which may be used for more than one school facility within the district.
- Grant requests may not exceed $4M per district.
- Eligible area for STEM pilot projects is 1,440 square feet per science lab or classroom combination, or both; and 1,040 square feet per science classroom. Total eligible area per STEM pilot project must not exceed 15,840 square feet, and total eligible area of all STEM pilot projects from this section must not exceed 36,880 square feet.
- Awards must be distributed geographically to include at least one educational service district (ESD) in the Puget Sound region (ESDs 114, 189, and 121), two districts East of the Cascades (ESDs 171, 105, 101, and 123), and at least one district in the Southwest region (ESDs 113 and 114) that currently offers curriculum using equipment called Real-Tim PCR and a scanning electron microscope to build partnerships with academia and industry leaders to develop in-depth research projects.

GRANT PRIORITIES

The review criteria were intended to equitably distribute available funds to schools most in need and/or best prepared to use the funds as intended. Specific consideration was given to the following factors:

- Established need as defined by:
    - Percent of students who qualify for and are enrolled in the free and reduced-price meal program;
    - The extent to which existing facilities cannot accommodate the 2019 graduation requirements; and
    - The lack of ability to raise funds through levies or bonds in the prior 10-year period.
- Ability to secure a match of no less than $100k in cash, like-kind, or equipment
- Demonstration of qualified STEM teachers (existing or a clear plan to recruit or train)

APPLICANT DATA

Overall, 34 districts submitted proposals including 62 discrete projects with a total request of $130M. The proposed projects indicated a diversity of needed upgrades across regions of the state.

- **Regions**. 11 proposals were received from east of the mountains, 15 from the Puget Sound region, and 8 from the Southwest region.
- **Request Amounts**. Requests ranged from $200k to $6.3M, plus one outlier at $47M. The median request was $2.5M (21 percent of the available amount).
- **Projects per District**. Proposals included between one and eight projects, with a large majority (85 percent) including just one or two.
- **Bond Information**. 15 of 34 districts have not passed a bond within the last 10 years. 14 districts have passed a bond within the last five years, one of which is among the six award recipients. The original language in the proviso stated "a district's ability to raise funds through levies or bonds in the prior ten-year period", as a criterion of eligibility.
- **Evidence of Poverty**. 45 percent of students in Washington are eligible for and enrolled in the free and reduced-price meal program. The range reported by applicants was 16.7 percent to 98.2 percent.
- **Proposed Square Footage**. While most applicants proposed classroom and lab space at the maximum eligible sizes noted in the proviso, 35 percent proposed spaces that exceeded the science lab limitation of 1,440 square feet. Among them was an average request of 2,200 square feet and an argument for the need to have larger, more flexible space designed to accommodate maker spaces, shops for wood and metal fabrication, aerospace manufacturing, and engineering design.

RESULTS

Following is a summary of the six STEM Pilot Project Grant awards. Collectively, these awards will serve to build or renovate 34 unique STEM learning spaces serving close to 4,000 students across Washington. Each district presented both innovative facility plans tightly linked to powerful STEM learning experiences for students and commendable support from their respective communities. Community support included contributions towards the private match requirement and/or commitments to partner with schools to provide STEM challenges and experiences relevant to their local economy. They also made strong cases for the needs in their districts, aligned with the priorities of this grant. The percent of students eligible for free and reduced-price meals ranges from 30 percent to 74 percent, with three being over 70 percent. Three districts have not been successful in raising funds through bonds or levies since the late 1990's, and one district has no history of receiving bond or levy funds. This grant award could not have come at a better time, and it is sure to have a lasting impact on the quality of STEM education available to the students these schools serve.

Centralia High School, Centralia School District

Southwest Region | New Construction | $3,616,403

Centralia will build a new standalone science facility with eight science classrooms, four of which will be fully equipped science lab spaces that match the integrity of their notable molecular biology program.

Kettle Falls High School, Kettle Falls School District

East Region | Modernization | $1,628,517

Kettle Falls will improve existing science lab facilities and convert an outdated metal shop into a maker space where students can safely design, create, test, and produce engineering projects.

Lakeside High School, Nine Mile Falls School District

East Region | New Construction | $1,242,832

Lakeside will add a new building with two fully-resourced science labs and a shared stockroom for safe storage. The building design will provide the space for students to engage in robust engineering challenges.

River View High School, Finley School District

East Region | New Construction + Modernization | $2,898,047

River View will renovate an existing shop, classroom, and two greenhouses while building a new wood and metal shop and two CTE classrooms. These spaces will make it possible for students to explore animal science, floriculture, horticulture, 3D printing, and bio-technology.

Washington High School, Franklin Pierce School District

Puget Sound Region | New Construction | $4,291,320

Washington High will build a state-of-the-art STEM classroom and lab space to offer courses such as Aerospace Manufacturing and Composites, Principles of Engineering, Introduction to Engineering Design, Medical Interventions, Human Body Systems, and Principles of Bio-Medicine.

W.F. West High School, Chehalis School District

Southwest Region | New Construction | $5,520,948

W.F. West will build a new STEM wing that includes six science lab classrooms specially designed to engage students in an array of advanced STEM learning experiences like building robots, DNA profiling and genetic testing, and examining 3D cell structures, using a new scanning electron microscope.

GRANT REVIEW PROCESS

While Washington STEM worked in partnership with OSPI throughout the grant process, this section will focus specifically on the review phase of the process since this is where the key insights and challenges described in this report arose. For a complete timeline of events, reference Appendix B, Report to the Legislature: STEM Pilot Project Grant Program, prepared by OSPI.

The four-month review phase began when the application closed on January 28, 2016, and ended when OSPI announced preliminary awards on May 11, 2016. During this time, Washington STEM recruited and trained a peer review panel of twelve experts in STEM content, instructional practices, and/or facility design, who served on four separate panels. After completing individual reviews, the full panel was brought together for a day to calibrate on their review scores and qualitative analysis of each proposal. Washington STEM and OSPI co-facilitated this session to ultimately produce an agreed upon, rank-ordered list of proposals and clarifying questions for districts. Washington STEM then conducted site visits or follow-up phone calls with top ranked applicants for further clarification and additional vetting against the priorities. On March 22, 2016, Washington STEM submitted a list of prioritized recommendations to OSPI that included eight finalists, all of which met the original grant criteria and conditions.

On April 18, 2016, the Engrossed Substitute House Bill 2380 was enacted, which included modifications to the criteria and conditions of the STEM Pilot Project Grant. These changes required Washington STEM to reprioritize the list of recommendations to meet the new requirements. This reprioritized list was submitted to OSPI on April 20, 2016, who then conducted a thorough review of project scope and budgets. Award recipients were officially notified on May 11, 2016.

INSIGHTS + CHALLENGES

As a non-governmental entity charged with managing The Pilot grant review and selection process, and as a strong advocate for STEM education across the state, Washington STEM is in a unique position to offer insights regarding the grant process and recommendations for moving forward. We believe that funding for innovative STEM learning spaces is a critical component in the successful implementation of the Next Generation Science Standards so that students are future ready and well prepared to enter STEM related fields. What follow are key insights and challenges of the STEM Pilot Grant Project as it currently stands.

STEM SUCCESS THROUGH STRONG PARTNERSHIPS

Strong partnerships were critical to the success of this program. District proposals that rose to the top reflected key insights from staff with teaching and learning expertise as well as those with facilities expertise. Together they were able to develop clear plans for science classrooms and labs that reflected alignment of more comprehensive STEM learning goals and facility design.

Likewise, there were many benefits to the partnership between Washington STEM and OSPI when administering the review process and determining award recipients. The facilities team at OSPI brought deep expertise in facility design, feasibility, and school construction policy while the Washington STEM team brought knowledge in STEM learning and the supports teachers need to make effective use of STEM tools and materials. In the end, both parties agree that this program will have a lasting impact in the six schools that were selected, their communities, and most importantly, for their students and can serve to inform future investments.

HIGH DEMAND FOR A STEM CAPITAL GRANT PROGRAM

The Pilot demonstrated that a clear need exists for improved science classroom and lab facilities across the state. In just under three months, 34 proposals were submitted including 62 unique projects with a total ask of $130M. The photographic and narrative evidence of inadequate lab and classroom space was compelling, including limited or no access to water, gas, electrical outlets, and basic safety features. Given the short time frame that schools had to prepare proposals, it is safe to assume that the need for improved science facilities exists far beyond what was represented in this pool of applicants.

KEY CHALLENGES

The Pilot was successful in that six, low-resourced schools received funding to improve STEM learning experiences for students. In addition, it provided an opportunity to test a process in order to make

recommendations that will ultimately strengthen the program moving forward. District leaders devoted a large amount of time and resources, in short order, to produce proposals that met the guidelines in the original RFP. The following challenges were consistently named by applicants, following award announcements, and served to inform the recommendations provided in this report.

- The lack of clarity around grant guidelines and constraints, specifically those that defined the target audience (e.g. target range for the percent of students qualifying for free and reduced-price meals, all schools or high school specifically)
- Square footage limitations did not match the needs and vision for future STEM learning experiences
- Late changes in the proviso (approved in April 2016) disrupted the review process, causing a last minute reprioritization of finalists based on new guidelines that applicants were not aware of when preparing their proposals. The most notable changes included:

    1. The parameter that one district from the Southwest region must be awarded was modified to state that at least one grant award must be made to school districts located in southwest Washington that currently offer curriculum using equipment called Real-Time PCR and a scanning electron microscope.
    2. Total square footage allowed was capped by stating that the total eligible area for all STEM pilot projects must not exceed 36,880 square feet.
    3. OSPI must award no less than six and no more than eight grants.

    The net consequences of these late changes were considerable, shifting the results for four districts. Three of the affected districts who had previously been identified as finalists were bumped from the list and one district (which had not originally been identified as a finalist) was ultimately awarded.

RECOMMENDATIONS

The STEM Pilot Project Grant first and foremost confirmed there is a strong need to improve the state of science classrooms and laboratories in schools across the state. The decision to expedite funding to schools through this grant, under the School Construction Assistance Program (SCAP), provided much needed support to six schools and spurred 56 additional schools to assess the current state of their facilities and develop a vision for what it would take to provide the high-quality STEM experiences their students need to meet future workforce demands.

Districts have a vision of the courses they need to offer and the experiences they need to provide for their students to meet more rigorous science and engineering learning standards; however, they often lack adequate space and facilities to fulfill their vision. As districts look ahead to 2019 graduation requirement of three science credits, they anticipate greater demand for science classrooms and labs.

Washington STEM offers the following recommendations in support of a STEM capital grant program within the framework of SCAP. These recommendations were formed through Washington STEM's deep engagement during the review process, in partnership with OSPI, and through feedback received from grant recipients as well as those who did not receive funding.

STEM CAPITAL GRANT PROGRAM RECOMMENDATIONS

- **SCAP Budget Formula**: Revise the project budget formula to ensure that amounts allocated to SCAP are aligned with the true costs of supporting 21st century STEM learning. Spaces designed to accommodate more authentic engineering design practices (e.g. maker spaces, wood and metal shops, robotics) were often larger than the space eligible under this grant (1,040 sf for science classrooms and 1,440 sf for science labs). These larger spaces are flexible and can be used for multiple purposes, making it possible for schools to offer a wider variety of STEM courses. In addition, adjustments need to be made to reflect current costs of construction, labor, and procurement and maintenance of relevant equipment and technology.

- **Grant Guidelines**: The program requirements and priorities should be clearly articulated in the initial RFP to ensure a clear, efficient process. The following examples represent consistent themes in the feedback received from reviewers and applicants.
    - Position this program as an opportunity to serve high needs schools with innovative facility designs. While some proposals more squarely fit into one category or the other, several successfully demonstrated both, ensuring a final product built for future STEM needs.
    - If square footage constraints exist at both the room and building levels, they should both be stated in the RFP to guarantee proposed projects are within scope.
    - Eligible square footage should include ancillary spaces like hallways, bathrooms, and entries, to avoid complications when determining how self-contained building projects (that require these spaces) are fully funded.
    - If priority regions exist, they should be clearly defined in the RFP. These definitions could be based on ESD, county, or district lines – they just need to be clear.
    - Clearly state whether the grant is intended to prioritize high school projects or if all school buildings are to be considered equally. Given the focus on graduation requirements, some believed that priority would be given to high schools while others believed they could be equally competitive by proposing projects for elementary or middle schools to demonstrate the value of clear pathways for students.
- **Public Private Partnership**: Consider reframing the match to cover a percent of the total project budget as opposed to a flat amount. Smaller districts in low-resourced communities struggled to meet the match of $100,000 and in many cases their projects were significantly smaller than those proposed by larger districts in well-resourced communities. It would also be helpful to clearly state when the funds need to be secured (when submitting the application or one month post-award, for example). This would allow districts to craft more clear expectations for their private partners.
- **Bond Passage**: Consider revising the priority given to districts based on their lack of ability to raise funds through levies or bonds in the prior ten-year period. The ability to garner community support to fund school improvements should be seen as an asset. There were a few examples of low-income communities that do rally support for bonds, but those bonds aren't large enough to provide what is actually needed to improve STEM facilities or they are only able to accomplish one small project at a time.

We look forward to working with OSPI and the State Legislature to ensure the continuation of this important and valuable program. For questions about this report and for more information please contact Amanda Fankhauser at amanda@washingtonstem.org.

APPENDIX A | Peer Reviewers

- **Kareen Borders** | Director of STEM Programs and Outreach | **Olympic ESD 114**
- **Clarence Dancer** | STEM Program Supervisor | **Office of Superintendent of Public Instruction**
- **Ellen Ebert** | Director of Science | **Office of Superintendent of Public Instruction**
- **Jacquelyn Erinne** | Engineer | **Federal Aviation Administration**
- **Lauren Fruge** | Senior Program Manager | **McKinstry**
- **Dan Gallagher** | Science Program Manager | **Seattle Public Schools**
- **Megan Innes** | Digital Learning | **Museum of Flight**
- **Jason Medeiros** | Lead Designer & Science Teacher | **Outdoor Classroom Design**
- **Asopuru Okemgbo** | Senior Research Consultant | **Skills Development Mission, Inc**
- **Liza Rickey** | Teacher | **Newcastle Elementary**
- **Kirk Robbins** | Science & Engineering Education Consultant | **Independent Science Education Consultant**
- **Gilda Wheeler** | Senior Program Officer | **Washington STEM**

APPENDIX B | Report to the Legislature: STEM Pilot Project Grant Program

See attached.

Appendix B: STEM Pilot Project Grant Awards

Region	District	Science Classrooms	Science Labs	Square Feet	Estimated SCAP Funding	Allocated STEM Grant Funding	Total Grant	Description
Southwest	Chehalis	6	2	10,720	$1,898,150	$3,622,798	$5,520,948	Build a 13,164 square foot STEM wing at W.F. West High school to include 6 science lab classrooms including a robotics/engineering lab, a cell culture lab, biology, chemistry and molecular genetics labs (R-T PCR & scanning electron microscope) and 2 science classrooms.
Puget Sound	Franklin Pierce	5	0	6,845	$1,425,406	$2,865,914	$4,291,320	Renovate an existing building (4,232 sf) and construct an addition (2,613 sf) to provide state-of-the-art STEM classroom/lab space. Very creative use of space that captures cross-disciplinary instruction. Courses offered will include: Aerospace Manufacturing and Composites, Principles of Engineering, Intro. to Engineering Design, Medical Interventions, Human Body Systems, Principles of Bio Medicine, etc.
East WA	Finley	7	0	10,080	$2,149,358	$748,689	$2,898,047	Modernize existing shop and classroom and add new construction to create a separate wood shop and metal shop, 2 CTE classrooms, and 2 greenhouses. Courses offered will include: STEM science, 3D printing, engineering development, Bio-tech lab, Animal Science, Floriculture, and Horticulture Science.
East WA	Kettle Falls	4	3	5,625	$1,056,448	$572,069	$1,628,517	Convert underutilized metals shop into a Maker Space/Fabrications Lab to more safely design, fabricate, test, and produce engineering projects. They will also renovate an existing lab used for Biology, Chemistry, and Human Biology.
Southwest	Centralia	4	4	9,920	$184,106	$3,432,297	$3,616,403	Construction of a new stand-alone science facility including eight new science

Region	District	Science Classrooms	Science Labs	Square Feet	Estimated SCAP Funding	Allocated STEM Grant Funding	Total Grant	Description
								classrooms, four of which are to be fully equipped combination science lab/classroom spaces.
East WA	Nine Mile Falls	2	0	2,659	$509,600	$733,232	$1,242,832	Adding a 2,659 sf modular building that will house 2 lab classrooms and a shared stockroom. Classrooms are not currently equipped to support chemical or heat related learning opportunities, so new classrooms will be equipped with water, air, gas, technology, and appropriate electrical access.
Total		28	9	45,849	$7,223,068	$11,974,999	$19,198,067	

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