Portland Public Schools

2017 Bond Performance Audit

Performance Audit – Fiscal Year 2018/2019
Final Report: 2017 Bond Cost Estimates

April 2019

SJOBERG EVASHENK CONSULTING, INC

455 Capitol Mall • Suite 700 • Sacramento, California • 95814 • Tel 916.443.1300 • www.secteam.com

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REPORT HIGHLIGHTS

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RESULTS

Given the complexity of capital construction projects, accurate cost estimates built on sound methodologies are critical to reduce risks of cost overruns, minimize potential gaps in funding, prevent scope reduction, and keep promises made to voters. At Portland Public Schools (PPS), initial cost estimates used to develop the 2017 Bond were supported by professional estimates and empirical data. However, final cost estimate figures presented to the Board of Education (Board) were based on assumptions that were too low and a formal documented methodology did not exist to substantiate cost factors that were lower than market conditions at that time. Yet, it is still early in the 2017 Bond cycle and there are opportunities, to some extent, to make cost adjustments through in-progress value engineering efforts as well as refinements in internal practices to achieve program efficiencies and cost savings. However, because of the scale of the budgetary gap, efforts will also need to involve decisions about eliminating scope or delaying promised projects to subsequent bond cycles.

BACKGROUND AND PURPOSE

On May 16, 2017, Multnomah County voters approved a $790 million School Building Improvement Bond (2017 Bond) to fund renovations at Benson and Madison High Schools, rebuilds at Lincoln High School and Kellogg Middle School, and a variety of health and safety projects at schools within the PPS District. Specifically, the 2017 Bond funds were allocated as follows:

- $580 million in school projects;
- $150 million of health and safety projects; and
- $60 million for program management and contingencies.

In October 2018, PPS hired Sjoberg Evashenk Consulting to conduct performance audits of the 2012 and 2017 Bond projects. As requested by the PPS Board, this first audit scope focused solely on the development of cost estimates supporting the $790 million bond budget figure.

KEY FINDINGS

- While a consistent process was employed, a formal, documented methodology to guide the development of the 2017 Bond budget at $790 million did not exist; however, independent professional cost estimates supported $403.5 million of the $580 million in school project hard costs and $45 million of the $150 million for health and safety projects.
- Total cost estimates for the school projects initially prepared by Office of School Modernization (OSM) operational staff generally aligned with market factors, although OSM executive leadership at that time subsequently adjusted cost factors to a lower range when compared to market conditions and with similar bonds passed at other school districts in Oregon, Washington, and California. In total, former OSM executive leadership reduced initial total project cost estimates proposed by OSM operational staff by nearly $100 million without a documented methodology, rationale, or explanation.
- Similarly, assumptions used by OSM executive leadership in 2017 to arrive at the $60 million budget for program-level costs were generally low when compared with the 2012 PPS Bond and other school districts reviewed.
- Pre-bond cost estimate information provided to the Board aligned with other districts; however, additional information could have increased clarity for decision-makers and transparency to the public.
- PPS is working on containing costs in light of rising project cost estimates. With only $50.8 million in expenses incurred through December 2018, Bond partners will need to exercise continued vigilance to ensure the program stays within current budgetary constraints.

CONCLUSIONS

Current OSM executive leadership and operational staff asserted that significant changes to cost estimation practices have been made since the 2017 Bond passed and issues identified in this audit report have already been addressed.

Since the scope of this audit was limited to assessing the development of cost estimates for the $790 million Bond in 2017, we will verify whether OSM current efforts and practices have addressed issues and recommendations noted from this audit as part of future bond performance audit cycles.

Introduction and Background

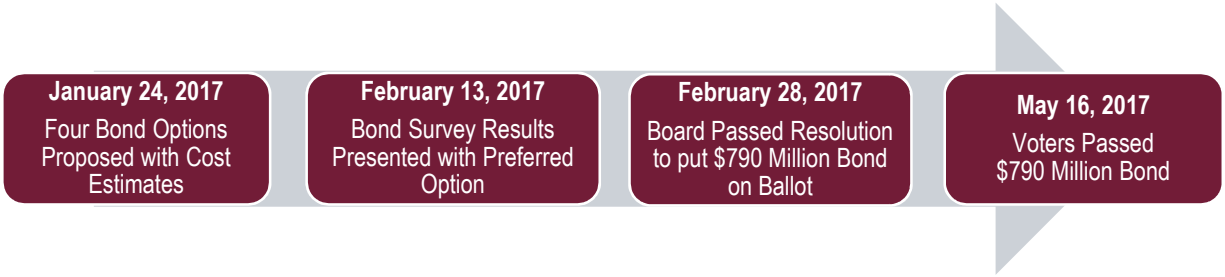
With the age of Portland schools averaging 77 years old, a citizens committee recommended that Portland Public Schools (PPS) engage in a series of school construction bonds to upgrade all PPS schools over a 30-year period to remedy building deficiencies and modernization of learning environments—thus, bringing schools up to current building code and educational standards. [1]

Bond Development

In 2012, Portland voters passed a $482 million bond to pay for the first phase of its school construction efforts through a levy against assessed property values. Schools improved in the 2012 Bond included Grant, Franklin, and Roosevelt High Schools and Faubion Middle School in addition to a series of building improvements at other district schools. This was the first construction bond passed by voters since 1995.

Subsequently, facilities testing revealed growing issues at district schools related to lead, roofing, and fire safety systems. Thus, in 2016, PPS began efforts to propose a 2017 Bond measure to fund another series of health and safety projects in addition to modernization of three high schools and one middle school. PPS enlisted external bond consultants and a Bond Stakeholder Advisory Group to poll likely voters about passing a proposed bond and determining preference on scenarios for spending bond proceeds. [2] Further, PPS Office of School Modernization (OSM) executive leadership and staff developed cost estimates for the various proposed bond options, with the assistance of professional cost estimators, to present to the PPS Board of Education (Board) for approval as shown in Exhibit 1.

EXHIBIT 1. 2017 BOND DEVELOPMENT TIMELINE



Sources: Board meeting materials from January 24, 2017; February 13, 2017; and February 28, 2017; and 2017 Multnomah County Election Pamphlet.

2017 Bond Provisions

On May 16, 2017, Multnomah County voters approved Measure 26-193, the largest Bond in state history at $790 million, backed by a levy rate of $0.68 per $1,000 of assessed property tax value over 30 years. [3] The

[1] According to the Proposed Health, Safety and Modernization Bond Frequently Asked Questions published on the PPS website, some schools were built more than 100 years ago and more than half were built before 1940. Before the prior 2012 Bond, only two schools had been built in the last 35 years.

[2] The Bond Stakeholder Advisory Group was formed to provide feedback to the Board in preparation for the 2017 Bond and consisted of individuals from the local community.

[3] The levy rate was estimated at $1.40 per $1,000 for the first four years, declining thereafter.

measure funded $580 million in renovations at Benson and Madison High Schools and full rebuilds of Lincoln High School and Kellogg Middle School, as well as $150 million for a series of health and safety projects improvements at other schools in the PPS District. Approximately one-third of the budgets for each high school and middle school project also included funds to address health and safety issues at those specific schools as well. Funding was also set aside to provide master planning for future capital upgrades and improvements of Cleveland, Jefferson, and Wilson High Schools as part of $60 million in program contingency and program management as shown in Exhibit 2.

EXHIBIT 2. 2017 KEY COMPONENTS OF $790 MILLION BOND

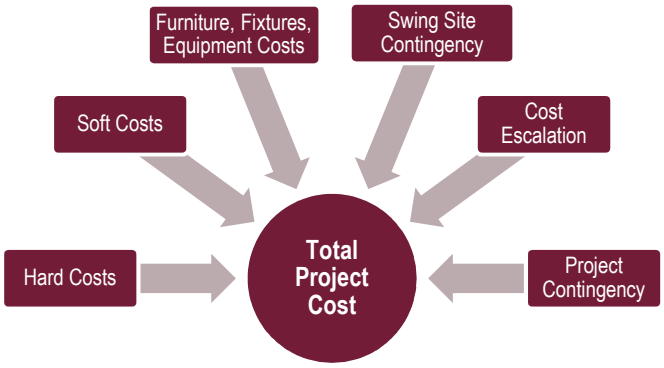
$790 Million Bond		
$580 million **School Capital Projects**	**$150 million** **Health & Safety Projects**	**$60 million** **Program Management & Program Contingency**
Rebuilding or Modernizing: (1) Benson HS (2) Kellogg MS (3) Lincoln HS (4) Madison HS	• ADA • Asbestos • Fire Safety • Lead-based Paint • Radon • Roofs • Security Systems • Water Quality	Included items such as: • PPS Personnel Costs • Fees for Program and Construction Management Consultant and Architects • Master Planning for Future Schools

Source: January 24, 2017 Board of Education Handout, 2017 Multnomah County Election Pamphlet, and Bond Program Budget Overview.

School Capital Project Cost Components

Given the complexities of capital improvement projects, there are multiple cost components associated with the planning and construction of school buildings. Projects will have costs associated with design and construction activities as well as contingencies for unforeseen needs that may occur during a project. At PPS, costs for the design and construction of school capital projects were captured in six primary categories as shown in Exhibit 3.

EXHIBIT 3. TOTAL PROJECT COST COMPONENTS



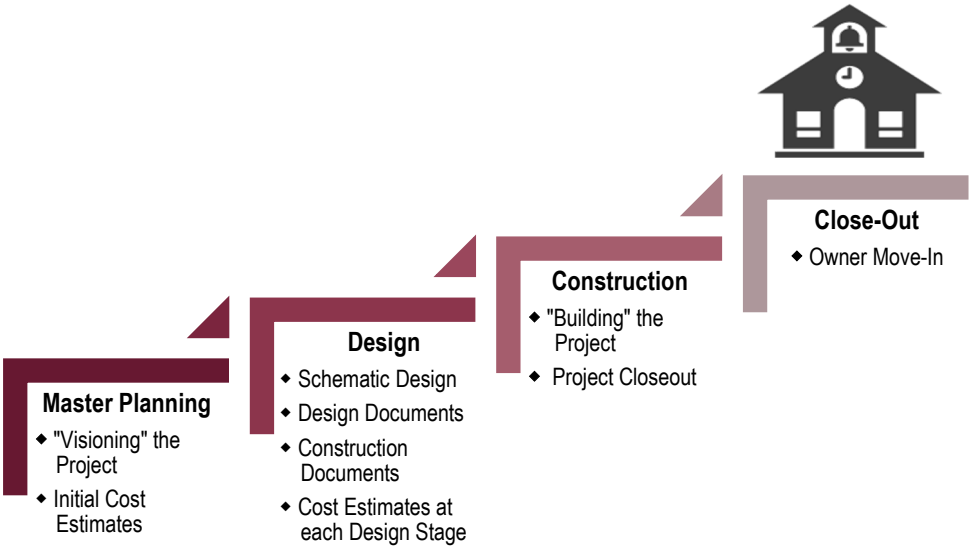
Source: Auditor-generated based on internal PPS Budget Development Worksheets and Data.

Project hard costs include the actual physical construction on the school site such as contractor labor, site equipment, materials needed, and utilities costs, while project soft costs typically include design costs related to architecture and engineering services as well as other costs such as permits, fees, and inspection services. Additional project costs are added for interior school furniture, fixtures, and equipment (FF&E) such as desks, filing cabinets, technical equipment, and trade fixtures as well as possible swing site contingencies to capture costs associated with setting up a temporary school environment, if needed, while renovations are implemented. Another standard component of a project cost is the addition of an escalation factor—both a percentage for expected increases to the cost of construction as time passes as well as the number of years that escalation growth would be applied. Finally, typical project costs also establish a project contingency factor percentage or dollar amount for unforeseen conditions that surface as design and construction services are delivered. Combined, these costs represent the total cost to deliver a project. During master planning and design phases, project cost components and estimates are regularly refined and adjusted with updated data on changing market conditions, design drawings, and site conditions.

School Capital Project Delivery Phases

Planning and implementing a capital construction project is a complex endeavor with several different phases and many different players involved at each phase. Exhibit 4 illustrates the primary phases of a capital improvement project including master planning, design, construction, and close-out.

EXHIBIT 4. KEY PROJECT DELIVERY PHASES



Source: Auditor-generated based on interviews, process walk-throughs, observations, and documentary review.

Health and Safety Projects

Prior to the bond passage in May 2017, PPS testing showed 99 percent of schools had at least one water fixture with lead above acceptable federal levels, roofs were beyond their useful life and leaking, and fire safety systems were insufficient or did not include sprinkler systems. Technical staff in PPS' Facilities and Asset Management (FAM) worked in collaboration with external experts to assess school health and safety needs and estimated cost of mitigation could total approximately $1.6 billion.

To address these needs and mitigate deficiencies, PPS believed it was more cost effective to address health and safety needs as part of full school rebuilds or modernizations following timelines established in its 2012 Long Range Facilities Plan. Thus, for the 2017 Bond, $174 million in health and safety improvements were included as part of the $580 million capital project cost estimates for Benson High School, Lincoln High School, Madison High School, and Kellogg Middle School. [4]

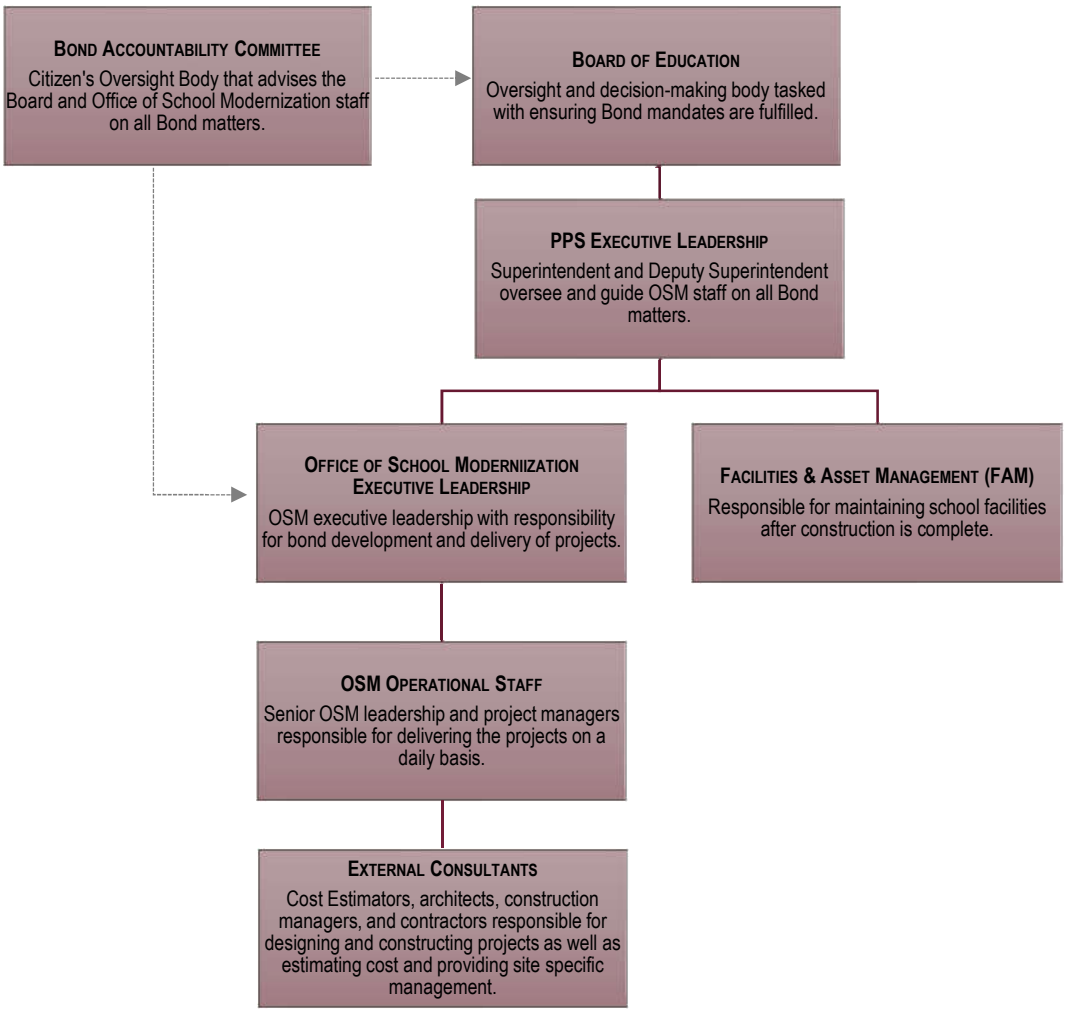
Additionally, PPS believed they had capacity to mitigate additional health and safety deficiencies at other schools within the PPS District. At the same time, however, there was a practical limit to how much construction work could be accomplished during the bond investment cycle due to the availability of skilled construction workers and the limited timeframe available to complete work while students are out of school—a period of approximately 60 days over school summer break. As part of the 2017 Bond, another $150 million was set aside to resolve health and safety concerns at schools across the district.

Bond Partners

As the largest school district in Oregon and one of the largest in the Pacific Northwest with more than 49,000 students and approximately 80 schools, PPS administers capital improvement projects and maintains school buildings. Within PPS, OSM is primarily responsible for the administration, management, and implementation of the 2012 and 2017 Bonds. To assist in these responsibilities, there are a number of internal and external Bond Partners involved as well as oversight provided by a citizen's Bond Accountability Committee (BAC) and the Board as shown in Exhibit 5. However, while the BAC and Board have responsibility as part of overall bond delivery and oversight, they were not involved with the development of project and bond cost estimates.

[4] The $174 million set aside for health and safety improvements at the four schools—Lincoln, Madison, Benson, and Kellogg—were incorporated into total project cost estimates for those schools totaling $580 million.

EXHIBIT 5. KEY BOND PARTNERS



Source: Auditor-generated based on interviews, process walk-throughs, observations, and documentary review.

Note: Exhibit reflects structure at the time the 2017 Bond was developed.

Scope and Methodology

PPS hired Sjoberg Evashenk Consulting in October 2018 to conduct annual performance audits of the 2012 and 2017 School Improvement Bonds over a four-year period. To establish the initial annual work plan and audit objectives, Sjoberg Evashenk Consulting interviewed PPS executive leadership and operational staff, and stakeholders; gathered and reviewed initial documents; and performed a high-level risk assessment.

For 2018, the performance audit will focus on the period between April 1, 2017 and March 31, 2019 and on several objectives such as reviewing cost estimates, determining the delivery status of all projects and programs, assessing strengths and weaknesses of PPS program oversight, testing specific project management practices and challenges, and comparing results to Bond delivery goals, construction industry leading practices, and other school districts, where practical and data available.[5]

Results will be reported in two separate audit reports in 2019. The first performance audit report will have a primary objective on attempting to identify the basis for setting the 2017 Bond budget at $790 million as requested by the PPS Board.[6] To meet that objective, SEC performed a variety of audit tasks including the following.

- Conducted in-depth interviews with key personnel including, but not limited to current Superintendent and Deputy Superintendent business and operations, current Chief Operating Officer, current Senior Director Office of School Modernization, current Senior Director Environmental Health and Safety, school projects senior and assistant project managers, construction managers, Senior Bond Financial Analyst, PPS staff responsible for procurement, public records, information technology, human resources, facilities and asset management, and key consultants including architects and professional cost estimators to understand and assess methodologies, activities, worksheets, tools, context, and models employed to develop the 2017 Bond estimates.
- Analyzed and assessed documents including, but not limited to, cost estimate worksheets and PowerPoint presentations, long range facilities plan, professional cost estimations, architect due diligence reports, Primavera schedules, budget data maintained in PPS' e-Builder system, and high-level internal budget development documents, in addition to Board agendas, meeting minutes, videos, and meeting materials between September 6, 2016 and February 5, 2019.
- Compared PPS Office of School Modernization (OSM) cost estimation practices, assumptions, and amounts regarding project costs, contingencies, escalation, and program management to industry standards where available and other school districts in Oregon, Washington, and California.

[5] Industry best practices were drawn from a variety of sources including the Construction Management Association of America (CMAA) Construction Management Standards of Practice, Project Management Body of Knowledge (PMBOK) Construction Extension, and Sjoberg Evashenk Capital Construction Program Audit Library.

[6] The second performance audit report will be issued later in 2019.

- Analyzed master planning documents, due diligence reports, professional cost estimates, schematic designs, design development documents, and construction documents related to Lincoln, Madison, and Benson High Schools as well as Kellogg Middle School.
- Worked with PPS Information Technology to run queries of employee-specific computer drives and Google drives. Analyzed results of key word search parameters related to the bond, cost estimates, contingencies, budget development and models, project costs, cost estimators, and architects for specific schools from files of past and present employees involved with 2017 Bond estimates.
- Reviewed results from email search queries performed as part of a two-year public records request containing more than 6,000 pages as well as a 78-page bond fact finding email search.
- Researched all PPS Board agendas, meeting materials, minutes, and audio between September 6, 2016 and February 5, 2019 as well as the Bond Accountability Committee meeting minutes and progress reports between October 19, 2016 and January 19, 2019.
- Reviewed publicly available meeting agendas, materials, videos, and meeting minutes to understand and compare other school districts' information presented to their respective Boards prior to passage of similar bonds for the following school districts:
    - Beaverton, OR School District
    - North Clackamas, OR School District
    - Eugene, OR School District
    - Salem-Kaiser, OR School District
    - Vancouver, WA Public School District
    - San Francisco, CA Unified School District
    - Santa Clara, CA Unified School District
- Compared assumptions made by OSM executive leadership and operational staff prior to passage of the Bond regarding soft costs, project and program contingency, escalation, and program management costs to assumptions utilized by the following school districts during the development of similar bond measures:
    - Beaverton, OR School District
    - North Clackamas, OR School District
    - Salem-Kaiser, OR School District
    - Santa Clara, CA Unified School District
- Compared PPS' construction cost escalation against actual changes in construction costs. Actual construction cost were captured using the construction cost index for Portland produced quarterly by Rider Levett Bucknall.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Section 1: $790 Million Bond was Partially Supported by Independent Professional Estimates

In the public sector, where funding amounts are often set by voter-approved measures, owners must exercise prudence and diligence in estimating capital project costs and programming limited financial resources. Without this framework in place, a program is at risk of financial instability and loss of public trust to support similar initiatives in the future. For the $790 million 2017 Bond, we analyzed underlying cost estimates for each of the three major components as follows:

1. School Capital Projects—$580 million
2. Health and Safety Projects—$150 million
3. Program Management and Contingency—$60 million

Processes employed by OSM during the early stages of the 2017 Bond development phase were consistent with leading project cost estimation practices—as evidenced by both the use of a professional cost estimator to calculate project hard costs and external architects to develop school-specific master planning documents. However, when OSM began adding other required cost factors to the professional hard cost estimates to calculate total project costs, practices employed became less formal and eventually were no longer trackable to a replicable methodology.

Nonetheless, while no comprehensive documented methodology for estimating costs for the three Bond components was in place, the hard cost portion of the $580 million estimate for the school capital projects was supported by underlying independent professional estimates. [7] However, other cost factors were added to hard costs to arrive at total project costs as follows:

Total Project Cost = Hard Cost (from professional estimator)
+ Soft Cost (percent of hard cost)
+ FF&E (project specific)
+ Contingency (percent of all of the above)
+ Swing/Temporary Space (project specific)
+ Escalation (based on market condition and construction schedule)

Figures for these cost components, first proposed by OSM operational staff, aligned with market factors at that time. However, OSM executive leadership subsequently reduced the total capital school project cost estimates by $100 million without adequate justification or explanation of its rationale. [8] Further, the underlying assumptions used as part of the reduced project escalation and soft costs were inconsistent with market conditions at the time, industry leading practices, and similar bonds passed at other school districts.

[7] Capital project construction hard costs include estimates of expenses such as new construction or renovation, building and site-work, contractor bond and insurance, general conditions, geotechnical conditions, and other construction-related costs.

[8] Auditors attempted to locate documentation through reviews of internal budget worksheets and emails, 6,000 pages of documents discovered from a public records email request, key-word search results from employee personal computer drives and Google drives, and high-level searches of PPS internal shared drives.

Similarly, we found estimates for the $150 million of health and safety costs seem to be based on underlying independent professional estimates as well—although cost estimate reports to substantiate the specific details were not available for all health and safety categories. For the third and final component of the 2017 Bond related to program-level management and contingency estimates, no industry thresholds or best practices exist to validate the $60 million estimate; however, OSM executive leadership used assumptions and percentages that were low when compared to other districts reviewed and PPS' own historic performance.

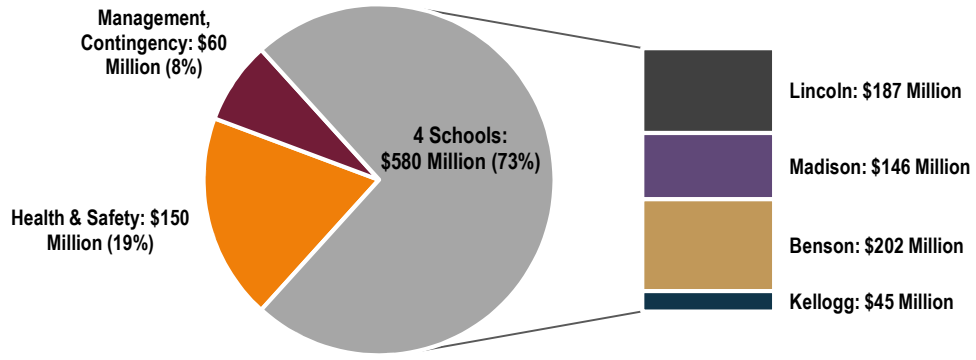
Although OSM operational staff and the program management consultant raised concerns with the cost factors used by OSM executive leadership during the development of the bond budget, we were unable to locate any documentation on how or whether those concerns were considered when OSM executive leadership presented bond options to the Board for approval in January 2017.

Nearly 70 Percent of School Capital Project Costs were Supported by Underlying Independent Professional Estimates

In contrast to best practices guidelines, a formal documented or consistent cost estimating methodology was not in place during the early bond budget development phase that included consideration of consistent cost components, data sources for underlying assumptions, roles and responsibilities of internal and external experts, processes to ensure consistency in cost considerations across schools or experts involved, due diligence vetting and approval practices, and retention of underlying documents. [9]

However, by early January 2017, initial costs for the school projects' master planning phase were finalized and presented to the Board with more than 73 percent of the $790 million earmarked for four school capital project improvements, as shown in Exhibit 6. Part of these costs were developed by PPS-hired architects and a professional cost estimator based on initial assessments of school buildings and site conditions, and were combined with OSM estimates for soft costs, FF&E, escalation and contingencies to arrive at total school project costs.

EXHIBIT 6. SCHOOL PROJECTS IN COMPARISON TO $790 MILLION BOND



Source: January 24, 2017 Board of Education Handout, 2017 Multnomah County Election Pamphlet, and Bond Program Budget Overview.

[9] The Construction Management Association of America (CMAA) emphasizes the importance of having a compatible and consistent cost estimate format to facilitate and communicate cost comparisons.

Total project costs were categorized into six primary components including hard costs, soft costs, FF&E, swing, escalation, and contingency. For the hard costs component, the professional cost estimator used preliminary architectural drawings prepared by each school's architect during the master planning phase to estimate costs. Aligning with industry practices, the basis of the estimates included a series of assumptions including, but not limited to, gross floor area, site-work, and margins and adjustments for items such as general conditions, overhead and profit, design contingency, or bonds and insurance.

Based on underlying documents, these independent professional cost estimates for project construction hard costs totaled approximately $403.5 million in January 2017 as shown in Exhibit 7—supporting nearly 70 percent of the $580 million in total school project costs or 51 percent of the total $790 million 2017 Bond.

EXHIBIT 7. PROFESSIONAL PROJECT CONSTRUCTION HARD COST ESTIMATES AS OF JANUARY 2017

Source: 2017 Bond Master Planning Final Concept Options reports prepared by PPS cost estimation consultant for the four schools shown.
Note: Costs were estimated by the PPS cost estimation consultant using rates current as of January 2017. Lincoln Hard Cost shown is for the horizontal option with site option B per the 2017 Bond Master Planning Cost Estimate prepared by PPS' Bond Cost Estimator.

For the remaining cost components related to areas such as soft costs, escalation, and contingency, OSM operational staff calculated estimates totaling $271 million using internal percentages and factors applied against project construction hard costs. This practice and the initial internal percentages used by OSM operational staff generally aligned with industry market conditions at that time.

OSM Executive Leadership Lowered School Capital Project Estimates by Approximately $100 Million, but No Explanation or Rationale Existed to Support Reduction

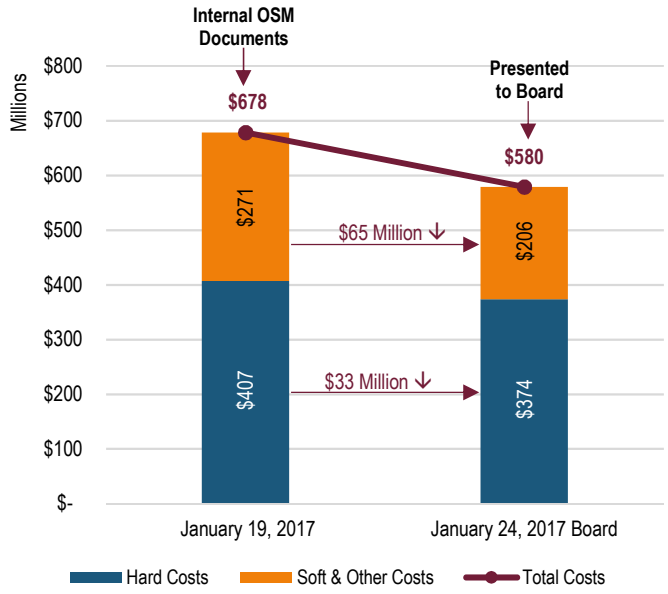
While it is not unusual for project owners like PPS to modify early independent professional cost estimates as they are most familiar with project-specific nuances, a documented explanation or rationale for adjustments to professional and OSM internal estimates would better ensure the integrity of estimates and enhance accountability.

As previously discussed, after OSM executive leadership received professional construction hard cost estimates for the four school projects in mid-January 2017 totaling $403.5 million, OSM operational staff ran various models adding amounts for soft costs, escalation, contingency, and FF&E to calculate total project estimates. One model from January 19, 2017 used cost assumptions that aligned with market conditions, historical performance, and leading practices that resulted in a $678 million total project cost estimate for the four schools as shown in Exhibit 8. [10] Subsequently, OSM executive leadership lowered the

[10] Public records requests data contained cost model versions 22, 23, and 24 that were generated between January 19, 2017 and January 23, 2017. Auditors used the January 19, 2017, version 22 as basis for comparison to data presented to the Board on January 24, 2017.

total school project cost amount by $100 million for a new total of $580 million—which was provided to the Board on January 24, 2017 and later approved by voters in May 2017.

EXHIBIT 8. SUMMARY COST ESTIMATE DEVELOPMENT FOR THE FOUR SCHOOL PROJECTS, JANUARY 2017

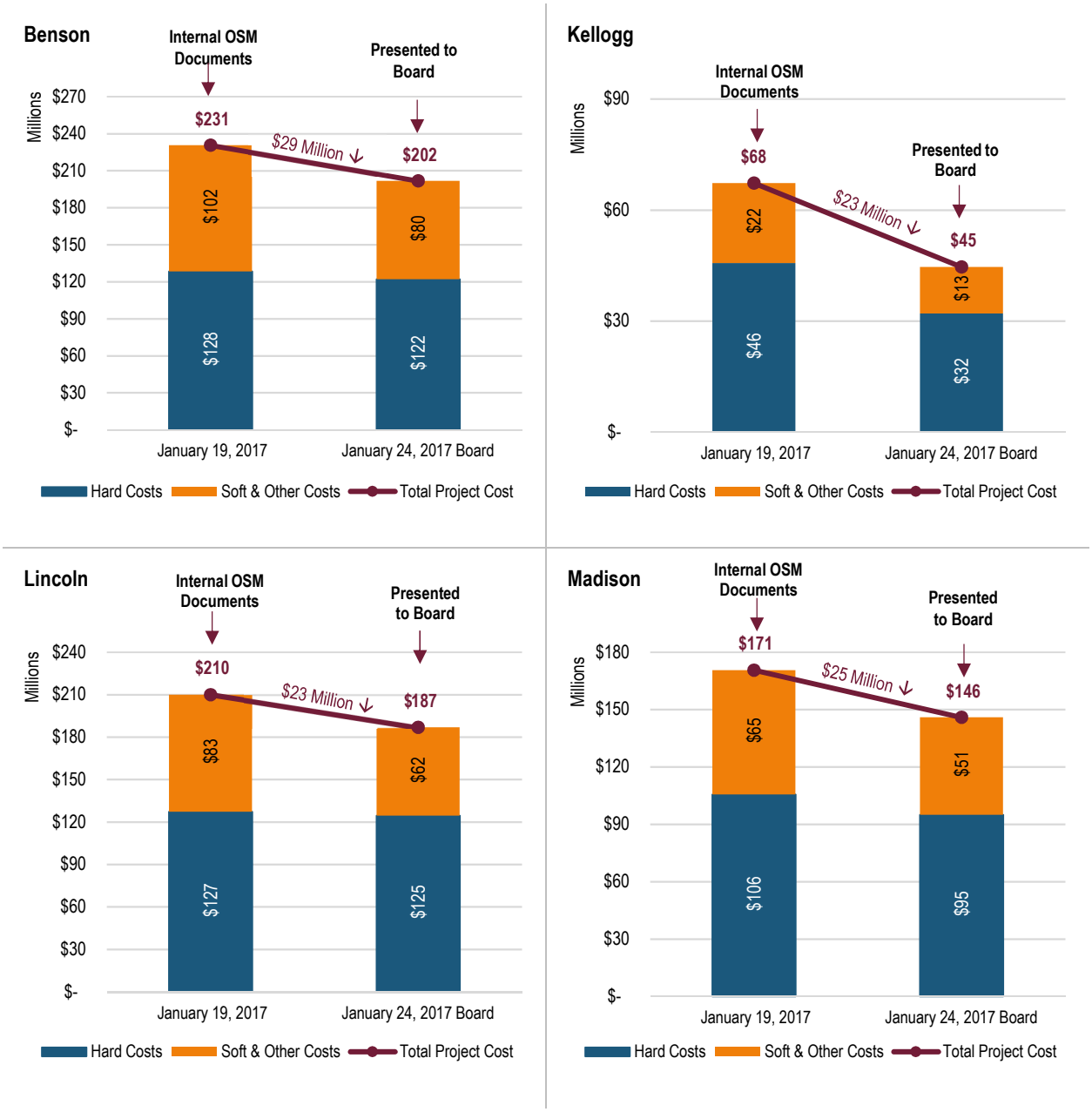


Source: 2017 Bond Master Planning Final Concept Options reports prepared by PPS cost estimation consultant. OSM Bond Budget Development Worksheets, Version 22, January 19, 2017. Board Working Session Meeting Packet, January 24, 2017. Estimates based on Option #1 approved by the Board in February 2017.

While it does not appear that project scope was also cut when cost projections were lowered based on our high-level review, it was difficult to determine with certainty since there were no underlying architect due diligence reports with validated costs supporting the $100 million reduction. As such, the underlying reason for the reduction in costs cannot be substantiated due to a lack of documentation or reliable supporting data. With an unsubstantiated approximate $100 million reduction—comprised of $33 million lowered from independent professional project construction hard cost estimates and $65 million lowered from internal project soft and other cost estimates—PPS was challenged from the beginning to deliver the projects within the approved budgets for the 2017 Bond.

At the individual school level, that $100 million reduction during the Bond budget development phase resulted in decreases in individual estimates ranging from approximately $23 million to $29 million lower than initial pre-bond budget estimates as shown in Exhibit 9.

EXHIBIT 9. PROJECT COST ESTIMATES BY INDIVIDUAL SCHOOL, JANUARY 2017



Source: 2017 Bond Master Planning Final Concept Options reports prepared by PPS cost estimation consultant for the four schools shown. OSM Bond Budget Development Worksheets, January 19, 2017. Board Working Session, January 24, 2017.

Note: Soft & other costs included soft costs, furniture, fixtures, and equipment, project contingency, and escalation. Lincoln Hard Cost shown is the Full Replacement Option per the Lincoln 2017 Bond Master Planning Final Concept Options report.

While adjustments to professional estimates may be warranted to account for factors such as expected volatility in the construction market, historical data from similar bonds, or professional judgment by OSM leadership and operational staff or other industry experts, best practices strongly recommend that those considerations be formalized and supported by an underlying methodology that documents the decision-

making process including any vetting of factors to and validity of assumptions used. [11] However, this framework did not appear to be in place when cost estimates for the 2017 Bond were developed. Rather, the audit found limited availability of documentary evidence surrounding key budget and cost estimation decisions, which further complicated any reconciliation of internal OSM budget working documents with information presented to the Board for approval.

When these cost reductions are combined with cost assumptions on the lower-end of the market spectrum as discussed in the next section, there is added strain and risk on the budget being sufficient to meet the 2017 Bond promises. This risk is further compounded if project designs or scopes are not similarly adjusted to reflect the budget reductions.

Other School Capital Project Cost Factors Were Low when Compared to the Market

While project construction hard costs typically comprise the majority of a project's total costs, there are five key cost components related to (1) escalation, (2) soft costs, (3) contingency, (4) FF&E, and (5) swing site contingency, if applicable. Our review found that some of the factors OSM executive leadership used in the cost estimates presented to the Board for approval of the 2017 Bond were not aligned with market conditions at that time.[12]

Escalation Assumptions were Inconsistent with Market Conditions at that Time and Historical Performance

When looking at historical rolling one-year escalation factor averages for the Portland region prior to the passage of the 2017 Bond, escalation was higher than OSM internal bond budget development worksheets. Specifically, while the one-year rolling average ranged between 4.4 percent and 6 percent between January 2015 and January 2017, OSM executive leadership used an escalation factor at the lower-end of the market at 4 percent.

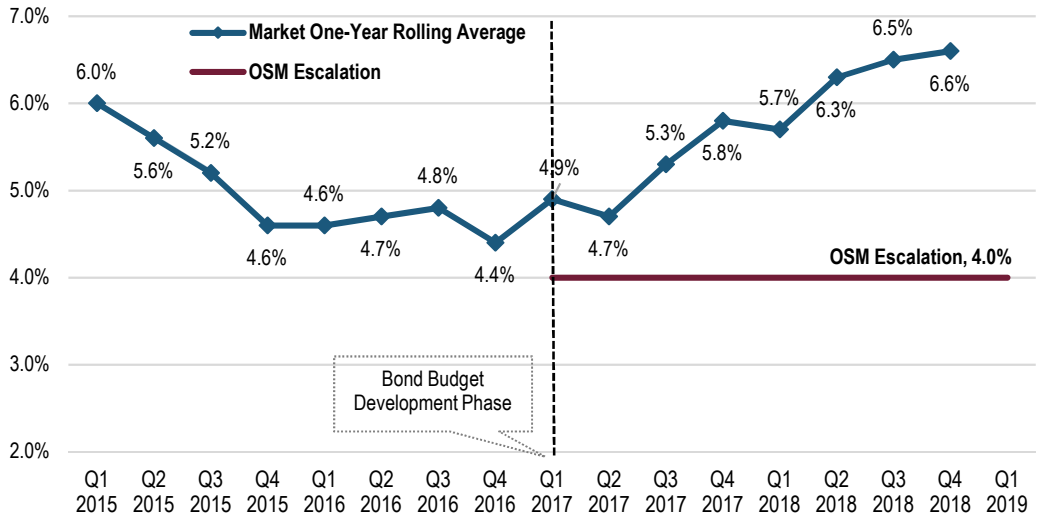
This nuance alone can possibly translate into a $21.2 million variance based on total project costs of $580 million.[13] In fact, actual escalation since the passage of the 2017 Bond has been higher than 4 percent, ranging from 4.7 percent to 6.6 percent as shown in Exhibit 10.

[11] The Construction Management Association of America (CMAA) Construction Management Standards of Practice, 2015.

[12] Market condition factors and data are captured nationally by geographic region and by select metropolitan areas, as well are widely-reported by industry experts and available for public owner use.

[13] The hypothetical $21.2 million represents the difference between annual escalation rates of 4 percent and 6 percent assuming a two-year construction period: $580 million minus $76.1 million escalation over 2 years at 4 percent and 6 percent. Difference is $21.2 Million.

EXHIBIT 10. ESCALATION MARKET CONDITIONS VS. OSM ASSUMPTIONS, JANUARY 2017



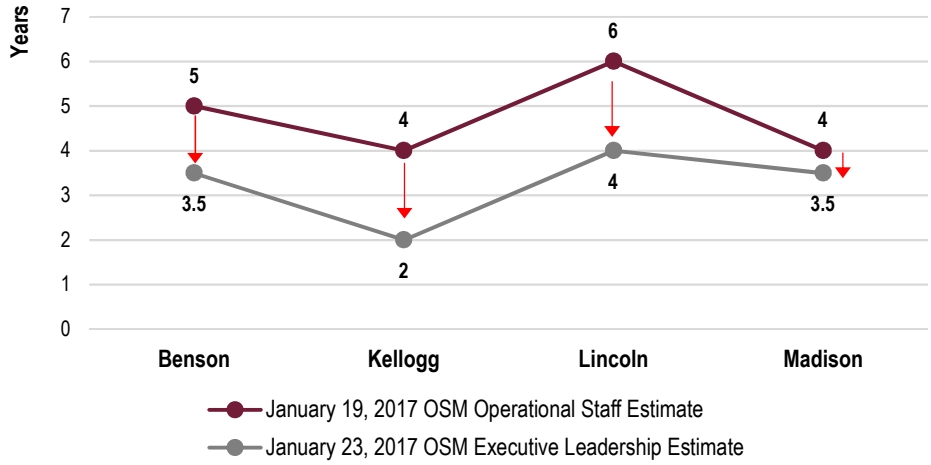
Source: Auditor-generated based on North America Quarterly Construction Cost Reports prepared by Rider Levett Bucknall, Quarter 1, 2015 to Quarter 4, 2018.

While the escalation factor used by OSM executive leadership was lower than actual construction cost increases at that time, other school districts used similar escalation factors in their bond programs that resulted in unfavorable budget issues. For instance, the Beaverton School District used a cost escalation factor of just 3 percent in its 2014 bond, while the North Clackamas School District assumed 4 percent when planning its 2016 bond package. Not only did both Beaverton and North Clackamas School Districts' escalation factors not align with the market, but actual construction cost increases remained well above these estimates. In fact, this resulted in a gap between actual and expected escalation in the Beaverton School District that is expected to grow to an 8.5 percent gap by 2021.

Moreover, another important escalation aspect for multi-year construction programs relates to the number of years for which escalation is calculated that should track with expected construction duration. For example, if construction is anticipated to take six years, then escalation should be extended over the same six-year period or the project could face an immediate and heightened risk of budget challenges.

For its initial internal 2017 Bond estimates, OSM operational staff correctly considered the four to six-year construction schedules based on underlying project scheduling documents as shown in Exhibit 11. However, the final estimate reduced that timeframe to two to four years. While reducing the number of years in calculating escalation also reduced total project cost estimates, this increased overall risks to the program in terms of cost overruns or gaps in funding by not aligning this calculation with reasonable construction schedules.

EXHIBIT 11. REDUCTION IN THE NUMBER OF YEARS FOR ESCALATION CALCULATION



Source: OSM Bond Budget Development Worksheets: January 19, 2017, January 23, 2017, 4pm; OSM Internal Project Execution Schedule, December 6, 2017.

In part, the cumulative effect of setting an escalation factor lower than market and shortening the number of years for escalation calculation purposes contributed towards the forecast issues experienced shortly after the 2017 Bond passed.

Soft Cost Assumptions did Not Align with Historic Performance

OSM executive leadership set additional project-level soft cost assumptions that were also lower than industry values and further exacerbated the budget challenges PPS faced after voters approved the 2017 Bond. For instance, OSM operational staff initially estimated soft costs at 15 percent of the construction hard costs for each of the four schools. However, as shown in Exhibit 12, those soft costs were reduced to 13 percent by OSM executive leadership without explanation when sent to the Board for approval—a factor that was significantly lower than comparables or historical PPS data from the 2012 Bond and internal 2014 High School Estimation Methodology considerations where soft costs were set at around 20 percent. [14]

Likewise, the North Clackamas School District with a similar capital construction bond combined soft cost estimates with FF&E estimates to arrive at a combined rate of 35 percent for these hard costs. [15] Although the North Clackamas School District's 35 percent figure included both soft costs and FF&E as one factor, it was still higher than the factor used by PPS if we combined soft costs with FF&E. Specifically, PPS' combined rate averaged 20.5 percent and ranged from 17 percent to 28 percent for individual schools as shown in Exhibit 12.

[14] Memo from former OSM Executive Director detailing High School Estimation Methodology, January 16, 2014.

[15] The $433 million North Clackamas School District's Capital Construction Bond passed in November 2016. The budget was revised to $466 million in May 2017.

EXHIBIT 12. COMBINED SOFT COST AND FF&E COST FACTORS USED BY PPS, JANUARY 2017

	Soft Cost		FF&E		Combined Rate
	Initial	Final	Initial	Final	Final
Benson	15%	13%	14%	15%	28%
Kellogg	15%	13%	4%	6%	19%
Lincoln	15%	13%	4%	4%	17%
Madison	15%	13%	5%	5%	18%

Source: OSM Bond Budget Development Worksheets: January 19, 2017 and January 23, 2017, 4pm.

Contingency Assumptions were more Aligned with Past Performance

By contrast, OSM operational staff estimates for school project contingency were more in line with industry at 10 percent for rebuilding Kellogg Middle School and Lincoln High School and 15 percent for the renovations at Benson High School and Madison High School. [16] In fact, these percentages were comparable to the 2012 PPS Bond that used a 15 percent contingency for modernizations as well as aligned with the Beaverton School District that considered a 10 to 15 percent contingency for new construction and up to 20 percent for renovations on its school improvement projects. [17, 18]

Project-Level Cost Concerns were Raised, but we Could Not Determine if they were Considered by OSM Executive Leadership

During cost development efforts in the days before bond estimates were presented to the Board on January 24, 2017, OSM operational staff and external consultants raised concerns about factors considered and numbers used—although, we could not find any documentation to determine whether those concerns were considered or how final decisions were made. In fact, OSM operational staff stressed the need for a documented estimation methodology similar to what had been produced for the 2012 Bond that should be understandable and replicable. Additional concerns raised are summarized in Exhibit 13 and mostly related to cost factors used being too low.

EXHIBIT 13. KEY CONCERNS RAISED BY OSM OPERATIONAL STAFF AND CONSULTANTS

	PPS Assumptions	Concerns Raised
Soft Cost	10% - 13%	⚠ 13% is on the lower-end of the acceptable range of 13-15%
FF&E (1)	4% - 15% or $16 - $47 per sf	⚠ $16 per square foot is on the lower-end of the acceptable range of $16-$20 per square foot
Contingency	10% - 15%	⚠ Low project contingency

[16] The Construction Management Association of America (CMAA) suggests adding a contingency of 15 to 25 percent to the total of estimated construction costs.

[17] The $680 million Beaverton School District's Capital Construction Bond passed in May 2014.

[18] PPS 2012 Bond contingency factors were similar to internal 2014 High School Estimation Methodology using a 15 percent contingency factor.

	PPS Assumptions	Concerns Raised
		⚠ Guaranteed Maximum Price (GMP) contingency excluded from total project cost estimate (2)
Swing	Only considered for Lincoln	⚠ Swing excluded from hard cost estimate ⚠ Swing is underestimated
Escalation	4% annually	⚠ Should be between 4-5% ⚠ 4% is low-end of range ⚠ Should be realistic and tie-in with project schedule

Source: OSM operational staff and external consultants emails, January 2017.
Note: (1) FF&E was $16/square foot for Kellogg middle school, Lincoln high school, and Madison high school. For Benson, FF&E was $45 per square foot on January 19, 2017 and $47 per square foot on January 23, 2017. (2) The Construction Management Association of America defines GMP as "a contractual form of agreement wherein a maximum price is established based upon an agreed scope of work stablished with an understanding by the parties that the actual cost of work could be more or less."

Additional school-specific cost concerns raised by external school project architects included, but were not limited to, the exclusion of fireproofing steel or insulation of exterior walls from the hard cost estimate. Anecdotally these and other concerns such as missing a third-party reconciliation of the hard cost estimates were echoed by the school project architects. Yet, there was no documentation to determine whether these concerns were considered as part of the 2017 Bond estimates. Contrary to industry and good business practice, these concerns and resulting impacts were not sufficiently documented to demonstrate diligence in the 2017 Bond decision-making process or promote greater accountability and transparency to the public.

Health and Safety Project Costs Appeared to be Based on Independent Estimates and Needs Assessments, although Full Documentation did not Exist to Substantiate

As part of the 2017 Bond, PPS set-aside $150 million for health and safety projects in eight specialty areas at schools throughout the district. These eight areas related to water quality, fire safety, asbestos, lead-based paint, roofs, Americans with Disabilities Act (ADA), radon, and security systems.

Cost estimates to fully mitigate issues in these areas were calculated using different methodologies depending on the unique health and safety area and were based on information sources including professional cost estimators and technical consultant estimates; prior assessments for seismic, ADA, and roofing needs conducted in 2009; and FAM's internal facility database as shown in Exhibit 14. [19] This included a 2008 comprehensive assessment by an external consultant that established a baseline report of facility conditions noting deficiencies by system (such as electrical, fire protection, and roofing) as well as deficiencies by cost category (such as hazardous material, ADA compliance, or deferred maintenance). Further, PPS indicated that the professional cost estimator updated prior assessment costs, calculated contingencies, and estimated inflation. Although the health and safety projects are much smaller in scale than the comprehensive school modernizations projects, adding contingency and escalation factors to total project costs aligns with best practices.

[19] Based on a January 24, 2017 Board Bond Work Session Handout.

While we were not able to locate or substantiate all of the underlying documentation, there did seem to be a conscientious methodology employed to estimate costs with supporting empirical data based on independent consultant estimates and formal needs assessments in existence at the time. Specifically more than $45 million—or 30 percent—of amounts presented to the Board on January 24, 2017 for water quality and lead-based paint projects were fully supported by underlying consultant reports prepared in 2016. In addition, for the roof projects, some assessments prepared by the roofing consultant in 2008 were available, but updated 2016 cost estimates could not be located. Similarly for ADA, while the 2013 ADA assessment was available, the 2016 ACC cost estimate was not. For the remaining categories, records could not be located to support any of those estimates.

EXHIBIT 14. SOURCES FOR COST ESTIMATES ASSOCIATED WITH THE $150 MILLION IN HEALTH & SAFETY PROJECTS

Project Area	Estimate	Cost Data Source (1)
Water Quality	$28,492,000	CH2M December 2016 Report and Cost Estimate
Fire Safety	$25,849,990	ACC December 2016 Cost Estimate based on 2016 FAM Inventory of Existing Conditions
Asbestos	$12,000,000	ACC December 2016 Cost Estimate based on 2016 Risk Management Database
Lead-based Paint	$16,623,936	PBS Environmental Report and December 2016 Cost Estimate
Roofs	$50,907,949	ACC November 2016 Cost Estimate based on FAM Inventory of Existing Conditions and 2008 Professional Roof Consultants, Inc. Assessments
ADA	$10,000,000	ACC November 2016 Cost Estimate based on 2013 Akrom Moisan Architects' ADA assessment
Radon	$1,126,125	ACC November 2016 Cost Estimate based on 2016 PPS Risk Management Database
Security Systems	$5,000,000	Triad Consulting December 2016 Cost Estimate and ACC November 2016 Cost Estimate
Total	**$150,000,000**	

Source: January 24, 2017 Board of Education Informational Report on Environmental Health and Safety Facility Improvements.

Acronyms: ACC = Architectural Cost Consultants (an external firm); FAM = Facilities and Asset Management; PBS = PBS Engineering and Environmental (an external firm).

Note (1): In addition to independent professional estimates for project hard costs, PPS added the following factors: 15 percent for soft costs, 10 percent for contingency, 15 percent for a construction contingency, 5 percent for escalation, and 5 percent for abatement on fire, roof, ADA, and security projects.

Although other school districts in Oregon, Washington, and California had similar bond measures with mention of health and safety projects planned, we did not find publicly available data to allow a comparison to FAM's health and safety project cost estimates. [20] Moreover, none of the bond measures for the other districts we reviewed had a separate standalone health and safety project component like PPS' 2017 Bond.

[20] Other districts reviewed were Beaverton, Clackamas, Eugene, Salem-Kaiser, Hillsboro, Gresham, and Battleground School Districts in Oregon as well as Vancouver and Seattle School Districts in Washington and San Francisco School District in California.

Program-Level Cost Estimates Were too Low and did not Align with Other Districts Reviewed

As with any major capital construction program, there are costs that cannot be attributed to a specific project and typically relate to the overall delivery of the program. Two key components of those overarching, program-wide costs are (1) program contingency and (2) program management.

Similar to contingency at a project-level, the intent behind a program contingency is to set aside or reserve amounts for unforeseen events and financially mitigate risks associated with the delivery of large-scale capital programs. Since the level of risk varies based on unique complexities of individual capital projects as well as an owner's risk tolerance, there are no set established industry thresholds for setting these program contingency amounts. Furthermore, program management generally represents labor costs of owner staff and fees for any owner representatives hired to assist with the management and delivery of the program, as well as technology costs or office space. Depending on the unique mix of in-house and consultant staff and related staffing levels, program management costs can also vary and, thus, there are no firmly-established industry thresholds for estimating program management amounts. However, both the program contingency amounts and the program management amounts are typically applied as a percentage of total capital project costs.

For the 2017 Bond, we could not find any documented methodology used to estimate program costs and percentages established may be too low when compared to other district bonds we reviewed as well as historic experiences of PPS' 2012 Bond. As a result of assuming program cost percentages on the lower end, OSM executive leadership at that time may have increased risks and challenges of delivering the Bond projects on-budget and/or as promised to the voters.

Methodology Used to Estimate Program Costs was not Documented

While we analyzed several internal budget working documents, there was no formal or comprehensive budget development methodology employed or documented supporting program cost estimates. For instance, OSM executive leadership identified $60 million for program management and program contingency. However, there was no information explaining how that number was derived nor any historical cost analysis performed to help support assumptions.

Because program management costs are primarily labor dependent, a sound practice in estimating management costs entails evaluating a program's staffing needs over the life of the program. At the Beaverton School District, staff derived program management cost estimates for its bond measure in part from salary costs of district employees working on the program as well as planned staff augmentation over the life of the program. A similar methodology was employed by OSM operational staff for its 2012 Bond where its program management cost estimate was based on a thorough analysis of the number of program staff, related payroll costs, and expected program management consultant services. Yet, a similar staffing assessment or more comprehensive analysis was not done for the 2017 Bond.

Assumption Percentages Applied were Lower than Other Districts Reviewed

The $60 million for program contingency and program management represented approximately 8 percent of program costs, although OSM operational staff and external consultants expressed concerns on the low

figure prior to the bond passage. Specifically, one concern expressed that the program contingency portion was too low at $20 million and not sufficient to cover site specific conditions at Lincoln, Madison, and Benson High Schools. Another concern raised was that at least 6 percent was needed for program management alone and the $40 million estimate for program management did not appropriately include escalation. However, there was no documentation available demonstrating whether those concerns were considered for the options presented to the Board for approval in January 2017.

When compared to other districts in Oregon and California, OSM executive leadership's 8 percent assumption was lower than the other bond programs. For instance, both Beaverton and North Clackamas School Districts in Oregon used factors of 14 and 13 percent, respectively, of total project costs. [21] In dollars, Beaverton School District's program contingency and management was $65 million for its $680 million bond compared to PPS's lower $60 million amount for its larger $790 million bond. Additionally, the Santa Clara Office of Education in California also used a higher factor for its $720 million school construction bond program at 13 percent. [22] Even when considering PPS's own historical experience with its 2012 Bond, staff used a 10 percent factor for program-related costs in 2012—further reinforcing concerns with the reasonableness of the lower percentage used for the 2017 Bond.

[21] Beaverton School District had a $680 million bond passed in 2014. North Clackamas School District had a $433 million bond passed in 2016.

[22] Santa Clara Office of Education had a $720 million bond that passed in November 2018.

Section 2: Additional Cost Information could have Aided Decision Making and Transparency

After compiling and estimating various 2017 Bond project cost scenarios, OSM executive leadership first presented four bond options to the Board on January 24, 2017. At this meeting attended by OSM executive leadership, OSM operational staff, and architects, only high-level cost information was provided in addition to design data and project details. While the level of cost detail was similar to that provided by other districts we reviewed, more comprehensive underlying information could have aided with buy-in and decision-making as well as enhanced transparency of the Bond activities.

Limited Cost Data Was Provided to the Board

First introduced in January 2017, PPS and OSM executive leadership provided the Board with four options for the 2017 Bond for modernization and rebuild projects, health and safety projects, and program-wide efforts as shown in Exhibit 15.

EXHIBIT 15. BOND OPTIONS PRESENTED TO BOARD, JANUARY 24, 2017

Option 1: $790 Million
$324M FOR HEALTH & SAFETY

- Additional health & safety projects $150M
- Modernization & additions
  - Benson $202M
  - Madison $146M
- Full rebuild
  - Lincoln $187M
  - Kellogg $45M
- Management, Contingency & Miscellaneous $60M

Option 2: $867 Million
$347.1M FOR HEALTH & SAFETY

- Additional health & safety projects $150M
- Modernization & additions
  - Benson $202M
  - Madison $146M
  - Lincoln $252M
  - Kellogg $57M
- Management, Contingency & Miscellaneous $60M

Option 3: $745 Million
$310.5M FOR HEALTH & SAFETY

- Additional health & safety projects $150M
- Modernization & additions
  - Benson $202M
  - Madison $146M
- Full rebuild
  - Lincoln $187M
- Management, Contingency & Miscellaneous $60M

Option 4: $810 Million
$330M FOR HEALTH & SAFETY

- Additional health & safety projects $150M
- Modernization & additions
  - Benson $202M
  - Madison $146M
  - Lincoln $252M
- Management, Contingency & Miscellaneous $60M

Source: Board Working Session, January 24, 2017.

For the school modernization and rebuild projects, OSM executive leadership provided documents including project overviews, Master Planning Committee guiding principles, pre-design due diligence reports, health and safety considerations, existing design graphics, and design options. Moreover, OSM executive leadership provided a single-figure estimate for construction and a separate figure for total project costs in addition to narrative and statistics surrounding student capacity, design, and proposed building area in square footage. However, there was no data presented on cost methodology or underlying

cost assumptions. Without information summarizing estimation methodologies used or rationale behind cost assumptions, it is challenging to understand the nuances between the various options proposed or the implications of ultimate decisions.

No Rationale was Found Supporting Various Health and Safety Project Options

For the health and safety projects, PPS executive leadership provided data including a synopsis of the age of PPS school facilities, assessment of facility conditions, cost analysis, possible prioritization methods, and three options for remediating the health and safety needs. Handouts available to the Board listed specific professional cost estimates and technical assessment source documents.

Specifically, PPS executive leadership presented three separate options for the pool of health and safety projects ranging between $100 million, $150 million, and $200 million set aside to address nine types of possible health and safety needs as shown in Exhibit 16. The primary differences between the three cost options were the number of schools that could be funded within a specific category and whether funds for security system projects and seismic projects were included in the three options. However, we could not find a rationale or documentation supporting the various funding options at the $100 million, $150 million, or $200 million levels.

EXHIBIT 16. HEALTH & SAFETY ESTIMATES AVAILABLE TO BOARD, JANUARY 24, 2017

Staff recommendations for additional health & safety projects at 3 cost levels

	$100 MILLION		$150 MILLION		$200 MILLION	
	Dollar amount	Schools funded	Dollar amount	Schools funded	Dollar amount	Schools funded
	$28,492,000	Up to 90	$28,492,000	Up to 90	$28,492,000	Up to 90
	$19,757,939	Up to 13	$25,849,990	Up to 16	$31,757,939	Up to 20
	$9,000,000	Up to 37	$12,000,000	Up to 48	$14,000,000	Up to 58
	$16,623,936	Up to 88	$16,623,936	Up to 88	$16,623,936	Up to 88
	$20,000,000	Up to 5	$50,907,949	Up to 14	$80,000,000	Up to 23
	$5,000,000	Up to 4	$10,000,000	Up to 9	$15,000,000	Up to 13
Rn	$1,126,125	Up to 90	$1,126,125	Up to 90	$1,126,125	Up to 90
	…	…	$5,000,000	Up to 11	$8,000,000	Up to 13
	…	…	…	…	$5,000,000	Up to 2
	…	…	…	…	…	…
	…	…	…	…	…	…

Source: January 24, 2017 Board Bond Work Session Health, Safety, and Modernization Bond handout.

Board Questions Focused More on Design than Cost

After the presentations to the Board, members asked a variety of questions, both general and specific to individual school modernization projects. Most of the questions were related to either the design process, programs to be offered on campus, or other education-related services—but only a few questioning costs. Even for the health and safety projects, questions primarily centered on ADA requirements and whether

project budgets for each of the health and safety categories were distributed equitably around the district. In terms of vetting the cost estimates presented, there were two primary questions—one related to the difference between construction costs and project costs and another related to how costs were allocated to FF&E. Additional Board interaction regarding the costs associated with the four different Bond options involved members stating preferences for the rebuild options as well as the inclusion of the Kellogg Middle School and a brief discussion on bond levy rates.

Also, at two Board meetings in January and February 2017, an external bond marketing consultant presented results from a survey of Multnomah County voters to determine the likelihood of passing a PPS Bond measure on the May 2017 ballot. Results indicated that the majority of voters would support both a $750 million proposed bond as well as an $850 million bond, but the latter could be a tougher sell. Questions asked by the Board included asking for details of voter willingness to approve a bond amount within the proposed $750 to $850 million range, whether alternatives between school rebuild or school modernization had an effect on voter preference, and what level of understanding voters had on how health and safety projects would be addressed within the school modernization projects.

Information Provided was Similar to Most Other Districts Reviewed

While presentations made to the PPS Board did not describe the development of cost estimates, the material presented to the Board was not unlike the approaches used by other school districts we reviewed when they were developing similar capital construction bond programs.

For example, for the North Clackamas School District's $433 million capital construction bond, staff presented three options to its board with cost assumptions and estimations only briefly discussed when the options were presented. Subsequent board meetings in that district focused on the projects included in each of the various bond options, public outreach efforts and levels of support for each option, and administrative efforts necessary to get the bond measure on the ballot—yet, like PPS's bond interactions, these presentations had limited focus on cost. Rather, the information presented was more focused on the higher-level design details of the bond packages as well as the feedback from public engagement efforts.

Similar information was also provided to the Board of Trustees for the Santa Clara Unified School District in California prior to its passage of a $720 million school construction bond in 2018. Beginning in late 2017, staff presented the board with six bond scenarios; like PPS, the presentations did not appear to include a discussion of cost assumptions or methodology. Subsequent board discussions focused on the projects included in each of the various bond options, district debt capacity and effects on property taxes, and timing of placing the bond measure on the ballot. [23]

While it appears that information provided to the PPS Board was consistent with most other districts we reviewed, we believe additional data could be provided in the future such as comparisons of cost estimates with the current market and/or industry standards as well as performance at other districts, where applicable, to better communicate fiscal conditions, potential challenges, and impacts of decisions.

[23] Results based on publicly available documents such as pre-bond communications, board materials, financial reports, and bond status reports.

Section 3: Although Project Estimates Have Increased, PPS Has Been Working on Cost Containment

Estimates to complete the projects for the $790 million 2017 Bond have grown by more than 26 percent to $997 million based on December 2018 forecasts. For the capital school projects alone, estimated costs have increased from $580 million at bond passage to $797 million. With such a significant increase in less than two years since the 2017 Bond passed, delivering all projects proposed to voters within the $790 million budget has been challenging.

However, there has been significant activity at Lincoln, Madison, and Benson High Schools as well as Kellogg Middle School with OSM operational staff evaluating master plans, refining designs, performing revised cost estimates and preparing for construction. Specifically, immediately after the 2017 Bond passed, OSM commissioned updates to master planning documents for all four schools with the intent to refine design concepts and better align cost estimates with current market conditions. According to current OSM executive leadership, practices have changed since the 2017 Bond budgets were developed in late 2016 and early 2017 and emphasis has been placed on formalizing cost estimation methodologies and developing realistic budgets. [24]

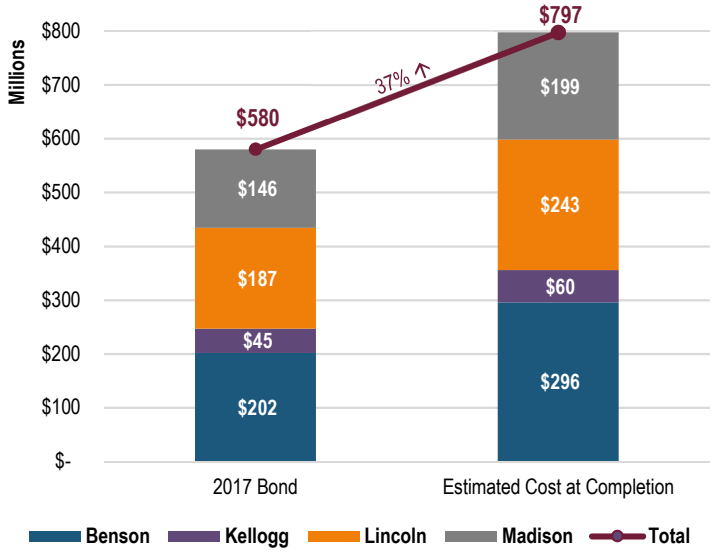
In addition, while fluctuations in cost estimates are typical as projects advance through various stages of planning and design, OSM has initiated cost containment efforts that include revisiting design decisions through focused value engineering sessions and obtaining updated independent cost estimates. Nonetheless, bridging the budget gap may also require eliminating scopes or defer projects to future bond measures. In fact, the Benson High School project is now expected to be completed with the next bond.

Estimated Costs to Complete School Projects Have Increased Nearly 37 Percent Since the Bond Passed

As projects advance through the various stages of their lifecycle and designs become more refined, estimates of project costs are updated to reflect current scopes and budgets. For the four schools, total capital project budgets were updated as part of typical project milestones such as master planning, schematic design, design development, and construction documents. Based on data as of December 2018 from OSM's e-Builder system, the school modernizations are now expected to cost $797 million when completed—37 percent, or $217 million more than the $580 million estimated for the 2017 Bond as shown in Exhibit 17.

[24] Assertions will be corroborated in future audits.

EXHIBIT 17. 2017 BOND BUDGET VS. ESTIMATED COST AT COMPLETION, AS OF DECEMBER 31, 2018



Source: Board Working Session Meeting Packet, January 24, 2017. Program Management Cost Report from OSM e-Builder system, with data as of December 31, 2018.

Because project pricing is closely tied to market conditions, market volatility and assumptions used to predict that volatility—such as escalation—can have a significant impact on cost estimates. As discussed in Section 1 of this report, former OSM executive leadership used escalation factors that were lower than market when developing the 2017 Bond budget, which could be a contributing factor for the variances between January 2017 and December 2018 estimated costs. Specifically, the revised estimates reflected escalation and contingency cost factors that were more considerate of market conditions. However, many additional factors such as scope additions, design modifications, schedule changes, shortage of skilled labor, availability and pricing of materials, or updates to education specifications (Ed Specs) could also affect increases in cost estimates.

Comprehensively identifying and reconciling reasons for the estimated cost increase is a significant effort that the audit could not undertake for this report. Such an endeavor would involve comparing assumptions used across various milestones and projects, reconciling line item amounts to subcontractor bids, reviewing detailed design specifications, and assessing the impact of unique design changes and other cost savings efforts on cost estimates that requires a level of site-specific knowledge and project familiarity that is beyond the scope of this phase of the audit. Yet, as warranted and practical, additional work and analyses may be conducted in this area as part of subsequent audits.

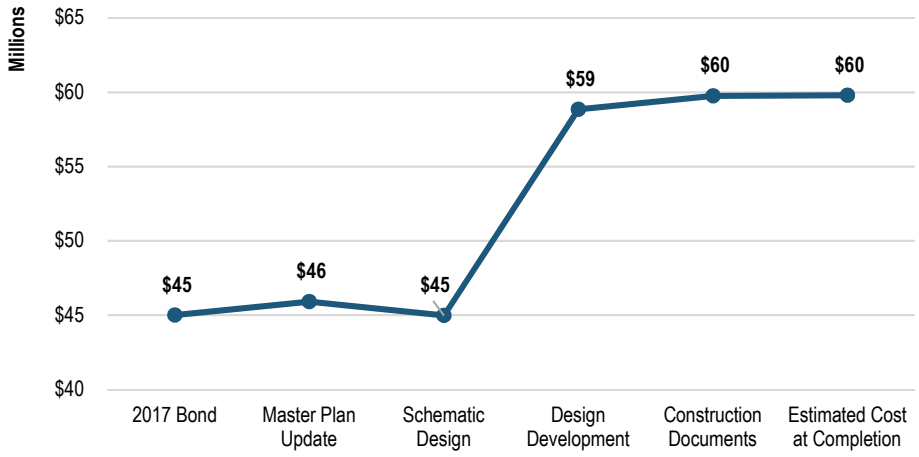
Fluctuations in Cost Estimates are Typical During Early Planning and Design

Despite the various important discussions surrounding budget increases, cost estimates, and cost containment, it is not unusual for capital project cost estimates to increase or decrease as projects progress through the various project delivery stages as scopes and quantities become more refined and are adjusted to align with changing needs or available funding. Even when a project enters the construction phase, costs

could increase again due to higher construction bids or unforeseen conditions faced during actual construction—ultimately impacting the total project cost at completion.

For instance, the Kellogg Middle School capital project, which will be the first of the four schools to start construction in the fall of 2019, was estimated to cost $45 million when the Bond passed in 2017, but latest OSM estimates identified the total cost to complete Kellogg at $60 million as shown in Exhibit 18.

EXHIBIT 18. KELLOGG MIDDLE SCHOOL EXAMPLE SHOWING TOTAL PROJECT COST ESTIMATES AT SELECT MILESTONES



Source: Kellogg updated Master Plan completed November 20, 2017; 90% Schematic Design completed April 12, 2018; Design Development completed July 16, 2018; 50% Construction Documents completed December 17, 2018; Estimated Cost at Completion per e-Builder as of December 31, 2018.

While Recent Cost Estimates were Higher than 2017 Bond, OSM is Working on Cost Containment

With estimated costs to deliver the projects rising since the Bond passed in May 2017, OSM operational staff have been continually challenged to identify cost saving measures while still delivering the projects in accordance with PPS Ed Specs approved by the Board and the needs of the community. Since all of the projects were still in the early planning phase when the 2017 Bond passed, there has been opportunity for OSM to explore cost containment options through various value engineering efforts— a standard industry-wide technique used to identify alternatives to control costs prior to completion of design and before the start of construction. [25]

For instance, when the 90% Schematic Design for the Kellogg Middle School project identified a $13 million difference between the design and construction budget, an external architect worked with OSM operational staff to explore options to bridge the gap. [26] Ideas generated included substituting grass for a synthetic turf system to reduce costs by $412,000 and reconfiguring the school as a 3-story building instead of a 4-story structure by reducing certain programs for a savings of approximately $1.5 million. These and other similar

[25] The CMAA states that value engineering is used for the purpose of optimizing value in project designs. It is best completed during the initial preliminary design stage.

[26] Kellogg 90% Schematic Design Document, April 2018.

considerations for the Kellogg Middle School designs eventually narrowed the gap between the budget and cost estimate from $13 million to $824,000.

Also in-line with leading practices, OSM held a value engineering workshop in December 2018 for the Lincoln High School project that identified $29.5 million in cost saving opportunities. Building upon the success of the Lincoln High School value engineering workshop, OSM intends to go forward with value engineering efforts with the next one scheduled in May 2019 for the Benson High School project.

In addition, as of December 31, 2018, only $50.8 million of the $790 million Bond has been spent or committed for the four schools as shown in Exhibit 19. With that in mind, there is still time for PPS oversight bodies, OSM, and stakeholders to collaboratively work together towards delivering modern facilities that address the needs of the District's educational goals within the budgetary constraints set by the 2017 Bond—or determine that some 2017 Bond projects may have to be delayed and delivered as part of subsequent bond cycles or reduced scopes may have to be considered. In fact, the completion of the Benson High School project has already been deferred to the next bond due to the projected funding shortfall.

EXHIBIT 19. BUDGET TO ACTUALS AND ESTIMATED COST AT COMPLETION, AS OF DECEMBER 31, 2018

	Status as of December 2018	Actual Expenses through December 2018	Commitments (Encumbrances) as of December 2018
Kellogg	50% Construction Documents	$ 4,316,952	$ 6,262,444
Madison	100% Design Development	$ 6,625,849	$ 14,234,869
Benson	Master Planning	$ 519,380	$ 3,585,596
Lincoln	75% Schematic Design	$ 2,368,891	$ 12,845,908
Total		**$13,831,072**	**$36,928,817**
		$50,759,889	

Source: OSM e-Builder 'Cost Summary - Budget vs. Commit vs. Actuals Paid' Report; OSM e-Builder "Project Management Cost Report – by program".

Section 4: Conclusions and Recommendations

During the audit, we primarily focused on PPS and OSM activities in late 2016 and early 2017 leading up to the Bond passage. Given that the scope of this audit was limited to assessing the development of cost estimates for the $790 million Bond, conclusions drawn and areas suggested for PPS and OSM consideration were based on currently available data and practices in place for that time period. While we found that initial cost estimates used to develop the 2017 Bond were generally supported by professional estimates and followed a consistent process, final cost estimate figures presented to the Board for bond approval were lower than market conditions at that time and could not be replicated due to lack of a formal, documented methodology.

However, current OSM executive leadership has asserted that many protocols have changed since that time and practices recommended from this audit are now in place. These subsequent changes and revised practices will be verified as part of the next audit phase or future annual Bond performance audits.

Recommendations

While OSM operational staff stressed the importance of a bond cost estimation methodology that is understandable and traceable to underlying assumptions and records, the cost data presented to the PPS Board for approval of the 2017 Bond lacked data to allow for a replication of the figures used by OSM executive leadership. To better align cost estimates with prevailing market conditions and industry leading practices, OSM should have developed a formal cost estimation methodology for use on all projects, documented deviations from standard practice, and established a central location to retain all final cost estimates including any supporting documentation used to develop each estimate. However, current OSM executive leadership stated that it now ensures its project estimates use factors that align with market conditions and better documents results of cost decisions. Since we have not yet had an opportunity to verify current practices, we recommend that, on a go-forward basis, OSM should begin or continue to:

1. Develop and consistently apply a formal cost estimation methodology across projects regardless if developed in-house or by external consultants, including documentation of the reasons for any deviations from the established methodology.
2. Compare and analyze cost estimate assumptions and factors with historic practices and other comparable bonds or districts to determine whether adjustments to estimation methodology seem warranted.
3. Establish a central location to retain final estimates at each project phase (master planning, schematic design, design document, construction document), including any supporting documentation used to develop each estimate.

In addition, more comprehensive data could have been provided to the Board when discussing cost estimates such as comparisons of estimates with market and/or industry standards as well as performance at other districts, where applicable, to better communicate fiscal conditions, potential challenges, and impacts of decisions. Thus, to enhance transparency and Board knowledge, OSM should:

4. Discuss comparison of cost estimation methodology used with past PPS experiences, current market conditions, and estimates developed by peer districts when presenting cost estimates to the Board and public stakeholders.
5. Categorize the reasons for variances in project costs, and aggregate those changes to the program-level to provide information on why costs varied from original bond, as well as report this information to the Board and public stakeholders.

Finally, in light of the increased scrutiny PPS is experiencing with its cost estimates, OSM should identify key cost drivers and closely monitor trends that could impact funding available for PPS bond projects. Trends with increased program financial risk should be captured, analyzed, and presented to the Board and general public along with scenarios to mitigate risks or options to minimize negative impacts resulting from cost estimates coming in higher than expected. Following are some recommended actions for considerations to assist OSM in responding to changing construction market conditions and strengthen transparency and accountability. Specifically, OSM should:

6. Conduct an analysis to determine to what degree various factors, especially scope changes and changes in construction costs, caused an increase in construction costs for the 2017 Bond projects. This could include comparing assumptions used across various project milestone reports and/or reconciling line items amounts to subcontractor bids.
7. Analyze results of variances to make adjustments to future estimation models and methodology as well as to analyze whether changes are needed in the delivery of projects to ensure stronger cost containment.
8. Ensure project milestone reports use consistent data across all projects and clearly identify deviations.

Appendix A: Auditee Response

PORTLAND PUBLIC SCHOOLS
501 North Dixon Street / Portland, OR 97227
Telephone: (503) 916-2222/ Fax: (503) 916-3253
Mailing Address: P. O. Box 3107 / 97208-3107

Date: **April 4, 2019**

To: Cathy Brady, Principal
Sjoberg, Evashenk & Associate

From: Dan Jung, Chief Operating Officer

Subject: Performance Audit – Fiscal year 2018/2019
Phase I Report
Staff Response

Portland Public Schools (PPS) and the Office of School Modernization (OSM) have received and reviewed Sjoberg, Evashenk and Associates (SEC) 2018/2019 March 2019 Audit Report titled "Performance Audit – Fiscal Year 2018/2019, Phase I Report: Bond Cost Estimates" (the Report). PPS appreciates the significant amount of data and documentation SEC reviewed in a short period of time to produce the Report. PPS also appreciates the thoroughness of the Report, the thoughtful conclusions and recommendations and the professionalism of the SEC staff.

As noted in the Report, PPS has already concluded and addressed many of the recommendations provided. PPS has prepared short responses to each of the recommendations.

SEC Recommendation #1: Develop a formal cost estimation methodology and apply consistently across projects regardless if developed in-house or by external consulates, including documentation of the reasons for any deviations from the established methodology.

PPS Response: PPS agrees with this recommendation. As evidenced in the materials that are routinely provided to the Board of Education for master planning and other project updates, OSM utilizes has a consistent methodology for conveying detailed project cost information. The approach includes providing a summary breakdown of the detailed cost estimate generated by a professional construction cost estimator, plus all additional costs (with noted assumptions for each item) that sum the project total. OSM provides this level of detail on all modernization and new construction projects to convey a high level of transparency and provide rationale behind the noted assumptions. Examples of this methodology and format can be seen in the master plans brought forward to the Board of Education for Kellogg, Madison, Lincoln and Benson. This same level of detail will be employed on future bond planning efforts.

SEC Recommendation #2: Compare and analyze cost estimate assumptions and factors with historic practices and other comparable bonds or districts to determine whether adjustments to estimation methodology seem warranted.

PPS Response: PPS agrees with this recommendation. As noted on page 29 of the Report, OSM operational staff stressed the importance of a bond cost estimation methodology that is understandable and traceable to underlying assumptions and records. OSM staff understands the value of providing cost data that is founded in professional support, reviewed and vetted prior to being developed into a recommendation. Future bond planning efforts will include professionally developed cost estimates and robust review of all cost assumptions.

SEC Recommendation #3: Establish a central location to retain final estimates at each project phase (master planning, schematic design, design document, construction document), including any supporting documentation used to develop each estimate.

PPS Response: PPS agrees with this recommendation. Currently OSM utilizes a "design phase approval" process that captures specific detailed project data at the end of each design phase including the current building plans (floor plans, elevations, etc), cost estimates, available contingency, current schedule status, stakeholder engagement plans, etc. All of this information is reviewed and stored electronically in OSM's project management software system for future use and reference. All 2017 bond modernization projects have, or will, complete a design phase approval at the end of each design phase including master planning, schematic design, design development, and construction documents.

SEC Recommendation #4: Discuss comparison of cost estimation methodology used with past PPS experiences, current market conditions, and estimates developed by peer districts when presenting cost estimates to the Board and public stakeholders.

PPS Response: PPS agrees with this recommendation. Similar to Recommendation #2, OSM understands the value of developing informed and vetted cost data. Future bond planning efforts will include robust review of all cost assumptions and comparisons to other relevant and comparable projects and programs.

SEC Recommendation #5: Categorize the reasons for variances in project costs, and aggregate those changes to the program-level to provide information on why costs varied from original bond, as well as report this information to the Board and public stakeholders.

PPS Response: PPS agrees with this recommendation. In November 2018 OSM prepared two documents for the Bond Accountability Committee's review. One document compared PPS project costs to other relevant K-12 projects nationally; the second document provided a detailed cost breakdown of Madison and Lincoln, broken down by individual Construction Specification Institute (CSI) division and compared each division of work to recently PPS projects: Roosevelt, Franklin and Grant. Additionally, OSM staff highlighted individual cost variances between the projects and provided a division by division analysis of the costs and provided reasons for the variances. In an effort to provide additional outside review of PPS project costs, in January 2019 OSM hired professional construction cost estimating firm, Rider Levell Bucknall, to compare current PPS project costs to other relevant K-12 projects.

SEC Recommendation #6: Conduct an analysis to determine to what degree various factors, especially scope changes and changes in construction costs, caused an increase in construction costs for the 2017 Bond projects. This could include comparing assumptions used across various project milestone reports and/or reconciling line items amounts to subcontractor bids.

PPS Response: PPS agrees with this recommendation. Similar to Recommendation #5, over the last 12 months OSM has provided detailed project cost comparison data and continues to develop and provide cost information as necessary and requested.

SEC Recommendation #7: Analyze results of variances to make adjustments to future estimation models and methodology as well as to analyze whether changes are needed in the delivery of projects to ensure stronger cost containment.

PPS Response: PPS agrees with this recommendation. Future bond planning efforts will include robust review of all cost assumptions and comparisons to other relevant and comparable projects and programs.

SEC Recommendation #8: Ensure project milestone reports use consistent data across all projects and clearly identify deviations.

PPS Response: PPS agrees with this recommendation. OSM utilizes standard operating procedures to ensure consistency between projects. Each project utilizes a project update template each month to report on project status. Similarly, regular reporting structures are utilized for the Bond Accountability Committee and quarterly project updates to the Board of Education. PPS and OSM will continue to incorporate feedback to improve on processes and procedures.