

# REPORT BY SCHOOL BUILDING PROJECTS ADVISORY COUNCIL



**February 7, 2014**

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## Executive Summary

The School Building Projects Advisory Council (the Council), convened by Governor Malloy, was established pursuant to section 10-292q of the Connecticut General Statutes to (1) develop model blueprints for new school building projects, (2) conduct studies, research and analyses, and (3) make recommendations for improvements to the school building process to the Governor and the joint standing committees of the General Assembly having cognizance of matters relating to appropriations and the budget of state agencies, education, and finance, revenue and bonding. Each of the goals reflects a need for the Council to identify ways that the state of Connecticut can administer grants for school construction projects in a way that is more cost-effective for Connecticut taxpayers. This report contains the Council's recommendations for improving the school building process and, in turn, reducing the collective cost to the state for such projects.

Through a series of meetings, a public hearing, and intense working sessions, the Council has developed findings regarding the state's school building process. They are as follows:

- FINDING #1: School construction costs are high in Connecticut.
- FINDING #2: The cost of renovation is generally less than new construction.
- FINDING #3: Construction costs vary widely across projects.
- FINDING #4: The state is not adequately empowered to oversee school construction and budgeting.
- FINDING #5: School districts are not motivated to complete projects on time or on budget.
- FINDING #6: A lack of standardization in procedures across state-funded projects may be increasing costs.
- FINDING #7: Data collection for school construction costs should be expanded.

For each finding, the Council offers recommendations at three levels: administrative fixes that would require, at most, a change in internal procedure or administrative process; legislative changes that would not require state spending or be revenue neutral; and legislative changes that would require an investment of capital or resources. We identify these recommendations as administrative changes, legislative, and legislative budgetary, respectively.

The Council's intention is that recommendations be acted on over the course of the next few legislative sessions as more information is gathered. It is important to note that recommendations often address more than one finding and, within the report, recommendations tied to each finding are identified. Further, more detailed commentary on specific recommendations and their associated timelines for implementation can be found within the "Recommendations and Schedule" section of this report (see page 17).

The following broad recommendations highlight the Council's suggestions to improving the process of administering grants for school construction projects in a manner that is most cost-efficient for Connecticut taxpayers:

- RECOMMENDATION #1: Establish a cap on maximum reimbursable project costs, whether cost-per-square foot or cost-per-student.
- RECOMMENDATION #2: Require districts to justify the need for a new facility when an existing building is available.
- RECOMMENDATION #3: Develop and implement design and construction standards for public schools.
- RECOMMENDATION #4: Provide school districts with school project planning, design standards, and construction services either through the DCS or a newly created school construction authority.
- RECOMMENDATION #5: Require districts to provide a formal evaluation of site conditions before completing the grant application.
- RECOMMENDATION #6: Require or encourage standardized procedures in school districts' contracting, procurement, and construction management processes.
- RECOMMENDATION #7: Link payments to a district's completion of audits and inspections.
- RECOMMENDATION #8: Create a process for consistent construction-related data collection, in addition to current grant data collection.
- RECOMMENDATION #9: Require districts to implement an enhanced life-cycle cost study, relating to structure, infrastructure, and finishes, using a standardized state-wide reporting format.
- RECOMMENDATION #10: Require a non-reimbursable application fee to offset state staff costs.
- RECOMMENDATION #11: Increase the membership of the Council by two.

## **Introduction**

### ***Background***

Section 132 of Public Act 11-51<sup>1</sup> established the School Building Projects Advisory Council (the Council), which shall meet at least quarterly to: (1) develop model blueprints for new school building projects, (2) conduct studies, research and analyses, and (3) make recommendations for improvements to the school building process to the Governor and the joint standing committees of the General Assembly having cognizance of matters relating to appropriations and the budget of state agencies, education, and finance, revenue and bonding.

### ***The Council's Work***

The Council, appointed by Governor Malloy, includes the Deputy Commissioner of Construction Services<sup>2</sup>, a representative of the Office of Policy and Management, an architect, a person with experience in school building projects matters, and a person with experience in engineering. The member with experience in school building project matters and the member with experience in engineering are both municipal employees who have been involved with numerous school building construction projects and are well-acquainted with Connecticut's process as it currently exists. In addition to the members of the Council, the state's Chief Architect and staff members of the DCS Bureau of School Facilities participated in meetings, as well as the working sessions.

Between the date the Council was established and the date of this report, the Council met six times and held a public hearing. In addition, the Council held several working sessions with the DCS Bureau of School Facilities and working meetings facilitated by STV, Incorporated. STV supported the group by collecting and conducting research and analyzing and presenting the research in a manner that allowed the Council to develop the findings found within this report. STV offered a unique perspective as it has been involved professionally with the New York City school construction projects and the Massachusetts School Building Authority.

### ***Research and Analysis***

With the assistance of STV, the Council examined different approaches to school construction, which can be found in nearby and neighboring jurisdictions. In New York City, for example, the city's School Construction Authority dictates what each school will look like, providing an original design to exacting standards. The Massachusetts School Building Authority, on the other hand, has developed a model school program. The models selected by the authority are based on proven built schools that provide excellent examples of school design that can be adapted to 20± percent of enrollment. The two main benefits this approach provides the districts are that the districts know

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<sup>1</sup> Now codified as section 10-292q of the Connecticut General Statutes.

<sup>2</sup> As of July 1, 2013, the Department of Construction Services has been consolidated into the Department of Administrative Services as the Division of Construction Services (DCS).

exactly what they are getting and the design time and expense can be greatly reduced. The third approach, which is used by the New Jersey School Development Authority, is a kit-of-parts approach that provides districts with model programs that describe the number and type of rooms and spaces to be provided in a school facility. The authority offers 4 basic programmatic models developed with 16 potential variations.

Further comparisons among the school building projects programs in Connecticut, New York City, Massachusetts, and New Jersey reveal several areas in which Connecticut stands alone. Of the four jurisdictions, only Connecticut does not have a school building authority. Also, of the four jurisdictions, Connecticut is the only jurisdiction that does not use standard contracts for design and construction. New York City and New Jersey<sup>3</sup> procure design, construction manager, and construction services, while Massachusetts has oversight over such procurements. Connecticut, on the other hand, does not procure such services at the state level for the local districts, nor does it have any involvement with or oversight over such procurements. New York City and New Jersey both provide construction manager services, while Massachusetts requires an owner's project manager. Connecticut requires neither an owner's project manager nor a construction manager.

## Findings

Through its review of relevant documentation, consultation with agency staff, and discussions with a range of public and private representatives, the Council identified a range of issues related to the current policies, processes, and practices of school construction financed by the state of Connecticut. The Council's seven most important findings are as follows:

- FINDING #1: School construction costs are high in Connecticut.
- FINDING #2: The cost of renovation is generally less than new construction.
- FINDING #3: Construction costs vary widely across projects.
- FINDING #4: The state is not adequately empowered to oversee school construction and budgeting.
- FINDING #5: School districts are not motivated to complete projects on time or on budget.
- FINDING #6: A lack of standardization in procedures across state-funded projects may be increasing costs.
- FINDING #7: Data collection for school construction costs should be expanded.

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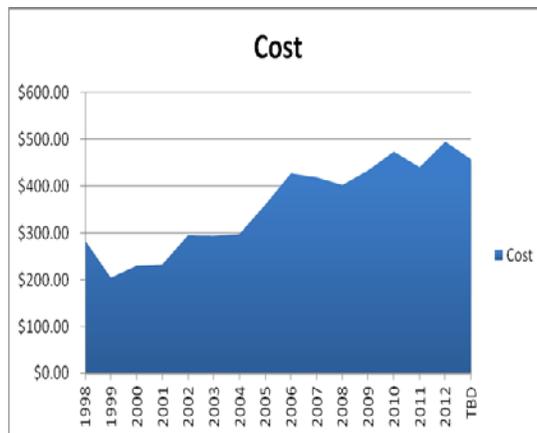
<sup>3</sup> New Jersey information applies only to the School Development Authority districts.

***FINDING #1 Costs for school construction have increased dramatically over the last 15 years.***

One of the very first questions considered by the Council was the extent to which the costs for school construction raised concerns. One way to capture the magnitude of the concern is to review cost increases over time. An independent report compiled by STV found that the average cost per square foot in the year 2012, even when adjusted for inflation, was 64 percent higher than construction costs in the year 2000. In addition, the Council analyzed cost per square foot data collected by the DCS Bureau of School Facilities for both new construction projects and for renovation projects. The following tables and graphs help illustrate the finding that school construction costs have skyrocketed over this 15-year period.

Graph 1 and Table 1 illustrate that for state-funded new school construction, regardless of whether the project is under construction or completed, the average cost is nearing \$500 per square foot.

**Graph 1—New School Construction Costs Per Square Foot by Year of Construction Commencement**

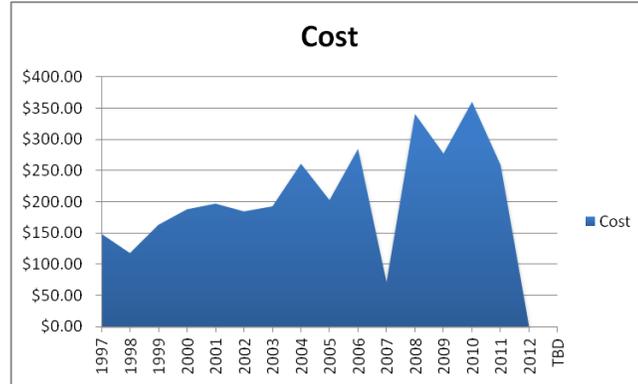


**Table 1—New School Construction Costs  
Per Square Foot by Year of Construction Commencement**

<b>Start Year</b>	<b>Cost per Square Foot</b>	<b>Number of Projects</b>
1998	\$284.60	3
1999	\$204.32	6
2000	\$230.08	7
2001	\$232.75	8
2002	\$295.21	7
2003	\$294.31	5
2004	\$297.92	9
2005	\$360.11	8
2006	\$427.52	13
2007	\$418.97	4
2008	\$402.52	11
2009	\$433.95	6
2010	\$474.28	4
2011	\$440.66	4
2012	\$495.54	2
2013	\$457.56	12

Graph 2 and Table 2 illustrate that for state-funded school renovation projects, regardless of whether the project is under construction or completed, the average cost is increasing, although the increase has been more modest than the increase in the cost of new construction over the same period.

**Graph 2—School Renovation Costs Per Square Foot by Year of Construction Commencement**



**Table 2—School Renovation Costs Per Square Foot by Year of Construction Commencement**

Start Year	Cost per Square Foot	Number of Projects
1997	\$148.25	6
1998	\$117.52	6
1999	\$162.75	6
2000	\$187.55	6
2001	\$196.65	4
2002	\$184.22	15
2003	\$192.31	8
2004	\$260.53	5
2005	\$202.28	8
2006	\$284.22	3
2007	\$70.55	2
2008	\$340.03	4
2009	\$276.62	5
2010	\$359.48	3
2011	\$258.54	1

## Recommendations

*Recommendations 1 through 6* are generally tied to *Finding #1* and are described in more detail within the “Recommendations and Schedule” section of this report.

Recommendations specific to *Finding #1* include:

### Administrative changes

- DCS should use its existing statutory authority [See Sec. 10-284(a)(5)] to establish a maximum reimbursement cap on the cost of construction, measured in cost per square foot for eligible space. Districts may fund ineligible space or upgrades above the reimbursement at their own expense. The cap shall be a dynamic number based on data collected on projects, primarily the average cost per square foot, for the particular type of projects from the preceding three year periods. Under no circumstances shall the cap exceed 125 percent of the average cost per square foot for all projects of the specific project type commenced or completed within the previous three years. When creating the cap, DCS should consider, among other factors, location, the type of project construction, the type of school facility and education program, and an inflation factor determined by the construction cost index. The cap could apply to overall project costs or to specific aspects of construction costs.

### Legislative

- If the project cap fails to reduce the discrepancies among towns’ project costs after the first three years of implementation, the Council would recommend legislative changes to the municipal reimbursement rate schedule (See Sec. 10-285a).

## ***FINDING #2 Renovation costs are, on average, less than the cost of new construction.***

Though intuitive, stressing that the cost of renovation is significantly lower than the cost of building new is important. The Council learned that many school districts that have been faced with the choice to rehabilitate an existing facility or build new have opted to build new. This choice results not only in higher costs to the state, but also comparatively negative life cycle, energy, and environmental impacts.

## Recommendations

*Recommendations 1 and 2* are generally tied to *Finding #2* and are described in more detail within the “Recommendations and Schedule” section of this report.

Recommendations specific to *Finding #2* include:

### **Administrative changes**

- DCS should require school districts to justify, in writing, a decision not to re-use an existing school facility. Districts should be required to explain why renovations—including additions to or reconfigurations of an existing building—would be inadequate to serve the needs of the district or exceed that cost of new construction. The strong presumption should be in favor of reusing the existing buildings wherever possible.

### ***FINDING #3 Construction costs vary widely across projects with many high-cost projects located in large cities.***

After the Council analyzed the basic cost data, it tried to identify some of the causes of the increased costs. Through data provided by DCS staff, the Council learned that school districts' average costs of construction varied widely.

In its independent report, STV found some correlation between reimbursement rates and school construction costs. Reimbursement rates vary significantly across school districts based on legislative formulas. STV examined data for all new and renovation school construction projects between 2000 and 2012, normalized to 2012 dollars, to make their determination.

Some correlation seems to exist between the projects in the state's largest cities and project costs. When it comes to new construction, for example, 13 of the 15 highest-cost projects under construction are located in Bridgeport, Hartford, New Haven<sup>4</sup>, and Waterbury, four of the municipalities with the highest reimbursement rates. While the average cost of 63 new projects under construction is \$416 per square foot, the costs of the 13 projects in these cities range from \$507 to \$602 per square foot.

Similarly, when it comes to renovation, 5 of the 10 highest-cost projects under construction are located in Hartford, New Haven, and Waterbury. While the average cost of 25 renovation projects is \$260 per square foot, the costs of the five projects in these cities range from \$287 to an astonishing \$524 per square foot. Note that the lower percentage of large-city projects represented in the renovation group may reflect that many of these large cities are opting for new construction rather than renovation.

Although the data is not entirely clear (see Finding #7), a rough correlation does seem to exist between the state's largest cities and the highest per square foot costs. Even if, with more information, this correlation proved to be statistically insignificant, the wide variation in the costs of schools should be a matter of great concern.

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<sup>4</sup> New Haven has generated a disproportionately large amount of state-funded school construction costs compared to its population. An independent STV report revealed that from 2000 to 2012, New Haven County, the third most populated county, accounted for \$1.8 billion in state-funded school construction costs, while Fairfield County the first most populated county, accounted for roughly half that amount.

## Recommendations

*Recommendations 1, 3, 4, 6 and 9* are generally tied to *Finding #3* and are described in more detail within the “Recommendations and Schedule” section of this report.

Recommendations specific to *Finding #3* include:

### Administrative changes:

- The DCS should use its existing statutory authority [See Sec. 10-284(a)(5)] to establish a maximum reimbursement cap on the cost of construction, measured in cost per square foot for eligible space.
- The DCS should use its existing statutory authority [See Sec. 10-283 and Sec. 10-284(a)(4)(A)] to develop design and construction standards that:
  - Are integrated with current design and construction guidelines, space standards, and statutory school construction grant calculations;
  - Address both materials and specifications;
  - Address both new construction and renovations;
  - Establish standards representing the minimum amount of educational instruction space (e.g., classrooms, labs, libraries, and so on) that excludes community spaces (e.g., auditoriums); and
  - Establish standards for minimum programmable space, such as classrooms (net), to circulatory and storage space (gross).
- The state should require municipalities to conduct an enhanced life-cycle cost analysis of indoor air quality and materials types to establish the long-term physical, environmental, and fiscal impact of relevant design and construction choices.

### Legislative budgetary:

- The DCS should develop model blueprints or, alternatively, design and construction standards, for new school building projects. For each type of school (i.e. elementary, high school, and so on), the goal would be to develop two or three model blueprints or a range of standards. Such design and construction standards shall address materials and specifications, as well as new construction and rehabilitation projects.
- The DCS should develop a kit-of-parts approach by first establishing standard programmatic spatial and equipment needs. Then it should establish planning parameter standards, such as double-loaded corridors, stacked mechanical cores, and so on.

## ***FINDING #4 The state is not adequately empowered to oversee school construction and budgeting.***

Despite the high construction costs and wide variations in project costs described in Findings 1 to 3, the state’s ability to restrict school districts’ spending on projects for which the state is providing the majority of the funding is severely restricted. By statute

and by regulation, the DCS is limited in terms of what it can require of school districts, in how it evaluates school construction projects, and (as Finding #5 will emphasize) in the incentives it can offer school districts to create economically efficient projects.

Five specific areas in which the department is limited in its decision-making capacity, input or control include:

- Construction Costs  
The state has not established a construction cost threshold or cap for school building projects although Section 119 of Public Act 11-51 authorizes the Commissioner of Construction Services to do so.
- Change Orders  
The state has not established a cap on the number of change orders, defined as increases in scope and cost that may be required or desired during the course of a project after the project has been approved and possibly after construction has begun. The state does not, however, reimburse change orders over and above 5 percent of the project cost when the total project cost exceeds ten million dollars. At the beginning of a project, the state does not require school districts to conduct serious reviews of hazardous conditions, site soil conditions, or other inherent conditions that could result in later cost overruns.
- Program or Uses of a School  
The state has little authority to shape the program, meaning the uses and space allocations for each use, of a state-funded school construction project. The state's control over a school's program is limited to control over allowed area per student. There are no controls for specific educational elements, such as percentage of instruction space, and no net-to-gross standard that dictates how much of a school may be used for circulation, maintenance, or other non-educational versus educational uses.
- Educational Performance and Overall Design  
No measure for educational performance, such as the number of science instruction spaces or classroom minimum requirements, exist. Overall design review is limited to code compliance and drawing quality.
- Completion within Budget  
STV collected data on 28 recently completed school construction projects that revealed cost overruns on half of the projects. The self-reported survey, while unscientific, reflects a lack of commitment among some school districts regarding completing projects on time and within budget.

Taken together these five areas suggest that school districts are free to make major decisions about their projects that may ultimately contribute to wide variations in project costs and may also drive up those costs with virtually no consequences to the districts.

## Recommendations

*Recommendations 3 through 8* are generally tied to *Finding #4* and are described in more detail within the “Recommendations and Schedule” section of this report.

Recommendations specific to *Finding #4* include:

### Legislative:

- Require school districts to conduct formal and full-scale site and building investigations before the completion of the grant applications to help control unforeseen costs and change orders.

### Legislative budgetary:

- The state should establish a school construction authority or a K through 12 school facilities construction division within DCS to assist districts with planning, design standards, and construction management.
- A fee based on the size and cost of the project and/or town wealth could be required of towns to create a revenue stream to make this new authority or division self-sustaining.

## ***FINDING #5 School districts have too few benefits to save money or complete projects on time.***

The Council found that school districts do not have enough benefits to support state priorities of saving money and closing out projects in a timely fashion. Project grants are awarded as an entitlement to qualifying projects with no cap on construction costs for any project type. In addition, certain costly materials and finishes are not excluded from reimbursement, potentially leading to some districts choosing higher-end materials and finishes rather than materials and finishes that are more cost-effective but equally suitable. At the same time, school districts, particularly smaller or rural districts, may lack the resources or expertise to manage large-scale construction projects and may have little incentive to cultivate such additional resources or expertise. Finally, few benefits of or requirements for timely completion either of the project itself or of the final audit exist.

## Recommendations

*Recommendations 1, 4, 6, 7 and 9* are generally tied to *Finding #5* and are described in more detail within the “Recommendations and Schedule” section of this report.

Recommendations specific to *Finding #5* include:

**Administrative changes:**

- Establish a school construction division within DCS to assist school districts with planning, design, and construction management.
- Enforce existing statutory authority [See Sec. 10-287(d)] to insist an expedient closure to projects.

**Legislative:**

- In concert with the creation of a school construction authority or a school facilities construction division within DCS, establish a school construction review panel to review the resources and plans of a school district to determine if projects can be treated as other state agency DAS administered projects.
- Increase withholding (retainage) during progress payments from 5 percent of the grant to 7 percent of the grant, pending completion of an audit.
- Conduct final inspection or substantial completion reviews before the school district submitting a request for the release of the final payment.

**Legislative budgetary:**

- Establish a Connecticut School Construction Authority. After the authority approves a project, DCS shall move to construction as it does with other agency administered projects.

***FINDING #6 A lack of standardization in procedures across state-funded projects may be increasing costs.***

In addition to the constraints on the state’s ability to substantially shape school construction projects, the state is limited in its ability to shape the procedures that school districts use to award and administer projects. A lack of standardization in the way that school districts administer projects almost certainly increases costs for the state. Moreover, lack of standardization is inconsistent with the state’s approach to other project types, such as transportation and public works projects, where contracts and procedures are highly standardized.

Five specific areas in which the DCS has limited decision-making capacity, input or control include:

- Procurement Procedures  
Each school district has its own procurement procedures, requiring adjusted reviews at the state level. In addition, school districts may vary with respect to whether they award bids based on the lowest cost—choosing the absolute lowest price—or the best value—the best price for qualified contractors when price is not the sole consideration. DCS has no oversight of or involvement with the manner in which bids are reviewed or approved.
- Contract Forms  
Each school district has its own form(s) of contracts with various entities (construction manager, architect, engineers, and other professional consultants) involved in a school construction project. Even school districts using the same

construction management type can have wildly different contracts. These variations increase the level of review required by the state and challenge already overburdened state staff.

- Construction Management/Project Oversight Preferences  
The state has not identified a preferred method for districts to manage or oversee the construction process. The state could, for example, require districts to use a construction management form of project oversight. Alternatively or in addition, it could require that school districts use an owner’s representative to manage design and costs. The state also does not require a project management plan.
- Timeliness of Submissions  
School districts have no time limit within which they must submit change orders or close out a project. This leads to unnecessary delays in the process and creates undue burdens for DCS staff.
- Project Planning/Design  
DCS has no oversight of or involvement with a district’s project planning or design process, other than code review.

## **Recommendations**

*Recommendations 3, 4, 6, 7 and 8* are generally tied to *Finding #6* and are described in more detail within the “Recommendations and Schedule” section of this report.

Recommendations specific to *Finding #6* include:

### **Administrative changes:**

- Establish procedures for procurement of construction services of more than \$5 million and professional services on the basis of the “best value” selection process, for which price is not the only selection factor, modeled after current DCS procedures.
- Require each project to submit and conform to a project management plan.
- Reduce the timeframe of submissions on change orders to three months, but not later than project close out.
- Reduce the timeframe of project close out. Allow school districts to apply for waivers to extend project close out completion if an Act of God makes completion impossible.
- Develop and implement a design and construction team evaluation process.

### **Legislative:**

- Require school districts to use state-approved contracts for design and construction services. DCS shall develop such contracts in consultation with local officials who currently administer school construction projects.
- Require school districts to hire a state-approved Owner’s Project Manager. Consider having the state hold the contract with such project manager.

## ***FINDING #7 Data collection for school construction projects costs is inadequate.***

Finally, and overarching all of the preceding findings, the DCS does not have adequate resources or tools to collect sufficient construction-related data that would allow it to thoroughly evaluate projects or to make comparisons among projects. Currently, the DCS database is designed to capture data to comply with statutes for calculation of school construction grants. The database contains more than 300 data elements, including original costs authorized, current project costs, re-authorized amounts, and final costs. These data elements are insufficient, however, to allow careful and detailed evaluation of costs per square foot, costs per student, or special factors driving costs. For example, no data exists on the scheduled time versus actual time taken for project completion. The limited data had a direct affect on the amount of analysis the council was able to conduct and the extent of its recommendations.

### **Recommendations**

***Recommendations 8 and 10*** are generally tied to ***Finding #7*** and are described in more detail within the “Recommendations and Schedule” section of this report.

Recommendations specific to ***Finding #7*** include:

#### **Administrative changes:**

- Collect more detailed construction-related information from districts at the time of project document submission, as well as at project close out as a matter of course.
- Require each district to submit for each school construction project a detailed cost estimate in UniFormat II, Level 3, which includes a listing of all eligible and ineligible costs. Cost estimates should be submitted at the completion of design documents and construction documents in the design phase of construction and at project completion. Project costs are to include all soft and hard costs of school construction. Such costs may include, but are not limited to, site acquisition, demolition, remediation, temporary facilities, swing space costs, off-site costs, professional design fees, project management fees, construction interest, escalation, and any other fees that may impact the cost of construction.

#### **Legislative budgetary:**

- Redesign or acquire software to perform grant administration and reporting functions to collect additional construction-related data on projects and processes, including both projected and final numbers for each project’s
  - Cost per square foot;
  - Cost per student;
  - Cost breakdown by UNIFORMAT (classification for building specifications, cost estimating, and cost analysis); and
  - Costs for various professional services and other soft costs.

## Recommendations and Schedule

The Council suggests 11 recommendations, each of which may overlap as they address particular findings. The recommendations vary from actions that the agency can accomplish on its own through administrative policy changes to actions needing legislative approval to actions needing legislative approval and budgetary commitments. The Council intends that the recommendations would be implemented over the next few years as more information is gathered and relevant stakeholders are consulted. The Council's 11 recommendations are as follows:

RECOMMENDATION #1: Establish a cap on maximum reimbursable project costs, whether cost-per-square foot or cost-per-student.

RECOMMENDATION #2: Require districts to justify the need for a new facility when an existing building is available.

RECOMMENDATION #3: Develop and implement design and construction standards for public schools.

RECOMMENDATION #4: Provide school districts with school project planning, design standards, and construction services either through the DCS or a newly created school construction authority.

RECOMMENDATION #5: Require districts to provide a formal evaluation of site conditions before completing the grant application.

RECOMMENDATION #6: Require or encourage standardized procedures in school districts' contracting, procurement, and construction management processes.

RECOMMENDATION #7: Link payments to a district's completion of audits and inspections.

RECOMMENDATION #8: Create a process for consistent construction-related data collection, in addition to current grant data collection.

RECOMMENDATION #9: Require districts to implement an enhanced life-cycle cost study, relating to structure, infrastructure, and finishes, using a standardized state-wide reporting format.

RECOMMENDATION #10: Require a non-reimbursable application fee to offset state staff costs.

RECOMMENDATION #11: Increase the membership of the Council by two.

### ***RECOMMENDATION #1 Establish a cap on maximum reimbursable project costs, whether cost-per-square foot or cost-per-student.***

The agency has submitted a budget request to hire a consultant to establish a maximum cost per square foot based on location, type of construction, type of facility and education program, and cost of escalation determined by the construction cost index. The consultant will work in conjunction with the Council and a working group that may include representatives of boards of education, school business managers,

municipal finance managers, architects, and construction experts. The agency shall submit a proposal establishing a cap pursuant to subsection (a) of section 10-284 of the Connecticut General Statutes during the **2015 legislative session**.

***RECOMMENDATION #2 Require districts to justify non-use of an existing building when one is available.***

School districts are required to justify cost of new in lieu of renovation pursuant to section 10-285a of the Connecticut General Statutes. The **agency established guidelines** for “new in lieu of renovation” that were made effective July 10, 2013.

***RECOMMENDATION #3 Develop and implement design and construction standards for public schools.***

The agency submitted a budget request to hire a consultant to develop design and construction standards. The consultant will work with the Council and with relevant constituent groups for input. The agency shall submit a proposal to implement design and construction standards pursuant to section 10-283 and subsection (a) of section 10-284 of the Connecticut General Statutes during the **2015 legislative session**.

***RECOMMENDATION #4 Provide school districts with school project planning, design, and construction either through the DCS or a newly created school construction authority.***

Establishing an authority or creating a division within the agency will require addition of staff. The agency will develop a proposal to create a school construction authority or school construction division in consultation with the Office of Policy and Management and the State Department of Education. Submitting such proposal shall be reserved for when the state’s budget will allow.

***RECOMMENDATION #5 Require districts to provide a formal evaluation of site conditions before completing the grant application.***

While the SBPAC was focused on environmental concerns with regard to the evaluation of site conditions, the School Safety Infrastructure Council (SSIC), which is charged with developing school safety standards by January 1, 2014, took an all-hazards approach to its work. Included within the SSIC standards will be a requirement that districts seeking school construction grant funding conduct a school facility assessment. This assessment will include an analysis of the site conditions.

Every school construction project submitting an application on or after July 1, 2014, will be required to meet SSIC standards.

***RECOMMENDATION #6 Require or encourage standardized procedures in school districts' contracting, procurement, and construction management.***

Standardization of contracting, procurement and construction management will need to be done in coordination with the establishment of a school construction authority or division within the agency. This proposal shall be developed and submitted in conjunction with *Recommendation #4*.

***RECOMMENDATION #7 Link payments to a district's completion of audits and inspections.***

The Council will meet with construction managers and local finance officials to determine how best to establish a policy to closeout construction within 18 months of substantial completion of the project. The proposal may include a provision to increase grant withholding from 5 percent to 7 percent pursuant to CGS 10-287i. If an effective and realistic policy can be established, the agency may submit it during the **2015 legislative session**.

***RECOMMENDATION #8 Create a process for consistent construction-related data collection, in addition to current grant data collection.***

The agency has drafted an **administrative policy** to require cost estimate data to be submitted in Unifomat II, Level 3, E-1557 with an effective date of January 1, 2014. Unifomat II is a system well known in the industry by architects and construction professionals involved in major construction projects, including school construction. The collection of construction data in this format requires no additional staff and helps the agency create a database of information. When the agency has acquired sufficient amounts of data and the state budget will allow for additional staff or the creation of a school building authority or school building division, the agency will submit a request to add staff to analyze the accumulated data.

***RECOMMENDATION #9 Require districts to implement an enhanced life-cycle cost study, relating to structure, infrastructure, and finishes, using a standardized state-wide reporting format.***

The agency will conduct an enhanced life cycle cost study in coordination with the creation of standardized procedures for contracting, procurement and construction management as part of the proposal to establish a school building authority or school building division. Any move to standardization will be phased-in to avoid compliance issues. Standard construction contracts will require the collection of operations and maintenance manuals and maintenance staff training at turnover of the facility to ensure proper maintenance to protect building and equipment warranties.

***RECOMMENDATION #10 Require a non-reimbursable application fee to offset state staff costs.***

To offset the cost of additional project staff to manage the school construction process, the agency may submit a proposal during the **2015 legislative session** to take an automatic deduction from each school construction project upon application approval. The agency would implement the assessment of such a fee in a way that would allow local entities time to prepare their budgets.

***RECOMMENDATION #11 Increase the membership of the Council by two.***

Pursuant to the passage of PA 13-3 concerning matters related to school security, the Council recommends amending section 10-292q of the Connecticut General Statutes during the **2014 legislative session** to increase the membership of the SBPAC by two members, appointed by the Governor, to include school security experience.

## **Conclusion**

The Council's work will continue as Public Act 13-3 added a requirement for the Council to consider the SSIC's safety infrastructure standards when creating model blueprints and the Council will work with the consultant to be hired by the agency to fulfill certain recommendations concerning establishing a cap on maximum reimbursable project costs and designing standardized design and construction standards.

To date, the Council's work points to the necessity of capping the reimbursement or the cost per square foot of the construction projects as the higher the reimbursement, more than likely, the higher the square foot cost. Any cap would need to be a dynamic

maximum cost per square foot and correspond to the model schools or the kit-of-parts system. The model school or kit-of-part system will help prevent waivers with regard to data collection and submission, another driver of costs and extended time.

Any serious consideration of the costs of school construction in Connecticut must include an examination of the legislative tradition of exempting certain projects from the administrative controls the Council has presented. Known as the “notwithstanding legislation”, these legislative exemptions can add tens of millions to hundreds of millions of dollars to the annual total cost of school construction in this state.

While standardization of public school design across the state might prove anathema to a population and a school district system steeped in the tradition of “home rule” at the municipal and school district level, the standardization of the design and construction *process* should be acceptable with the understanding that cost, schedule and quality are controlled through the process and statewide standards for performance will serve to improve not only the construction of but also the long term operation of these publicly owned assets.

Many of the recommendations in this report cannot be achieved without first establishing either a school building authority or a department within the agency. In addition, exercising the agency’s statutory authority to establish a cap on maximum reimbursable project costs (see Recommendation #1) and to develop and implement design and construction standards (see Recommendation #3) in coordination with model blueprints or kit of parts are the logical first steps. As such, pursuant to the Council’s recommendations, the agency will seek funding to support these endeavors in the short term before exploring other legislative and legislative budgetary recommendations.

In addition, to facilitate the ongoing work of the Council, the membership should be expanded in the upcoming 2014 legislative session. Suggested additions include someone with a construction background and someone with experience in an all-hazards approach to school safety and security.

## Appendix A

### Description of School Construction Process

When a school district chooses to apply for a grant from the State for a school construction project, there are four steps: (1) the grant application, (2) the grant commitment by the State, (3) the design process (including plan review by the State), and (4) the construction and grant payment stage during which the project is being completed and monies being disbursed by the State. Key aspects of each of these four stages, which involve the Bureau of School Facilities (BSF) at the Department of Construction Services (DCS), are described below.

#### (1) Grant Application Process

- Grant applications may be submitted for new/renovation/addition/alteration/energy conservation projects.
- Total project cost must exceed \$10,000 to qualify for a grant.
- Grant applications for stand-alone roof replacement, relocatable classrooms, and code work are not included on annual priority lists.
- Grant applications must include:
  - o Local resolutions for Board of Education submission of grant application; formation of a building committee; and preparation of schematics and drawings.
  - o Designated applicant (superintendent, board)
  - o Proof of locally authorized funding for district's portion
  - o Educational Specifications (Ed Specs)
  - o Enrollment projections, for projects other than stand-alone roof replacements, code work or BOE facility
  - o Cost estimate.
- DCS/BSF reviews the entire grant application.
- Educational specifications describing the details of a proposed project do not always include a definition of programmatic spaces.
- DCS/BSF assigns a priority list category placement code – A, B, or C following review of entire application.
- DCS/BSF forwards the enrollment projections to the Department of Education (DOE). DOE will review and determination whether the projection is acceptable.
- Enrollment projections are done by district by an outside consultant for an 8-year span.
- DCS/BSF functions in the role of assisting districts develop complete applications providing guidance and review as part of their service working to expedite application review.
- Classroom size, programmatic components, and space program are locally driven and not part of the application review process.
- Applications are school-specific. Multiple facilities may not be combined within a single application.
- Districts may file more than one application if application requirements for each school construction project can be met.

- Sites must be inspected and approved by the Office of School Facilities, there are grant reimbursement limits on site size, remediation costs, and reimbursement.
- Larger districts with more schools may have a greater level of experience in filing applications, while smaller districts file infrequently and may need more application assistance.
- The grant calculation is a complicated mechanism driven by many factors including legislation; the grant calculation may change over the course of the project.
- Note that technical high schools are State-owned; statutory provisions governing the State school construction grant program do not apply to the Connecticut Technical High School System.

## **(2) Grant Commitment Process**

(For grant applications other than stand-alone roof replacement, code work, and relocatable classrooms)

- Grant applications completed by June 30 are eligible for consideration on the Priority List
- Applications are assigned a priority category A, B or C by DCS/BSF.
- In past years, all completed grant applications appearing on the Priority List have been authorized for grant commitments.
- There is no recommendation by DCS/BSF for approval or disapproval. DCS/BSF review is limited to the grant application only for completeness.
- The Commissioner's Recommendation for the Priority List is due December 15 of each year, reviewed by the Connecticut Legislature's Education Committee, then sent to the Legislature for approval. On approval, it is sent to the Governor for signature.
- DCS/BSF has no control over the number of submissions made each year or provisions to out-source or have additional assistance during review process.

## **(3) Design Process /Plan Review**

- Districts select and contract with the architectural and engineering team independently, and no DCS approval is required.
- Design costs are included in the grant application as part of total project cost.
- Following notice of commitment for funding DCS has a comprehensive PREP (project kick-off), and plan review process.
- Plan Review considers constructability and coordination. The DCS/BSF reviewer looks for ineligible items and notifies districts.
- Design review is limited to code conformance and drawing quality.
- Design reviews that DCS cannot complete in the allowed time (30-days) may be done by the local authority at the expense of the total project cost.
- There is a maximum square-foot per student reimbursable size.
- There are no requirements for net/gross space efficiency or program conformance

## **(4) Construction / Grant Payment Process**

- Bidding must conform with CT laws for procurement.
- DCS has no bid review or approval. All bidding and contracting is handled by the local municipality.
- DCS/BSF has a standard form of agreement with a contractor, but its use is not mandated.

- During construction the local municipality holds construction contracts.
- All approved grant payments are made to the local municipality for disbursement.
- Districts may submit for progress grant payments bi-monthly (by the first of each month).
- DCS reviews payment requests, and project file including construction invoices each time payment requests are submitted; typically 1-30 payment request submitted for each construction project over the course of the project; approved payment requests are paid approximately 45 days after the monthly cut-off of the first of the month.
- There is no construction review by DCS.
- Eligible change-order costs exceeding 5% of the authorized amount are paid below the reimbursement rate.
- There is a project closeout process and form.
- There can be significant time lapses between completion of construction and submission of final costs for a project.
- Grant funding can be re-authorized during design or construction (Form EDO49R) – this requires justification and review.

## Appendix B

### List of Relevant Documents

1. Public Act 11-51(Sec. 114-132)  
(<http://www.cga.ct.gov/2011/ACT/PA/2011PA-00051-R00HB-06650-PA.htm>)
2. Public Act 11-61(Sec. 93-130)  
(<http://www.cga.ct.gov/2011/ACT/PA/2011PA-00061-R00HB-06652-PA.htm>)
3. General Discussion of Grant Eligibility  
(<http://www.ct.gov/dcs/lib/dcs/bsf/grantprocess/projelig.pdf>)
4. Chapter 173 Of The Connecticut General Statutes (Revised to January 1, 2009)  
(<http://www.ct.gov/dcs/lib/dcs/bsf/statutesregs/cgschap173rev01-01-11.pdf>)
5. School Construction Grants  
(<http://www.sde.ct.gov/sde/lib/sde/pdf/dgm/sfu/guide02/process.pdf>)
6. Educational Specifications  
(<http://www.sde.ct.gov/sde/lib/sde/pdf/dgm/sfu/guide02/edspec.pdf>)
7. Regulations Of The State Board Of Education Concerning School Construction Grants (<http://www.ct.gov/dcs/lib/dcs/bsf/statutesregs/regs1095.pdf>)
8. Construction Document Guidelines For School Districts & Design Professionals  
(<http://www.sde.ct.gov/sde/cwp/view.asp?a=2636&q=320546>)
9. Ineligible And Limited Eligible Costs  
(<http://www.sde.ct.gov/sde/lib/sde/pdf/dgm/sfu/guide02/inelglmt.pdf>)
10. 2013 School Building Priority Category list  
(<http://www.sde.ct.gov/sde/lib/sde/PDF/dgm/sfu/..%5Csfu%5Cpl2013.pdf>)
11. Forms and Instructions for Progress Payment Requests/Annual Projections (ED046,ED046A) (<http://www.sde.ct.gov/sde/cwp/view.asp?a=2636&q=320560>)
12. Forms and Instructions for School Building Project Data (ED049,ED049R,ED049F)  
(<http://www.sde.ct.gov/sde/cwp/view.asp?a=2636&q=320560>)
13. Forms and Instructions for Plan Review (ED042,ED042CO, Nat. Lt./Wireless Tech., I.A.Q., Seismic Cert's)  
(<http://www.sde.ct.gov/sde/cwp/view.asp?a=2636&q=320560>)
14. Forms and Instructions for Ineligible and limited eligible costs worksheet  
(<http://www.sde.ct.gov/sde/cwp/view.asp?a=2636&q=320560>)
15. DCS Library  
(<http://www.ct.gov/dcs/cwp/view.asp?a=4223&q=493978#7000>)
16. Form For Construction Closeout For Project Accounting  
([https://docs.google.com/viewer?a=v&q=cache:daINuwDF7xgJ:www.ct.gov/dcs/lib/dcs/bdc/forms/7990\\_construction\\_closeout\\_for\\_project\\_accounting.doc+&hl=en&gl=us&pid=bl&srcid=ADGEEESgXfoeFSXXugZz\\_jnabjMKXDiboMMOW8tWnhPnMkRJqu6BxIxcFPetbG92cSLJUWjKYsQHBoOhIRcyh1zU-81Ne87J3jAbB8IHwlzpr\\_Ui2sdfdiSmf1Mw7RrZvGdmRUU8YJCUi&sig=AHIEtbQwneMDhtSehJ1\\_aT7pZa2UILoX8A](https://docs.google.com/viewer?a=v&q=cache:daINuwDF7xgJ:www.ct.gov/dcs/lib/dcs/bdc/forms/7990_construction_closeout_for_project_accounting.doc+&hl=en&gl=us&pid=bl&srcid=ADGEEESgXfoeFSXXugZz_jnabjMKXDiboMMOW8tWnhPnMkRJqu6BxIxcFPetbG92cSLJUWjKYsQHBoOhIRcyh1zU-81Ne87J3jAbB8IHwlzpr_Ui2sdfdiSmf1Mw7RrZvGdmRUU8YJCUi&sig=AHIEtbQwneMDhtSehJ1_aT7pZa2UILoX8A))
17. Life Cycle Cost Analysis  
([http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=4&ved=0CEYQFjAD&url=http%3A%2F%2Fwww.ct.gov%2Fdpw%2Flib%2Fdpw%2FLCCA\\_Guidance\\_Document.doc&ei=Wmr5UKfDGcew0AGqslGwCw&usg=AFQjCNF34Kh8VaeVb4A3IY3F-UZeKv6Ng](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=4&ved=0CEYQFjAD&url=http%3A%2F%2Fwww.ct.gov%2Fdpw%2Flib%2Fdpw%2FLCCA_Guidance_Document.doc&ei=Wmr5UKfDGcew0AGqslGwCw&usg=AFQjCNF34Kh8VaeVb4A3IY3F-UZeKv6Ng))

18. Life Cycle Cost Analysis Determination Request  
([http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&cad=rja&ved=0CDAQFjAA&url=http%3A%2F%2Fwww.ct.gov%2Fdpw%2Flib%2Fdpw%2F310f\\_life\\_cycle\\_cost\\_analysis\\_determination\\_request.doc&ei=AGv5ULr1JO670QGa84CAAg&usg=AFQjCNESo4Z7iTH-LfK9r03Ykhq3rp4uJg](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&cad=rja&ved=0CDAQFjAA&url=http%3A%2F%2Fwww.ct.gov%2Fdpw%2Flib%2Fdpw%2F310f_life_cycle_cost_analysis_determination_request.doc&ei=AGv5ULr1JO670QGa84CAAg&usg=AFQjCNESo4Z7iTH-LfK9r03Ykhq3rp4uJg))
19. Instructions for completing cost estimating worksheet  
(<http://www.sde.ct.gov/sde/lib/sde/PDF/dgm/sfu/forms/costws.pdf>)

## **Appendix C**

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### **STV White Paper: Issues that Impact Public School Construction in the United States**

## ***Issues that Impact Public School Construction in the United States***

### **US School Construction General Overview**

US school construction reports of 2011 reported that the US has 98,706 PK-12 grade public schools, out of which 4,694 are public charter schools. About 90% of 55.5 million students in the US are part of the public schooling system. The total area of public school building space in the US equates to 6.6 billion gross square feet, with each school district managing about 1 million acres of school building site area. (PK-12 Public School Facility Infrastructure Fact Sheet, 2011).

### **Funding Sources for School Construction**

The source of funding depends on the state laws, district regulations and the type of school. Most funding is from state and local taxes with a minor 8.6% or less of federal funding. In some states such as the District of Columbia the state may contribute 100% of the school facility construction cost, while other states do not contribute to school construction funding. The average state contribution of funds is about 30%, including both ends of the spectrum. School operation and maintenance repair costs are funded by the districts operating budget, which consists of an average of 90% local and state funding and 10% federal funding (PK-12 Public School Facility Infrastructure Fact Sheet, 2011).

Public school facility investment aligns with the wealth of the community the school is located in. Between 1995-2004 schools in low wealth zip codes had one third the funding for capital projects as schools in high wealth zip codes (PK-12 Public School Facility Infrastructure Fact Sheet, 2011).

### **Factors Affecting School Construction Costs**

#### **1. Program Management**

According to a study completed by the Public School Capital Improvement Programs, all well-managed capital improvement programs consist of six basic elements: 1) accurate information systems; 2) comprehensive, multifaceted planning; 3) clear decision-making structures; 4) sufficient and stable funding; 5) skilled project management; and 6) effective oversight and monitoring. (**Public School Capital Improvement Programs (1999) (DC)**).

- a. *Accurate Information Systems*: refers to a database of all buildings and their associated data such as age, size, location, use, cost, capacity, condition, operating budget, market value, etc. The importance of maintaining an accurate database of school information supports the decision making process and the setting of needs-based priorities for capital projects. Some states such as Massachusetts use Geographic Information Systems (GIS) to support in the decision making process of building and/or renovating public schools.
- b. *Sound Planning*: according to the study, there are three plans that comprise sound planning, long-range facilities master plan, capital improvement plan (CIP), and annual maintenance plan. The long-range facilities master plan must include at least two capital budget cycles, usually five or six years

each. This plan must be developed in cooperation with all school stakeholders to ensure that the end user's needs are met. Examples of states that require long-range facilities plans are Maryland and Virginia, where each county is required to submit a long-range facilities plan. The state is required to review that plan and approve it. For information about the CIPs and annual maintenance plans, the reader is referred to the *"Public School Capital Improvement Programs" study conducted by The 21<sup>st</sup> Century School Fund*.

- c. *Skilled Project Management*: the study highlights that hiring a construction manager early in the design process to act as the school district's agent places the school system in greater control of the project. The CM increases the potential of effective coordination, constructability analysis, and value engineering, thus reducing the overall costs of construction.
- d. *Effective Oversight and Monitoring*: the state's role in school construction varies, but the commonalities between different states include, regular reporting to boards of education and routine documentation of the scope, progress and cost of projects. As well as external audits of expenditure and periodic management review. Examples of states with stronger oversight measures and involvement in the school construction process are Maryland, West Virginia, and Florida. Florida requires a regular audit of each school district to evaluate the financial management practices, planning, development of school capacity estimates, commissioning, capital budgeting, procurement etc. For evaluation measures please refer to the *"Public School Capital Improvement Programs" study conducted by The 21<sup>st</sup> Century School Fund*.

The study also reviewed seven school systems' capital improvement programs and concluded that there are three different models for the program management of capital improvement programs by school districts:

- a. Local school system management (in-house management)

This model requires that the public school system has in-house capabilities of design, engineering and project management. The school system employees are responsible for procuring contracts, and budget management and control. Refer to the *"Public School Capital Improvement Programs" study conducted by The 21<sup>st</sup> Century School Fund* for examples of organization structures that followed this model. Following this model, school districts still rely on consultants and construction management firms for large projects, while retaining between 20 – 50 qualified staff. The model also depends on the state's involvement in the decisions and approvals of projects. For example the State of Virginia has minimal control, while the State of Maryland is more involved school construction division. Counties in Virginia have more in-house staff and manage construction in-house, while counties in Maryland tend to outsource a majority of their construction work to consultants, while retaining some in-house staff.

School systems having local management have similarities. The construction divisions all have a **strong relationship with the public**, maintained by regular communication, formal reporting to boards of education and awareness of legal policies and regulations. **Construction management personnel** all have **qualified, highly experienced directors**, and a stable leadership for capital programs. They have a **strong relationship with the private sector**, maintained through cooperation with design and construction firms on procurement processes, and regular communication. Their procurement process is specialized to meet their program needs, architects and CMs are selected based on quality, work is approved and paid in a timely manner, and construction delivery is facilitated through the CM

personnel. The in-house staff **maintains control** over any construction project by regular audits of the construction budget, regular reporting, a strong sense of pride if a project meets requirements, awareness of legal protection required on any construction project, reviews of work history with potential contractors, and in-depth evaluation of all completed work.

b. Management by another public agency (other governmental management)

Examples of this model are District of Columbia and New York City. The US Army Corps of Engineers has been managing the school construction program in DC since 1998 and the New York City School Construction Authority has been managing the capital improvement program of the New York City Board of Education since 1988.

c. Management by private sector firms (private-sector management)

This model involved complete dependence on the private sector to manage school construction. This is implemented by the Chicago Public School System, where all aspects of capital program management are out-sourced, including overall management, project oversight, budget control and tracking, and project management. The program was outsourced to a team of 11 private sector firms, forming the firm EDGE (Education Design Group). Edge developed a streamlined process that reduced the typical school construction time by 10 months; this was possible by creating a prototype of new school design, bulk purchasing of construction components, pre-qualification of contractors and suppliers, standardized project documentation and budgeting, and comprehensive project tracking.

## 2. Delivery Methods

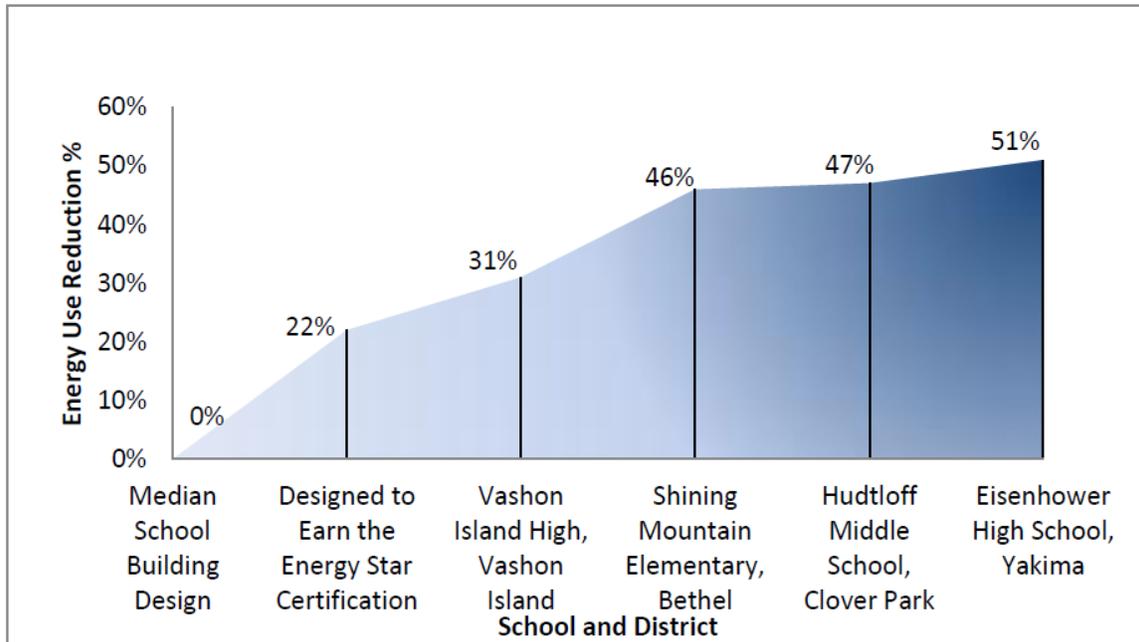
**Table 1: AIA and Strang, CM eJournal**

	<b>Design-Bid-Build</b>	<b>Construction Manager at Risk</b>	<b>Design-Build</b>
Advantages	<ul style="list-style-type: none"> <li>• Universally agreed upon roles</li> <li>• Competitive Price Control</li> <li>• Thwarts Favoritism</li> <li>• Provides opportunities for prequalified bidders</li> <li>• More detailed and complete documents for bidding</li> </ul>	<ul style="list-style-type: none"> <li>• Accepted by governing bodies</li> <li>• Allows procurement of construction team based on evaluation criteria not just lowest bid</li> <li>• Opportunity for fast-track</li> <li>• Constructability analysis and value engineering during design phase</li> <li>• Reduced risk of litigation costs, and lost use time of the facility</li> </ul>	<ul style="list-style-type: none"> <li>• Design team and contractor are procured together – complete team approach</li> <li>• Opportunity for fast-track</li> <li>• Simplified documents and bidding</li> <li>• Construction expertise is available during design</li> <li>• Less adversarial relationship between design and construction teams</li> </ul>

D i s a d v a n t a g e s	<ul style="list-style-type: none"> <li>• Lowest responsible bidder (not most qualified)</li> <li>• Construction team is hired too late – no constructability analysis</li> <li>• Conflict prone</li> <li>• More change orders</li> <li>• Fast-track is not possible</li> <li>• Higher probability of change orders, time delay, scope reduction, project cancellation</li> </ul>	<ul style="list-style-type: none"> <li>• Additional contractor fees due to additional CM during design responsibilities</li> <li>• Both teams must be experienced (A/E and CM)</li> <li>• Possibility for inflated cost estimates due to ensure the CMs GMP is met</li> </ul>	<ul style="list-style-type: none"> <li>• Quality often suffers</li> <li>• Owner must be experienced</li> <li>• Potential loss of checks and balances</li> <li>• Process is not clear as DBB</li> </ul>
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### 3. High Performance Requirements

The US Environmental Protection Agency defines high performance buildings (also known as green or sustainable buildings) as: buildings designed and constructed using processes that are environmentally responsible and resource efficient throughout the life-cycle of the building, from inception all the way through operation, maintenance and deconstruction. Several states enforced, recommended or offered incentives for abiding by high performance criteria or certification such as USGBC LEED for state funded projects. Examples of such states are Washington, Colorado, Arizona, Hawaii, Illinois, Ohio, District of Columbia, Florida, Maryland, New Jersey, Connecticut, Rhode Island, and Massachusetts. Reporting on the effect of implementing such standards on the construction costs of a project vary by type of project and by location. Washington State school districts reported an increase of construction costs by \$8.52/SF a net added cost percent ranging from 0.7% to 7.2% with an average of 2.6%. In addition to state incentives, utility companies also offer incentives and rebates for installing equipment that reduce energy requirements. Four school district projects reported \$482,000 in rebates from utility companies. (JLARC Preliminary Report: High Performance Public Buildings: Impact on Energy Use is Mixed). However, it is argued that the energy savings over the lifecycle of the building are greater than the increase in construction cost. Reporting on energy usage is mixed, but in most cases high performance buildings reduce energy usage; Figure 1 shows an example of reduced energy usage.



**Figure 1: Energy Use Reduction in Washington State Schools**

### Other Factors

A number of other factors affect the costs of school construction such as, general construction market conditions, which affects the costs of both labor and materials. The standards and regulations required in each state, such as high performance requirements, delivery methods, absence of delay clauses, classroom sizes, approval processes, etc. Out of all states, New Jersey and California school districts are subject to the highest level of state regulations, where New Jersey has six and California has four agencies claiming jurisdiction over school construction and improvement. Both California and New Jersey review design documents for all projects, while other states either do not review or review designs upon request only such as Florida (Vincent and Mckoy 2008).

There is no standard method of reporting on construction costs of schools, thus comparing school construction costs is not entirely adequate. In the case where costs of school construction costs are reported by different districts, public agencies, or industry databases, the cost division is unclear; it is unclear whether the cost is at time of bid, or at construction completion, whether it includes change orders, hard costs, and soft costs, as well as other variables that form a basis for a valid comparison across different states. The data presented in the figures below could be used as a basis for comparison but it does not accurately represent each state, but rather gives an overall picture of school construction costs.

School construction spending in 2011 in '000		Value of Construction by Type			% of Total Devoted by Type of School				
		New Schools	Additions	Renovations	Elementary	Middle	High	Total	% of Nation
Region 1	CT, ME, MA, NH, RI, VT	\$ 330,890	\$ 131,418	\$ 253,012	\$ 270,391	\$ 113,021	\$ 331,908	\$ 715,320	5.84%
Region 2	NJ, NY, PA	\$ 429,700	\$ 275,809	\$ 290,268	\$ 547,677	\$ 105,552	\$ 341,552	\$ 995,777	8.13%
Region 3	DC, DE, MD, VA, WV	\$ 650,302	\$ 132,350	\$ 160,132	\$ 315,833	\$ 337,517	\$ 280,007	\$ 942,784	7.70%
Region 4	KY, NC, SC, TN	\$ 609,254	\$ 141,647	\$ 264,453	\$ 334,051	\$ 255,869	\$ 406,142	\$ 1,015,354	8.29%
Region 5	AL, FL, GA, MS	\$ 973,613	\$ 315,142	\$ 156,736	\$ 338,245	\$ 322,344	\$ 779,120	\$ 1,445,491	11.81%
Region 6	IN, OH, MI	\$ 421,890	\$ 164,126	\$ 274,551	\$ 251,286	\$ 228,911	\$ 352,832	\$ 860,567	7.03%
Region 7	IL, MN, WI	\$ 204,996	\$ 170,882	\$ 194,563	\$ 160,294	\$ 70,164	\$ 339,983	\$ 570,441	4.66%
Region 8	IA, KS, MO, NE	\$ 273,497	\$ 164,030	\$ 101,628	\$ 166,060	\$ 57,150	\$ 315,406	\$ 539,155	4.40%
Region 9	AR, LA, OK, TX	\$ 1,272,466	\$ 377,919	\$ 397,174	\$ 782,168	\$ 518,032	\$ 698,218	\$ 2,047,559	16.73%
Region 10	CO, MT, ND, NM, SD, UT, WY	\$ 267,414	\$ 106,640	\$ 125,163	\$ 196,192	\$ 87,363	\$ 202,682	\$ 499,217	4.08%
Region 11	AZ, CA, HI, NV	\$ 1,171,244	\$ 557,812	\$ 237,373	\$ 442,447	\$ 373,622	\$ 1,148,395	\$ 1,966,429	16.06%
Region 12	AK, ID, OR, WA	\$ 295,505	\$ 149,307	\$ 198,199	\$ 227,626	\$ 198,047	\$ 217,338	\$ 643,011	5.25%
		\$ 6,900,771	\$ 2,687,082	\$ 2,653,252	\$ 4,032,269	\$ 2,667,593	\$ 5,413,581	\$ 12,241,105	

Figure 2: 2012 Annual School Construction Report. School Planning & Management

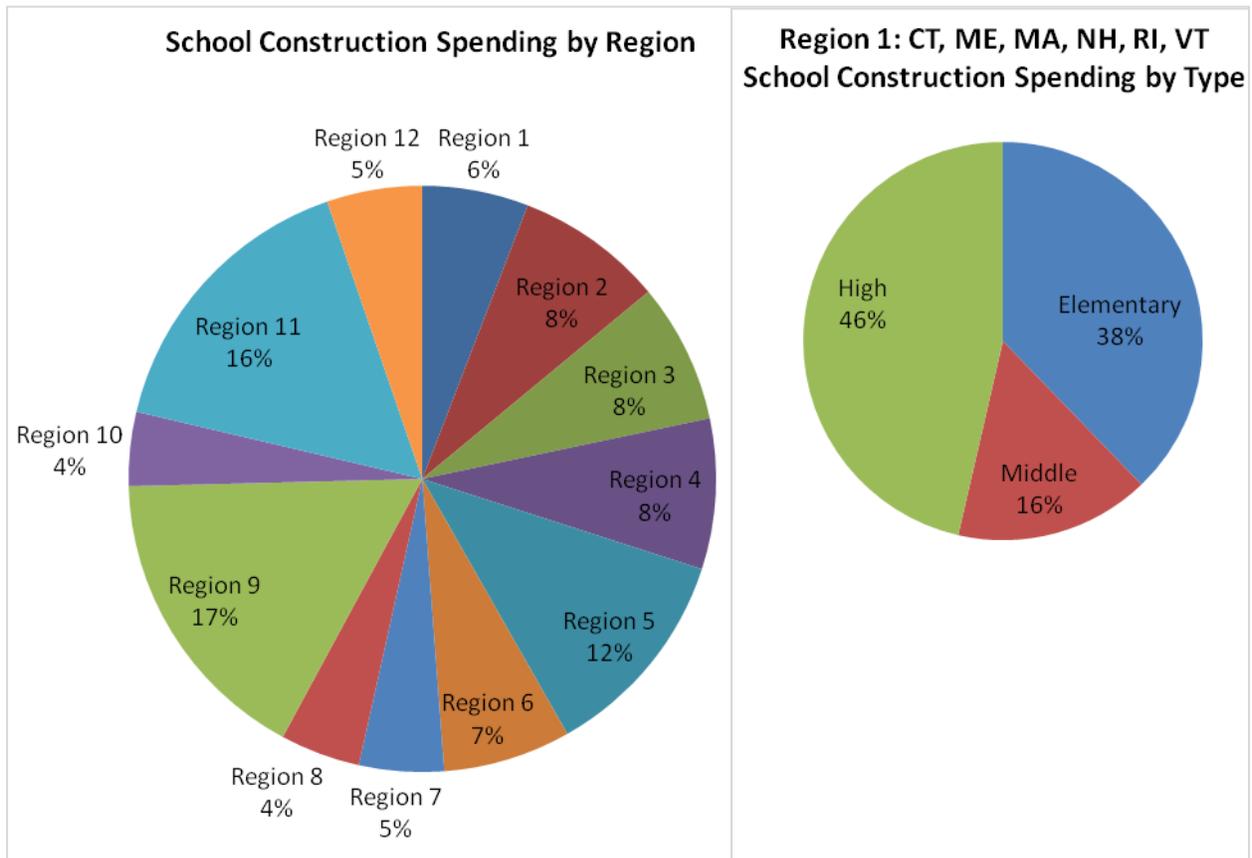


Figure 3: 2012 Annual School Construction Report. School Planning & Management

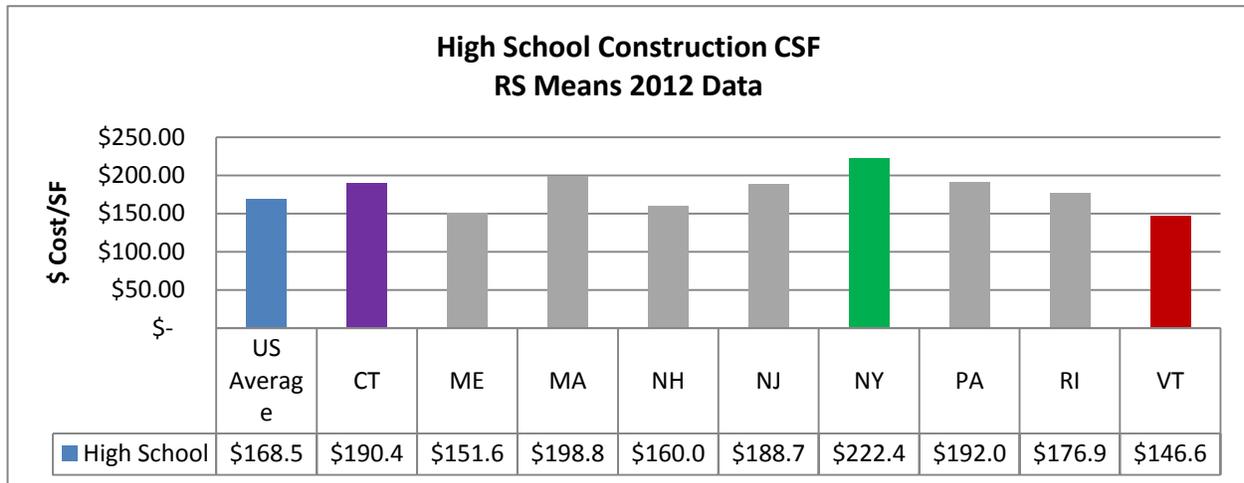


Figure 4: 2012 RS Means Data, based on highest city location factor

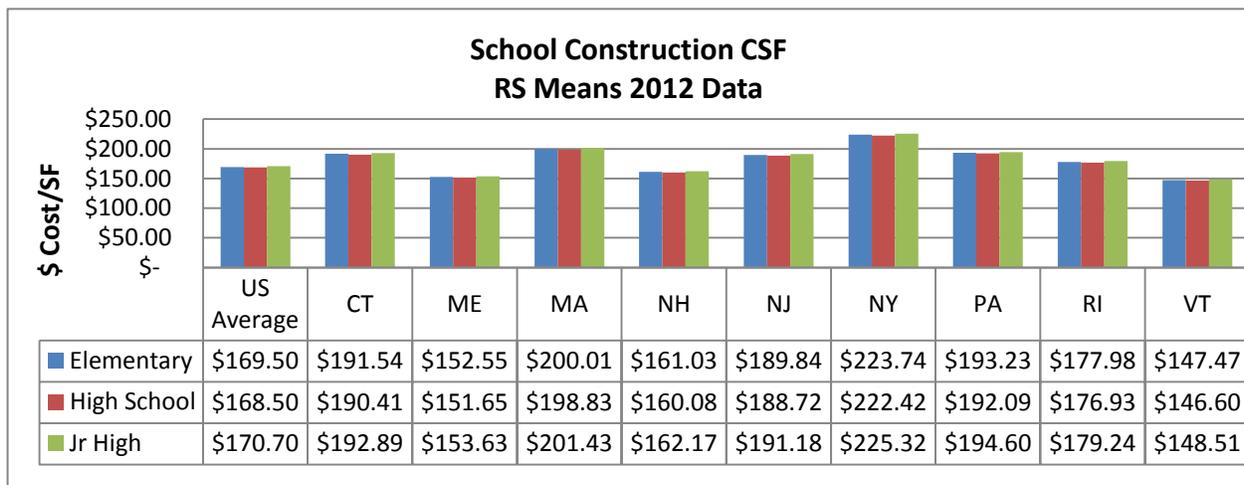


Figure 5: 2012 RS Means Data, based on highest city location factor

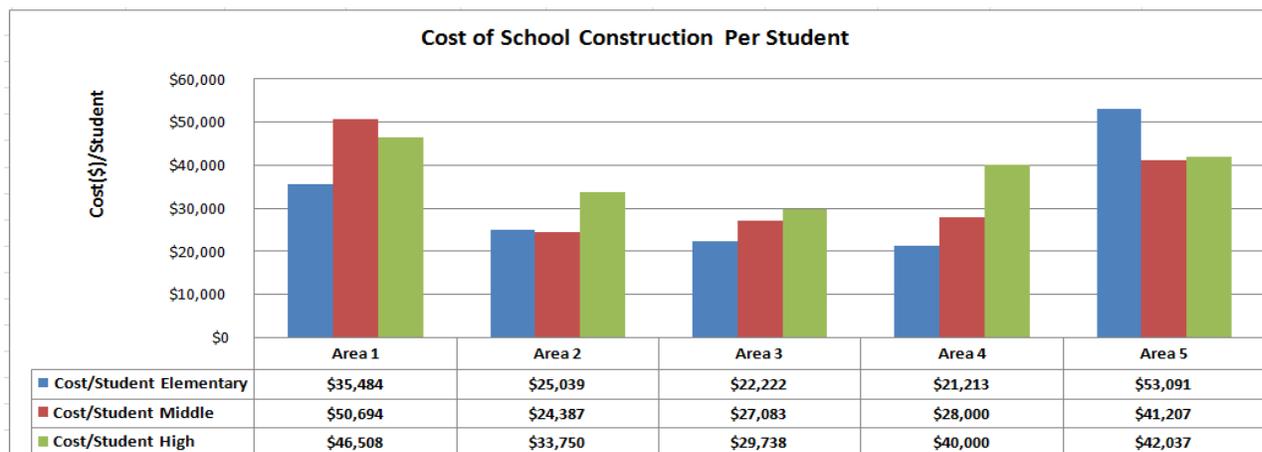


Figure 6: 2012 Annual School Construction Report. School Planning & Management

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