

# Cost of Public Construction Projects in Connecticut and Selected Other States

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## Issue

Compare the cost of public construction projects in Connecticut with those in Massachusetts, New Jersey, and New York.

## Summary

To research this issue, we sought information about three types of projects: (1) school construction projects, (2) state public works projects generally, and (3) transportation projects. This report discusses our findings for each of these project types. Additionally, it summarizes key findings from secondary sources we reviewed, as well as observations we received from the Connecticut Construction Industries Association (CCIA) and some of its member contractors.

Our approach to researching this issue consisted of contacting (1) Connecticut's Department of Administrative Services (DAS) and Department of Transportation (DOT), and their counterpart agencies in the three other states; (2) *School Planning and Management*, a magazine that covers, among other topics, current issues in school construction; and (3) CCIA. Additionally, we conducted an extensive review of secondary sources concerning the costs of public construction projects. Data sources are noted in the report where applicable. Generally the data were provided (1) directly by the responding agencies or (2) in reports published by the agencies or outside entities.

Generally, for the reasons described in the report, we were unable to obtain primary data or secondary research that allowed us to directly compare Connecticut project costs with the costs in other states. Principally, these reasons include (1) the high number of variables that affect project

costs (e.g., materials costs and site topography) and (2) a lack of standardization in how states calculate project costs. However, we were able to obtain federal government data on bridge replacement unit costs, making cost comparisons across the four states for this type of transportation project feasible.

## School Construction

### *Response from DAS*

DAS, through its Office of School Construction Grants Review, administers the state’s school building projects grant program, which awards grants to municipalities for school construction and renovations ([CGS § 10-282 et seq](#)). DAS reported that it uses a \$360 per square foot estimate for school construction costs, plus soft costs. It estimates soft costs at 17% of construction costs for a renovation and at 15% for new construction. According to DAS, examples of soft costs include construction management, legal fees, site preparation and development costs, equipment and furnishing costs specific to the construction, and professional fees for financial consultants.

### *2014 Report by School Building Projects Advisory Council*

A 2014 report by the School Building Projects Advisory Council examines Connecticut’s school construction process and includes some procedural comparisons with Massachusetts, New York, and New Jersey. For example, the report notes that Connecticut, unlike the other three states, neither procures nor oversees procurements for design and construction services for local school districts.

With respect to costs, the report notes that school construction costs in Connecticut increased significantly from 2000 to 2012. Table 1 below shows the cost (in current dollars) for new school construction (1998 to 2013) and renovations (1998 to 2011), as well as the number of projects in each year.

**Table 1: Cost per Square Foot of Connecticut School Construction Projects**

Year	New Construction		Renovations	
	Cost per Square Foot	Number of Projects	Cost per Square Foot	Number of Projects
1998	\$284.60	3	\$117.52	6
1999	204.32	6	162.75	6
2000	230.08	7	187.55	6
2001	232.75	8	196.65	4

Table 1 (continued)

Year	New Construction		Renovations	
	Cost per Square Foot	Number of Projects	Cost per Square Foot	Number of Projects
2002	295.21	7	184.22	15
2003	294.31	5	192.31	8
2004	297.92	9	260.53	5
2005	360.11	8	202.28	8
2006	427.52	13	284.22	3
2007	418.97	4	70.55	2
2008	402.52	11	340.03	4
2009	433.95	6	276.62	5
2010	474.28	4	359.48	3
2011	440.66	4	258.54	1
2012	495.54	2	N/A	N/A
2013	457.56	12	N/A	N/A

Source: School Building Projects Advisory Council (February 2014)

The report, which does not provide any cost data from the other states, notes that there is no standard method for reporting on school construction costs. For example, it states that when comparing costs in different states, “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 report is available [here](#).

### ***Outreach to Other States***

We contacted the Massachusetts School Building Authority (MSBA), New Jersey Schools Development Authority (SDA), and the New York State Department of Education’s (NYSED) Office of Facilities Planning.

***Massachusetts.*** MSBA provided us with historical data on the per square foot reimbursement rates that it pays to school districts, as shown in Table 2. (The rate has increased by 4.5% in each of the previous four years.) The authority noted that this rate is often lower than the per square foot cost of a particular project, but increasing it to match actual project costs would limit the number of projects it could fund.

**Table 2: MSBA Reimbursement Data**

Fiscal Year	Reimbursement (Per Square Foot)*
09-14	\$275
15	287
16	299
17	312
18	326

Source: MSBA

\*Includes new building plus eligible site costs

**New Jersey.** According to SDA's [biannual reports](#), its average per-square foot cost for constructing new elementary schools was \$301 from October 2016 through March 2017 (two projects), \$270 from April 2016 through September 2016 (one project), and \$267 from October 2015 through March 2016 (one project).

**New York.** NYSED informed us that it does not track per square foot costs for new construction or renovations in a way that would produce meaningful results. For example, its renovation cost data includes the cost of the renovation and the size of the entire building, rather than the size of the area being renovated.

Costs of projects administered by the New York City Construction Authority are tracked by the [New York City's Mayor's Management Report](#). According to the 2016 report, the authority's average new construction price per square foot in FY 16 was \$657 for elementary schools and \$573 for intermediate schools.

### ***School Planning & Management Report***

*School Planning & Management* is a magazine that covers various education-related topics, including school construction. It previously published an annual report that, among other things, compared school construction costs in different regions of the country.

The magazine's final such report, published in February 2015, analyzed construction cost data for 2014. Table 3 below compares school construction costs in New England (Region 1) with those in New Jersey, New York, and Pennsylvania (Region 2).

**Table 3: 2014 New School Construction Costs Per Square Foot**

<i>Region</i>	<i>Elementary</i>	<i>Middle</i>	<i>High</i>
Region 1 (CT, ME, MA, NH, RI, VT)	\$400.36	\$371.59	\$387.75
Region 2 (NJ, NY, PA)	235.36	250.93	333.33

Source: 20<sup>th</sup> Annual School Construction Report, School Planning & Management (February 2015)

We contacted *School Planning & Management* to inquire about whether it had any state-level data available. The magazine referred us to the report’s author, who spoke with us by phone. He did not have any state-level data available, but his general impression was that school construction costs in Connecticut, Massachusetts, New York, and North Jersey were in the “same ballpark,” with the costs in South Jersey being lower. Additionally, he noted that the Region 2 data was influenced by relatively lower costs in Pennsylvania, whereas most of the Region 1 data is from Connecticut and Massachusetts.

## **State Public Works Projects Generally**

### ***Response from DAS***

DAS, through its Division of Construction Services, has charge and supervision of most capital building projects administered by the state. In developing an estimate of a project’s costs, DAS takes into account various factors, including construction type, materials, size, and program complexity. The department noted that it administers a wide range of projects and, thus, cost estimates vary significantly based on the type of project. For example, it may estimate costs of \$150 per square foot for a storage building, but a complex research laboratory may have estimated costs of \$400 per square foot or more.

More information on DAS’s procedures for estimating costs is available in the department’s [Consultants Procedure Manual](#) (see specifically Section 3.5 et seq).

### ***Outreach to Other States***

We contacted the Massachusetts Division of Capital Asset and Management Maintenance, within the Executive Office for Administration and Finance; New Jersey’s Division of Property Management and Construction, within the Department of the Treasury; and the New York Office of General Services. We will update the report if we receive information from these agencies.

# Transportation Projects

## *Response from DOT*

DOT administers state transportation projects. The department reported that it was not aware of any research comparing the costs of rail or transit projects across the four states. With respect to highway and bridge project costs, DOT was aware of only one specific metric for which there was comparative data across the four states: replacement unit costs for structurally deficient bridges.

The data measures the replacement costs for bridges constructed with federal funds; states must report these costs to the Federal Highway Administration (FHWA). They must separately report data for bridges on the National Highway System (NHS) and bridges not on the NHS. (NHS consists of the Interstate Highway System and other roads important to the nation’s economy, defense, and mobility.)

Tables 4 (for NHS bridges) and 5 (for non-NHS bridges) below show replacement unit costs (in current dollars) for structurally deficient bridges. According to FHWA, average unit cost is calculated by dividing the total cost of eligible items by the total deck area of the new replacement bridges. The data includes all replaced highway bridges let or awarded during the applicable fiscal year.

**Table 4: Replacement Unit Costs of Structurally Deficient Bridges: NHS Bridges**

State	2014 Costs Collected in 2015	2015 Costs Collected in 2016	2016 Costs Collected in 2017	Cost Used for 2016 Estimates
Connecticut	\$299	\$375	\$442	\$372
Massachusetts	208	469	440	373
New Jersey	243	419	638	434
New York	206	311	287	268

Source: [FHWA](#)

**Table 5: Replacement Unit Costs of Structurally Deficient Bridges: Non-NHS Bridges**

State	2014 Costs Collected in 2015	2015 Costs Collected in 2016	2016 Costs Collected in 2017	Cost Used for 2016 Estimates
Connecticut	\$702	\$480	\$439	\$541
Massachusetts	383	424	460	423
New Jersey	(not reported)	(not reported)	489	489
New York	220	302	288	270

Source: [FHWA](#)

## ***Outreach to Other States***

We contacted the Massachusetts Department of Transportation, New York State Department of Transportation, and New Jersey Department of Transportation. Below we describe the information we received from New Jersey. We will update this report if we receive information from Massachusetts or New York.

***New Jersey.*** The New Jersey Department of Transportation (NJDOT) provided us with a copy of a [transportation project cost study](#) conducted by Rutgers University's Voorhees Transportation Center and published in May 2016. According to the study, the average cost to plan, construct, operate, and maintain one mile of roadway under NJDOT jurisdiction was \$183,757 between FYs 10 and 14, excluding debt service. When debt service is included, the average per-lane mile cost increases to \$212,927.

The study also found that about 59% of total transportation-related expenditures are for activities not directly associated with planning, constructing, operating, or maintaining roads and bridges under NJDOT's jurisdiction. Among the excluded expenditures are (1) grants and other expenditures related to the NJDOT local aid program and other grants made to local governments; (2) capital project and operating support to NJ TRANSIT; (3) debt service on bonds issued to finance transportation projects; (4) funds passed through to other entities; and (5) expenditures associated with NJDOT's Bureau of Aeronautics, Office of Maritime Resources, and activities related to rail freight planning.

## **Other Research**

In addition to the outreach described above, we also (1) conducted an extensive review of secondary sources concerning the costs of public construction projects and (2) contacted CCIA. Findings from each of these approaches are described separately below.

### ***Review of Secondary Sources***

Much of the research we found describes the challenges with producing direct cost comparisons across states, even for the same type of project. With respect to paving, for example, a number of factors affect the cost, including differences in urban versus rural job sites, differences in soil and topography, possible labor or materials cost differences, and traffic volume differences, among others.

Below we describe a selection of this research for school construction projects, transportation projects, and correctional facilities.

**School Construction.** In 2016 Montgomery County’s (MD) Office of Legislative Oversight issued a [report](#) examining local elementary school construction costs in Maryland and detailing the various factors that comprise these costs. Table 6 lists factors identified in the report as influencing school construction costs:

**Table 6: Factors Influencing School Construction Costs**

<b>Factor</b>	<b>Examples</b>
Procurement policies and practices	<ul style="list-style-type: none"> <li>• Prevailing wage and set-aside requirements</li> <li>• Project delivery methods</li> <li>• Use of add-alternates (additional work items that may be added to a project if bids are received below the budgeted amount)</li> </ul>
Site costs and stormwater management regulations	<ul style="list-style-type: none"> <li>• Geographic location</li> <li>• Site conditions (e.g., soil condition and utilities)</li> <li>• Environment</li> <li>• Stormwater management regulations</li> </ul>
High performance building mandates	<ul style="list-style-type: none"> <li>• Requiring LEED (Leadership in Energy and Environmental Design) certification</li> </ul>
School design practices	<ul style="list-style-type: none"> <li>• Educational specifications</li> <li>• Building size</li> <li>• Level of community involvement in the design process</li> <li>• Use of school buildings for non-educational programs</li> <li>• Use of prototype school designs</li> </ul>
Market conditions	<ul style="list-style-type: none"> <li>• Labor and materials costs</li> </ul>

Source: Montgomery County (MD) Office of Legislative Oversight

**Transportation Projects.** In a [2014 report](#), the Washington State Joint Transportation Committee analyzed cost drivers and efficiency initiatives in Washington transportation projects. Among things, the report examines whether the state’s transportation project costs differed from those in other states (see pp. 26-33 of the report).

The report describes the challenges associated with making these comparisons. It notes that several factors that affect project costs, including labor, materials, and the construction sector’s competitive environment, are beyond the control of the contracting agency. It also notes that project-level comparisons are difficult to make because comparable projects are “nearly impossible to find.”

According to the report, it can also be challenging to compare project costs within the same state: “Even comparing project costs within [Washington]’s program results in a wide range of overall costs and cost per lane mile as a result of the specific characteristics of individual projects, such as soil conditions, mitigation requirements, need for new right of way, connection to existing highway system, topography and slopes, and drainage requirements.”

***Correctional Facility Construction.*** In March 2013, the consulting firm MGT of America submitted a [report](#) to the State of New Hampshire concerning the cost of constructing a new correctional facility. Among other things, the report examined benchmarks for correctional facility construction costs (see pp. 15-16 of the report).

MGT reported that it found limited available data for correction facility construction costs since 2000. It also noted that average construction cost per bed can vary widely even among facilities that house the same classification of offenders. For example, MGT found that the cost per bed of a maximum security state facility constructed in Illinois in 2003 was roughly \$97,000, while the cost per bed of a federal maximum security facility constructed in Kentucky in 2002 was roughly \$248,000.

### ***Outreach to CCIA***

CCIA is a member organization that represents various segments of Connecticut’s construction industry. Because some members work in neighboring states, we contacted the association and asked whether (1) it had any comparative cost data for Connecticut and the three other states or (2) the association or any of its members had any observations, even if anecdotal, of any project cost similarities or differences across the four states.

We spoke with CCIA’s president, who also forwarded our inquiry to selected CCIA members. We received responses from three of these members (one by phone and two by email).

Neither CCIA nor its members had any data comparing project costs in Connecticut with costs in the three other states. Collectively, the respondents offered several observations, as shown in Table 7.

**Table 7: Observations Provided by CCIA and its Members**

<b>Category</b>	<b>Response</b>
Labor	Multiple respondents reported that labor rates in Connecticut are slightly lower than those in Boston, Rhode Island, central Massachusetts, New York City, and Albany  One respondent reported that (1) labor unions in Connecticut are more flexible than those in Massachusetts and (2) work rules in Connecticut are less restrictive than those in Massachusetts
Materials	One respondent reported that materials prices are generally higher in Connecticut than they are in Massachusetts and Rhode Island; a different respondent reported that materials costs in Connecticut are roughly equivalent to the Boston area
Miscellaneous costs	One respondent reported that costs of workers comp, insurance, and subcontractor quotes are roughly equivalent to the Boston area
Equipment tax	One respondent reported that Connecticut's equipment tax must be taken into account and causes confusion among contractors
Bonding	One respondent noted that Connecticut's nonresident contractor bond requirement ( <a href="#">CGS §12-430(7)</a> ) can increase costs (Massachusetts has a similar requirement)
Cost estimates	Multiple respondents reported that (1) estimating project costs is not straightforward: factors include labor, materials, equipment, and subcontractors and (2) these costs may vary even within the same state
Contracting agency	Multiple respondents reported that past experience with the contracting agency can also affect a bidder's pricing: if an agency has a track record of administering projects in a fair and efficient manner, it is usually able to obtain more favorable pricing from bidders (because the bidders can price a lower amount of risk into their bids)

## **Additional Resources**

Connecticut Department of Administrative Services: [Consultants Procedure Manual](#). September 2016.

Connecticut School Building Projects Advisory Council: [Report](#). February 2014.

Federal Highway Administration: [Bridge Replacement Unit Costs 2016](#). June 2017.

Montgomery County (MD) Office of Legislative Oversight: [New School Construction Costs](#). November 2016.

New Hampshire Department of Administrative Services and Department of Corrections: [Final Report: Correctional Facilities RFP Evaluations](#). March 2013.

Rutgers University, Alan M. Voorhees Transportation Center: [The Cost of Roadway Construction, Operations and Maintenance in New Jersey](#). May 2016.

Washington State Joint Transportation Committee: [Efficiencies in the Construction and Operation of State Transportation Projects](#). January 2014.

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