

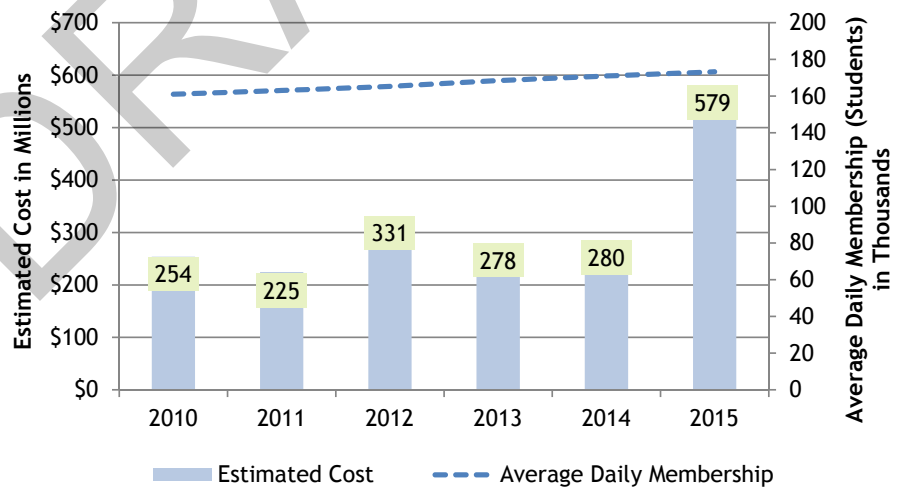
Enrollment growth and the rising cost of construction materials appear to be driving the increase in Education needs.

School systems must comply with the Tennessee Constitution’s guarantee of the right of access to public education,⁹ as well as with the Tennessee Education Improvement Act of 1992,¹⁰ which places limits on the number of students in classrooms. School systems with growing enrollment are faced with the challenge of providing enough space for students while costs increase. Other school systems need to renovate or replace their schools because of age, condition, or other situations like consolidation or school restructuring.

To meet the needs caused by enrollment growth and aging facilities, school systems can build new schools with extra capacity; build additions onto existing schools; renovate existing spaces; or use portable classrooms. In this inventory, the \$488 million (34.5%) increase in the need for new schools was the main reason the total estimated cost for education infrastructure increased. This year, local officials reported they need \$1.9 billion to build new schools, of which \$639 million is for school projects reported for the first time by fourteen school systems.¹¹

Almost half of all school systems reporting a need for new schools have growing enrollments (see table 2 on the next page). Of the fourteen systems with newly reported needs for a new school, six—Lakeland and the counties of Hamblen, Knox, Rutherford, Sumner and Williamson—reported needing an additional school, instead of a replacement school where the old building is either demolished or repurposed (see figure 2). Five of these six also experienced enrollment growth from 2010 to 2015. The lone exception is the new Lakeland School System in Shelby County—they only have an elementary school at this time and need to build a middle school so the students can stay inside the school district.

Figure 2. Total Estimated Cost and Student Enrollment for the Six School Systems Needing New Schools July 2010 through 2015 Inventories



⁹ Article XI, Section 12, Constitution of the State of Tennessee.

¹⁰ <http://comptroller.tn.gov/repository/RE/educimproveact.pdf>.

¹¹ Bradley County, Bristol, Collierville, Davidson County, Hamblen County, Hamilton County, Knox County, Lakeland, Marion County, Rutherford County, Shelby County, Sumner County, Washington County, and Williamson County

**Table 2. Change in Student Enrollment 2010 to 2015
for School Systems that Need New Schools**

Five-year Period July 2015 through June 2020

School System	Change in Student Enrollment 2010 to 2015	Estimated Cost of New Schools July 2015	
		Total	Per Student
Davidson County	7,554	\$ 211,181,000	\$2,607
Williamson County	4,474	269,500,000	\$7,702
Rutherford County	4,186	154,110,000	\$3,720
Montgomery County	2,723	86,822,362	\$2,766
Knox County	2,058	58,295,000	\$1,012
Hamilton County	1,992	79,000,000	\$1,851
Wilson County	1,708	198,000,000	\$11,810
Sumner County	1,314	69,074,167	\$2,437
Bedford County	574	36,475,000	\$4,376
Cleveland	474	14,000,000	\$2,654
Johnson City	419	14,000,000	\$1,811
Maury County	323	45,000,000	\$3,838
Putnam County	272	26,500,000	\$2,475
Robertson County	234	47,800,000	\$4,290
Hamblen County	233	10,000,000	\$995
Bristol	137	52,000,000	\$13,033
DeKalb County	76	42,000,000	\$14,636
Pickett County	58	15,000,000	\$20,272
Lakeland	(27)	17,678,000	\$20,934
Van Buren County	(30)	500,000	\$687
Sevier County	(38)	52,600,000	\$3,690
Macon County	(44)	10,000,000	\$2,718
Oak Ridge	(56)	10,500,000	\$2,385
Collierville	(78)	95,000,000	\$12,097
Bradley County	(85)	16,000,000	\$1,602
Dickson County	(128)	21,000,000	\$2,550
Marion County	(198)	19,444,110	\$4,769
Benton County	(214)	200,000	\$93
Fentress County	(218)	12,000,000	\$5,638
Cumberland County	(230)	12,000,000	\$1,678
Claiborne County	(265)	1,800,000	\$411
Overton County	(303)	40,000,000	\$12,713
Millington	(323)	6,659,000	\$2,510
Washington County	(501)	70,000,000	\$8,076
Cheatham County	(515)	30,000,000	\$4,741
Roane County	(585)	50,000,000	\$7,454
Shelby County	(5,923)	11,579,999	\$99
Total	19,046	\$ 1,905,718,638	\$9,667

Table 3. Estimated Cost of School Infrastructure Improvements by Type of Need
July 2014 Inventory vs. July 2015 Inventory

Type of Infrastructure	July 2014 Inventory	July 2015 Inventory	Difference	Percent Change
New School Space	\$ 1,798,560,356	\$ 2,434,983,127	\$ 636,422,771	35.4%
New Schools Additions	1,417,287,362	1,905,718,638	488,431,276	34.5%
	381,272,994	529,264,489	147,991,495	38.8%
Improvements to Existing Schools	\$ 1,965,093,834	\$ 2,220,673,623	\$ 255,579,789	13.0%
Renovations	1,745,145,342	1,979,735,886	234,590,544	13.4%
Technology*	111,151,588	140,609,469	29,457,881	26.5%
Mandates	108,796,904	100,328,268	(8,468,636)	-7.8%
System-wide Needs	\$ 15,707,000	\$ 28,942,000	\$ 13,235,000	84.3%
Statewide Total	\$ 3,779,361,190	\$ 4,684,598,750	\$ 905,237,560	24.0%

*Technology includes school projects with estimated costs below the \$50,000 threshold used for other types of infrastructure included in the inventory. Individual technology projects under the threshold totaled \$3,341,937 in 2015 and \$3,521,536 in 2014.

The total estimated cost for school additions increased \$148 million (38.8%) and now totals \$529 million, while the cost for improvements to existing space increased \$256 million (13.0%) and totals \$2.2 billion (see table 3). Some of the additions and improvements to existing space are caused by the condition of the school. Although just over 8.1% of public schools (142) in Tennessee were rated by their local school officials in fair or poor condition, 135 of those schools need improvements to existing space and account for 31.5% of total estimated existing space needs (see figure 3, table 4, and appendix E).

Another reason for the increase in the cost of needed education infrastructure could be the rising cost of construction materials and labor. The US Bureau of Labor Statistics' new school construction price index rose 18 points (13.8%) from 2010 to 2015,¹² and RSMMeans data by Gordian, an industry-leading construction cost estimating company, shows growth in square foot costs for schools increasing similarly.¹³ In 2010, the average cost of a completed new school was \$16 million in Tennessee. Six schools were completed since last year's report for a total cost of \$124 million, averaging \$21 million per school. Over the next five years, local officials report needing 77 more schools at an average of \$25 million.

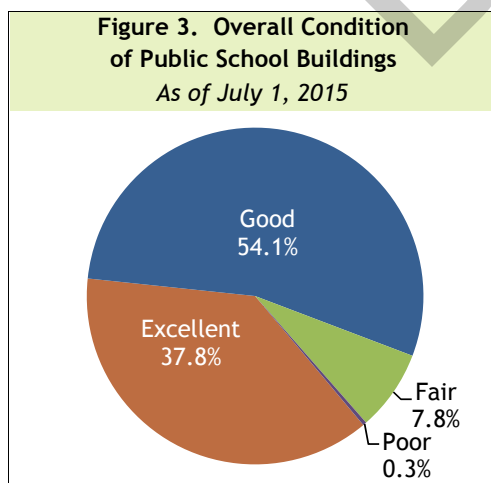


Table 4. Renovation Costs by School Condition
Five-year Period July 2015 through June 2020

School Condition	Number of Schools	Estimated Cost to Renovate	Average Cost Per School
Good or Excellent	862	\$ 1,352,782,586	\$ 1,569,353
Fair or Poor	135	623,253,300	4,616,691
Total	997	\$ 1,976,035,886	\$ 1,981,982

Note: Does not include facility upgrades captured in the school system-wide category used for the total renovation cost in Table 3.

¹² US Bureau of Labor Statistics - <https://data.bls.gov/timeseries/PCU236222236222>.

¹³ RSMMeans data by Gordian, [Square Foot Costs With RSMMeans Data 2017](#).

Water means business. Millions of households, businesses, and industries depend on reliable water systems to function every day. At the same time, 30 of the country's largest water utilities support up to \$52 billion in economic output and 289,000 jobs annually.

Lynn E. Broaddus & Joseph Kane, Brookings, *Amidst Federal Uncertainty, Five Steps to Drive Future Water Innovation at the Regional Level*, March 14, 2017

The need for clean water and housing account for most of the increase in the Health, Safety, and Welfare category.

Tennessee's water and wastewater infrastructure is aging—some water and sewer mains are now over a century old¹⁴—and as the state's population grows—especially around our major cities of Memphis, Nashville, Knoxville, and Chattanooga—additional capacity is needed. In this year's inventory, the estimated cost of needed water and wastewater infrastructure increased \$1 billion (32.6%) and now totals \$4.3 billion. This increase is mainly caused by the addition of large projects in Shelby and Knox counties. Memphis finalized plans for \$250 million to rehabilitate their sewer system to comply with a 2012 US Environment Protection Agency consent decree to ensure clean water for their citizens.¹⁵ In addition, Shelby County needs \$118 million to expand their south water treatment plant. Knox County needs \$233 million to replace wastewater mains and another \$83 million for water main improvements, but this just covers the pipes. Knox County also needs \$66 million to make improvements to their Kuwahee Wastewater Treatment Plant.

The other primary cause of the increase in Health, Safety, and Welfare needs in this year's inventory is a large increase in the estimated cost of housing infrastructure. An improved survey approach identified needs for public housing infrastructure not captured in past reports. Last year's report only had three projects, and all of those have since been completed. This year, 49 housing projects are newly identified in the inventory, and the estimated cost totals \$304 million. The largest project is the \$167 million South City housing project in Memphis. The average cost for the other 48 projects is \$2.9 million.

The cost of infrastructure continues to increase for projects that support recreation and cultural assets, public buildings, and efforts to develop the economy.

The estimated cost for needed recreational infrastructure increased \$192 million (19.6%) and now totals \$1.2 billion. Recreation comes in many forms. For some, it can be a ballpark, while others prefer a walk down a trail. Two of the largest projects in the state causing this big increase represent both ends of this spectrum. The cost of the Clarksville Regional Athletic Complex increased to \$88 million while a \$21 million Great Smoky Mountain Greenway Trail has been added to the inventory.

In Davidson County, the state and the city came to an agreement about the site of the new state museum, currently under construction just north of the Nashville Farmers' market. As with some projects in the inventory, when a project moves past the conceptual stage and engineering or constructing

¹⁴ <http://www.npr.org/templates/story/story.php?storyId=91041009>.

¹⁵ <https://www.justice.gov/opa/pr/us-and-tennessee-announce-clean-water-act-agreement-city-memphis>.

the project starts, the estimated cost can change. In this case, the cost has increased from \$126 million to \$160 million thus increasing the overall total for Libraries, Museums, and Historic Sites by \$43 million (12.7%) to a total of \$383 million. The estimated cost for community development infrastructure decreased \$16 million (7.3%) and now totals \$201 million.

The estimated cost of needed infrastructure for public buildings increased \$134 million (30.0%) and totals \$581 million after decreasing last year. The cost for infrastructure needed for other facilities—structures that are publicly-owned but not typically open to the public like salt bins and maintenance facilities—increased \$48 million (51.1%) to a total of \$141 million.

Lastly, the estimated cost of infrastructure supporting business districts increased \$38 million (30.5%) to a new total of \$163 million. This was offset slightly by a \$7 million (2.7%) decrease in the estimated cost for needed infrastructure at industrial sites and parks.

Nearly two-thirds of the estimated cost of the needed improvements reported in this year’s inventory is not funded.

Information about funding for public infrastructure needs reported by officials indicates that 64.6% of the funds required to meet those needs was not available at the time the inventory was conducted, nearly the same as last year’s 65.3%. Excluding improvements needed at existing schools and those drawn from capital budget requests submitted by state agencies, neither of which includes funding information, only \$12.5 billion in funding is available for the remaining \$33.9 billion in needs (see table 5). As always, more of the funding needed will become available as projects move from the conceptual stage to the planning and design stage, but a lack of funding will prevent some projects from ever being completed. In fact, most of the infrastructure needs reported in the July 2010 inventory that were not already fully funded were still needed five years later. As in prior years, funding for needs reported in the inventory comes from federal, state, and local sources.

Table 5. Public Infrastructure Needs Summary of Funding Availability*
Five-year Period July 2015 through June 2020

	Funding Available [in billions]	Funding Needed [in billions]	Total Needed [in billions]
Fully Funded Improvements	\$ 12.0	\$ 0.0	\$ 12.0
Partially Funded Improvements	0.5	5.7	6.2
Unfunded Improvements	0.0	15.7	15.7
Total	\$ 12.5	\$ 21.4	\$ 33.9

*Excludes infrastructure improvements for which funding availability is not known.

Note: Totals may not equal 100% because of rounding.

The government that owns infrastructure typically funds the bulk of its cost, and a variety of revenue sources are tapped. For example, the state collects taxes and appropriates those funds to its own projects but also provides grants to local governments through programs in various state agencies. Even so, cities and counties fund most of their infrastructure improvements with their own property and sales tax revenues, while utility districts fund their improvements primarily with dedicated revenue sources in the form of user fees.

Because most of the state's infrastructure needs are not included in this analysis, local government sources—mainly counties and cities—provide the majority of funding for all fully funded needs presented here except for transportation, which is funded primarily by the federal and state governments, and public health facilities and community development, both of which are funded primarily by the federal government (see table 6). It may appear that the state does not help pay for school buildings even though it does—although counties report funding 100% of new public school construction, the state provides an equivalent amount through its Basic Education Program (BEP) funding formula. The formula includes funds for capital outlay, an amount that topped \$700 million for fiscal year 2015-16.¹⁶ The state pays more than half of that amount but does not earmark those funds for that specific purpose, therefore school systems have the flexibility to use those funds to meet various school needs and for various reasons generally report using them for operating costs rather than capital outlay. Counties also report funding all of the reported \$2 million in school system-wide needs.

¹⁶ Tennessee Department of Education, 2014. "Capital" worksheet in "FY16 July Final.xlsm" workbook.

Table 6. Funding Source by Category and Type of Infrastructure for Fully Funded Improvement Needs [in millions]
Five-year Period July 2015 through June 2020

Category and Project Type	State		Federal		Other		City		County		Special District		Total
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount
Transportation and Utilities	\$ 3,315.7	41.9%	\$ 3,774.4	47.7%	\$ 24.5	0.3%	\$ 572.2	7.2%	\$ 209.2	2.6%	\$ 15.2	0.2%	\$ 7,911.3
Transportation	3,314.0	43.0%	3,772.9	49.0%	24.0	0.3%	376.9	4.9%	206.9	2.7%	11.3	0.1%	7,706.1
Other Utilities	1.7	0.8%	1.5	0.7%	0.5	0.2%	195.3	95.2%	2.3	1.1%	3.9	1.9%	205.2
Health, Safety and Welfare	\$ 32.6	1.2%	\$ 145.8	5.2%	\$ 37.3	1.3%	\$ 1,364.0	48.3%	\$ 1,055.1	37.4%	\$ 189.6	6.7%	\$ 2,824.3
Water and Wastewater	31.9	1.2%	120.0	4.6%	36.8	1.4%	1,308.5	50.1%	923.8	35.4%	189.6	7.3%	2,610.5
Law Enforcement	0.0	0.0%	2.0	1.7%	0.0	0.0%	2.4	2.0%	113.6	96.2%	0.0	0.0%	118.1
Storm Water	0.0	0.2%	7.1	35.4%	0.5	2.5%	11.5	57.7%	0.8	4.0%	0.0	0.2%	20.0
Fire Protection	0.2	0.5%	1.8	6.0%	0.0	0.0%	17.9	60.0%	10.0	33.5%	0.0	0.0%	29.9
Public Health Facilities	0.0	0.7%	1.8	39.6%	0.0	0.0%	0.0	0.0%	2.7	59.7%	0.0	0.0%	4.4
Solid Waste	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.7	24.5%	2.1	75.5%	0.0	0.0%	2.7
Housing	0.5	1.3%	13.2	34.0%	0.0	0.0%	23.0	59.4%	2.1	5.4%	0.0	0.0%	38.7
Education	\$ 0.0	0.0%	\$ 0.0	0.0%	\$ 0.0	0.0%	\$ 0.0	0.0%	\$ 419.5	100.0%	\$ 0.0	0.0%	\$ 419.5
New Public Schools	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	417.3	100.0%	0.0	0.0%	417.3
School-System-wide	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	2.2	100.0%	0.0	0.0%	2.2
Recreation and Culture	\$ 18.1	3.4%	\$ 133.7	24.9%	\$ 31.5	5.9%	\$ 139.4	26.0%	\$ 213.3	39.8%	\$ 0.4	0.1%	\$ 536.4
Recreation	12.1	2.6%	105.9	22.9%	20.4	4.4%	112.4	24.3%	210.8	45.6%	0.4	0.1%	462.0
Community Development	4.9	13.9%	17.9	51.0%	0.1	0.2%	10.7	30.5%	1.6	4.4%	0.0	0.0%	35.2
Libraries, Museums, and Historic Sites	1.1	2.8%	9.9	25.2%	11.0	28.1%	16.3	41.5%	0.9	2.4%	0.0	0.0%	39.2
Economic Development	\$ 6.8	3.6%	\$ 13.9	7.3%	\$ 4.4	2.3%	\$ 82.8	43.4%	\$ 44.2	23.2%	\$ 38.6	20.2%	\$ 190.7
Business District Development	3.1	2.4%	0.8	0.6%	2.6	2.0%	67.9	53.3%	17.4	13.6%	35.8	28.1%	127.6
Industrial Sites and Parks	3.7	5.9%	13.0	20.7%	1.9	2.9%	14.9	23.5%	26.8	42.5%	2.8	4.4%	63.1
General Government	\$ 0.4	0.3%	\$ 2.5	1.8%	\$ 0.2	0.1%	\$ 107.8	78.8%	\$ 12.0	8.8%	\$ 14.0	10.2%	\$ 136.9
Public Buildings	0.0	0.0%	1.6	1.9%	0.2	0.2%	71.9	87.2%	8.8	10.7%	0.0	0.0%	82.5
Other Facilities	0.4	0.6%	0.9	1.7%	0.0	0.0%	35.9	66.1%	3.2	5.9%	14.0	25.8%	54.4
Grand Total	\$ 3,373.6	28.1%	\$ 4,070.3	33.9%	\$ 97.9	0.8%	\$ 2,266.2	18.9%	\$ 1,953.2	16.3%	\$ 257.8	2.1%	\$ 12,019.0

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