

Building Tennessee's Tomorrow:

Anticipating the State's Infrastructure Needs

July 2012 through June 2017

SCHOOL INFRASTRUCTURE NEEDS

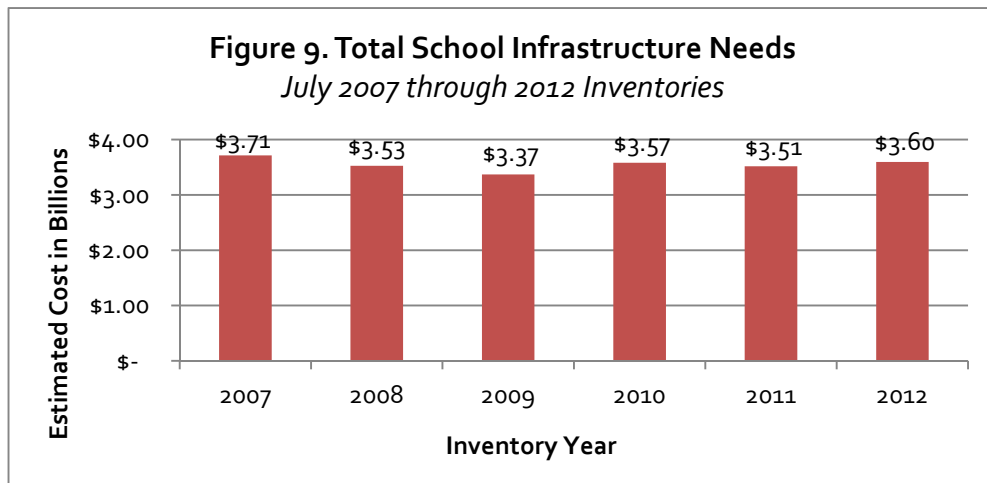
Estimated Cost of Public School Building Improvements Remains Steady.

Tennessee's 136 public school systems need \$3.6 billion for infrastructure improvements that are forecast to be in some stage of development during the five-year period July 2012 through June 2017, a slight increase since last year (\$90 million). See table 17. Improvements for the state's public school systems include both new space, whole new schools and additions to existing schools, and improvements in existing school facilities. These costs have been relatively steady overall since 2007 except for a slight dip in 2009. See figure 9.

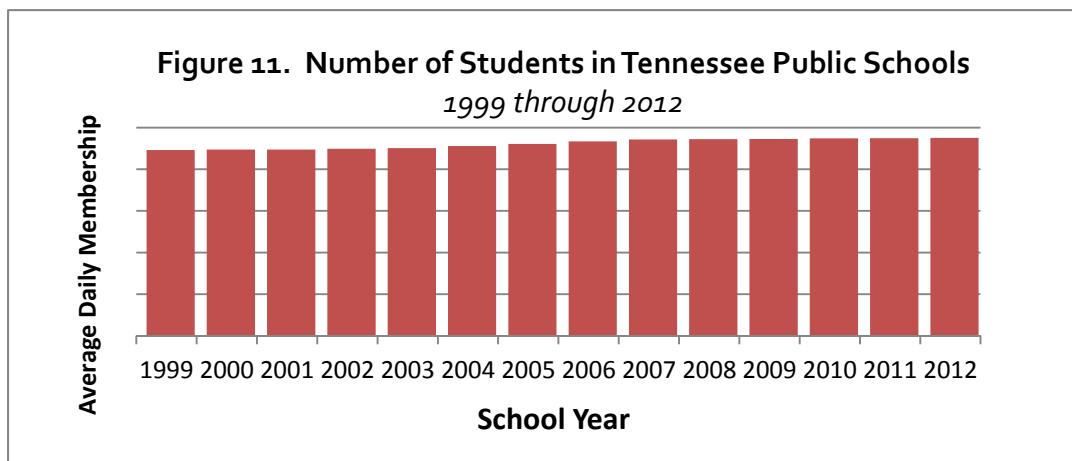
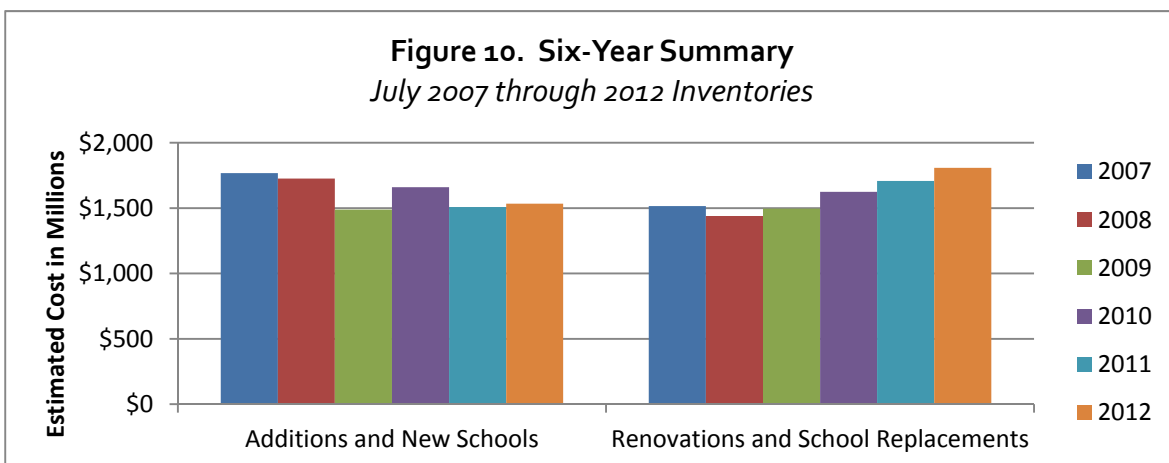
Table 17. Change in School Infrastructure Needs by Type of Need
July 2011 Inventory Compared to July 2012 Inventory

Type of Need	July 2011 Inventory	July 2012 Inventory	Difference	Percent Change
New School Space	\$ 1,496,433,558	\$ 1,534,325,932	\$ 37,892,374	2.5%
New Schools	1,189,623,206	1,215,598,360	25,975,154	2.2%
Additions	306,810,352	318,727,572	11,917,220	3.9%
Improvements to Existing Schools	\$ 2,001,594,801	\$ 2,055,256,934	\$ 53,662,133	2.7%
Renovations	1,408,085,208	1,506,750,565	98,665,357	7.0%
Replacement Schools	299,515,400	302,080,400	2,565,000	0.9%
Technology	168,466,477	124,119,761	(44,346,716)	-26.3%
Mandates	125,527,716	122,306,208	(3,221,508)	-2.6%
System-wide Needs	\$ 7,333,000	\$ 5,791,000	\$ (1,542,000)	-21.0%
Statewide Total	\$ 3,505,361,359	\$ 3,595,373,866	\$ 90,012,507	2.6%

Although the need for additions and new schools has been on a downward trend since 2007, the need for both increased slightly since last year: the amount of money needed for new schools increased \$26 million (2.2%), and the amount needed for additions increased \$12 million (3.9%). The estimated cost for renovations increased \$99 million (7%), and the cost to replace existing schools increased \$2.6 million (1%). The estimated cost of technology infrastructure improvements continues a seven-year downward trend, decreasing \$44 million (26%) in the current inventory. The cost of meeting state and federal mandates also decreased (\$3 million, 2.6%). Costs for improvements needed for such things as bus garages and central office buildings, which serve entire school systems, have been on a downward trend since 2009 and decreased by around \$1.5 million (21%) since last year.



While the total cost of school infrastructure has been flat, there has been a shift from adding new space to renovating existing space in Tennessee’s schools (see figure 10). This shift is partly the result of a slowing of enrollment growth that began in 2007, coinciding with the economic downturn, and remains low (see figure 11). With this change, local officials are reporting higher costs to renovate existing schools. Improvements in existing facilities are typically related to the condition of schools, which overall is better now than it was in the initial years of this inventory; however, even those schools in good or better condition can have significant needs, with parts of the school requiring renovation or replacement.



The need for new public schools and additions increased slightly after declining last year.

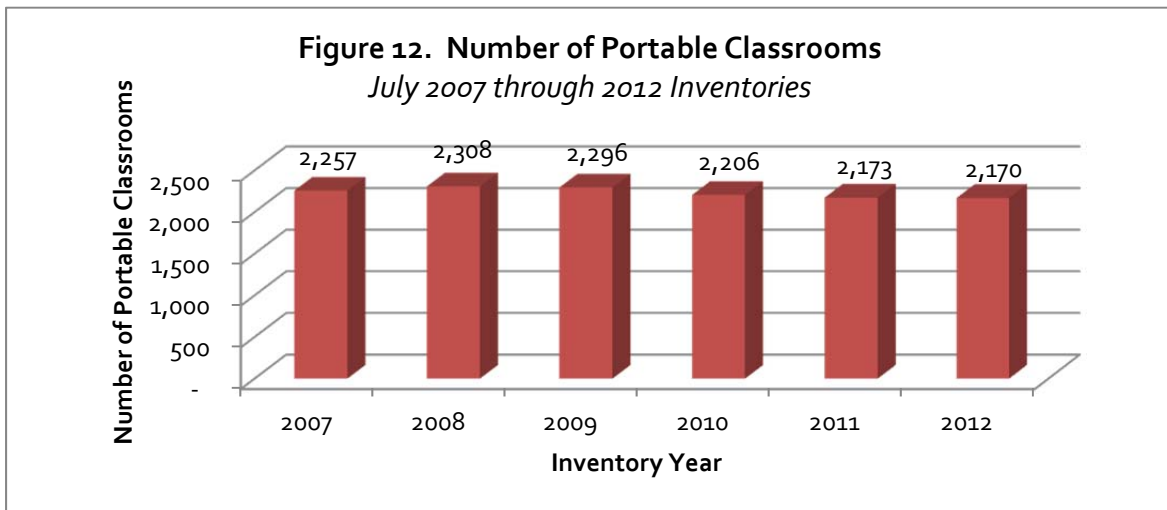
Although the need for several new schools was reported in the inventory, the net increase since last year in the estimated cost of additions and new schools was small (\$26 million, 2.2%) and now totals \$1.2 billion. Local officials increased their estimates by \$47 million for the cost to build nine of the new schools reported in last year's inventory but still not completed. They also added another ten new schools to the inventory totaling \$196 million. These increases were more than offset by the cost of schools that were completed, canceled, or reduced in size or scope, which combined totaled \$217 million. Overton County decided to move students to other existing school buildings and canceled plans for a \$15 million high school first proposed in 2005. Completions included eight new schools costing a combined total of \$119 million.

Likewise, the net increase in estimated cost for additions was small, increasing by \$12 million to a total of \$319 million spread across 191 schools in 70 school systems. New additions totaling \$36 million were partially offset by \$24 million in cancelled or completed additions. The largest net increase (\$6.7 million) was in Montgomery County, most of which was for additional classrooms at four schools at a combined cost of \$6 million. The second largest net increase (\$6 million) was in Williamson County and included a gym at a middle school, 12 additional classrooms at an elementary school, and increases in the estimated cost of new auditoriums at four middle schools.

Another 11 school systems reported a need for additions at 14 schools. Hamblen County's Morristown West High School needs \$6.3 million to add 16 new classrooms, and the William Henry Oliver Middle School in Davidson County needs \$3.7 million for 12 additional classrooms. The remaining systems include both large and small systems with combined needs totaling less than \$13 million.

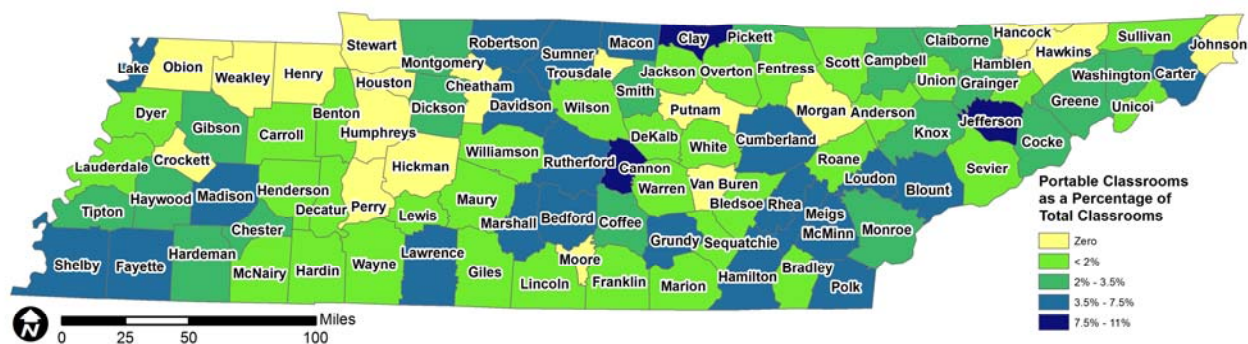
The number of portables has declined slightly as enrollment growth has flattened out.

Statewide, school systems report 2,170 portable classrooms, down by 87 since the 2007 inventory (see figure 12). School systems use portables to deal with unanticipated space shortages, such as those caused by a natural disaster, and to provide temporary classroom space for large influxes of new students while they plan more permanent solutions. Williamson County is a good example of a system that used additional portables as a temporary solution while they were building new schools. In 2007, they used 21 portable classrooms, then increased the number to 61 in 2009 pending construction of five new schools, and then reduced the number to 22 in 2011 when the schools were completed. This year, as they await the completion of four new schools, they increased the use of portables to 28 because of student enrollment growth (4th in the state).



As indicated in figure 12, this year’s total of 2,170 portable classrooms (3.1% of all classrooms) is just three less than the total reported last year. As illustrated in map 6, which sums system-level information on portables to the county level, most counties (77 of 95) rely on portables for 3% or less of their total classroom space. Cannon and Clay counties both use portables for 11% of their classrooms and Jefferson has 8%; these three counties have the largest number of portable classrooms (shaded in dark blue in map 6). Cannon has reported 11% portables each year since the 2007 inventory. In 2010, Clay peaked at 13% portables and Jefferson at 12%. Information on each school system’s portables can be found in appendix G-7.

Map 6. Portable Classrooms as a Percent of Total Classrooms by County
July 2012 Inventory



Twenty-one school systems used more portables in 2012 than in 2007. While most school systems added only a few, five added more than 10 portables—Rhea (18), Cumberland (17), Wilson (13), Montgomery (11), and Knox (10). In the case of Rhea County, two schools added portable classrooms in 2008, which are still in use in 2012 to accommodate student population growth while a new school is being built. Cumberland County had only eight portable classrooms in 2007 but now has 25. Wilson County also increased their use of portable classrooms at three elementary schools, up 13 since 2007, because of increasing enrollment. They are 9th in enrollment growth and report the 3rd highest need for new space. Montgomery County has steadily increased the use of portables from 58 in 2007 to 69 in 2012.

Knox County continues to use 143 portables for the fourth year in a row, and 38 of their 88 schools have at least one portable (43%).

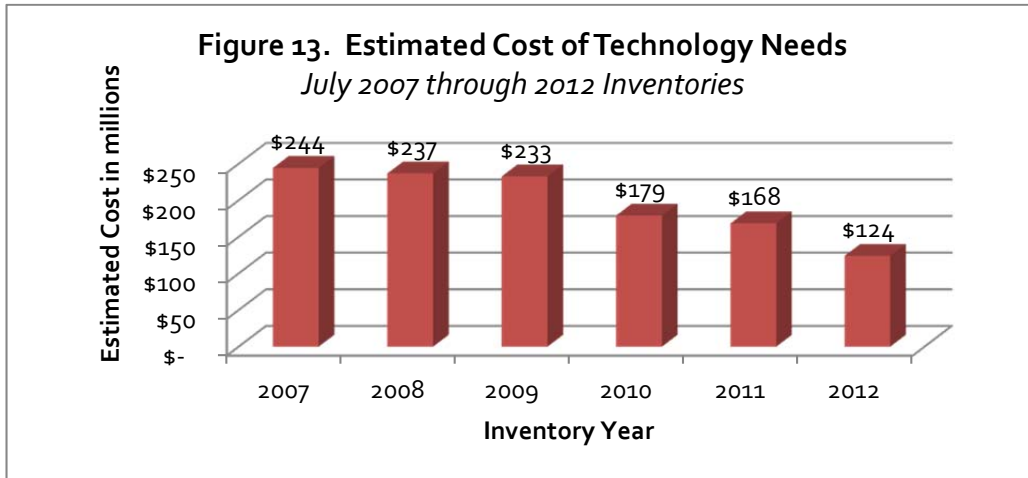
Overall, 29 school systems report fewer portable classrooms in 2012 than they did in 2007. Shelby and Davidson counties, the two largest school systems, had two of the largest decreases in the number of portable classrooms. Respectively, they are using 104 and 332 portables now, which is fewer than in 2007 when they had 147 and 351. They no longer need as many portables because both systems built new schools and completed additions to existing schools. Dyer County now only uses five portable classrooms after using 25 portables since 2007 while they awaited two replacement school projects that were completed in 2012. Similarly, Hardin County decreased its number of portable classrooms to three in 2010 from 28 in 2007 by consolidating five existing schools that used portables into two schools that do not. The other 25 systems with decreases used from one to ten fewer portable classrooms.

Not every system uses portables. The number of systems not using them has increased from 46 in 2007 to 48 in 2012. Four systems that had portable classrooms in 2007 no longer do—Athens, Manchester, and Hawkins and Moore counties. This could be because of slow growing or shrinking enrollment. Student enrollment in Moore County and Manchester increased only slightly during this period—12 and 108 students. Athens' student enrollment decreased by 222 students and Hawkins County decreased by 317. Since 2007, enrollment also decreased in 27 of the other 44 systems without portables.

The need for improvements in existing school buildings continues to increase and now stands at \$2 billion.

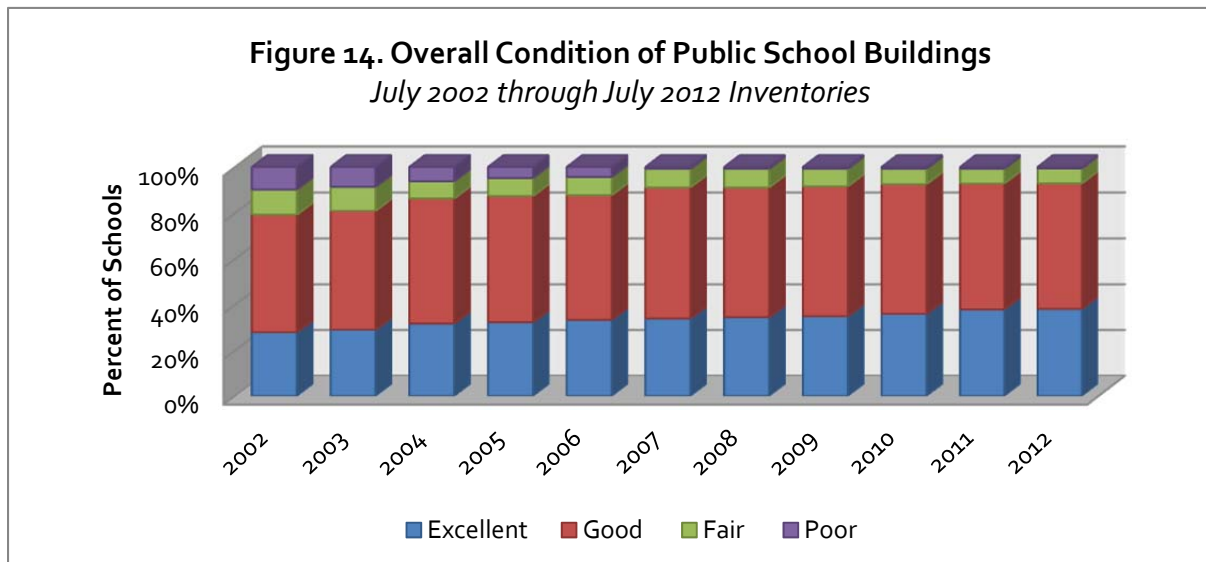
The estimated cost of improving existing schools increased by almost \$54 million since the last report and is \$138 million more than the amount reported in 2007. Improvements in existing school buildings include renovations, replacements, technology upgrades, and changes prompted by state or federal facility mandates. The increased cost for existing school infrastructure is mostly driven by renovations and to a lesser extent, replacements, which are in turn driven by the condition of the schools. The cost of meeting mandates has fluctuated over the years but remains a relatively small percentage of total improvement costs. Since the last inventory, these costs decreased from \$126 million to \$122 million.

The cost to improve technology infrastructure is the one type of improvement at existing public schools that has declined since 2007. These upgrade costs, such as wiring, new computer labs, and security systems, are now at their lowest level since the infrastructure inventory began and are about 17% of their \$716 million peak in 2002. They declined \$44 million (26%) since the last inventory and now stand at \$124 million. See figure 13. Technology infrastructure for new schools is included in their overall cost rather than in these figures.



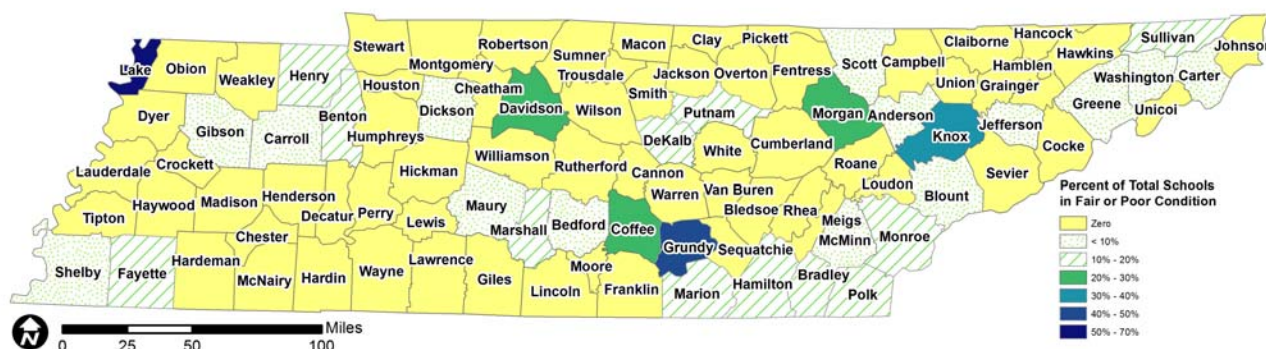
The number of schools in good or excellent condition remains high.

For each inventory, school systems rate the overall condition of their own school buildings as well as the condition of each building component. As figure 14 shows, the number of Tennessee’s public school buildings in good or better condition has been high for several years, and a very small percentage are in fair or poor condition.¹⁵ The number of school buildings in excellent condition increased from 665 in the 2011 inventory to 675, and the number rated good increased from 960 to 967. The number in fair or poor condition (127) increased by one since last year’s inventory and is 7% of the total. Most of these schools have been in fair or poor condition for some time. And as indicated in map 7, they are primarily clustered in a relatively small number of counties.



¹⁵ These condition ratings are defined in appendix C.

Map 7. Percent of School Buildings in Fair or Poor Condition by County
July 2012 Inventory



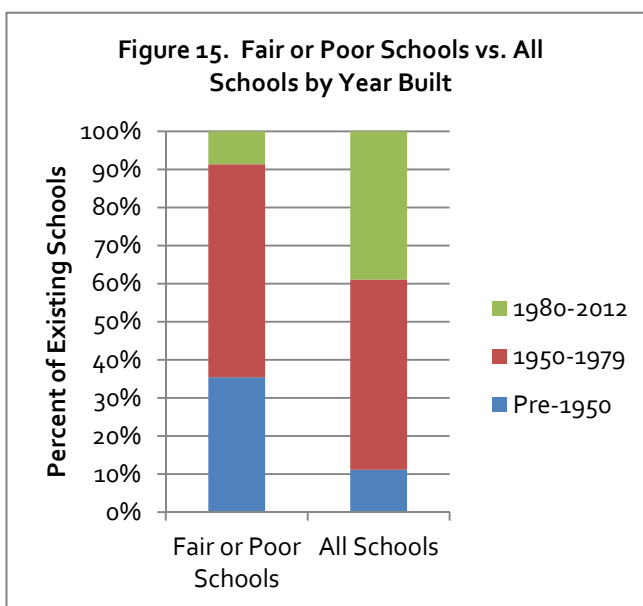
Most schools in fair or poor condition are in urban areas, but some rural areas have higher percentages of schools in fair or poor condition. Nearly half of the schools in fair or poor condition (62) are in just two school systems: Davidson County and Knox County. However, not all urban school systems reported a high percentage of fair or poor schools—Memphis reported only four out of its 198 schools as fair and none as poor. Only three school systems reported half or more of their schools in fair or poor condition—Coffee, Grundy, and Lake County school systems. Lake County has only three schools, two of which are in less than good condition. Grundy County reported half of their schools are in fair or poor condition. While 5 out of 9 of the Coffee County school system’s schools are reported as fair or poor, the 10 schools in the other two systems in that county, Manchester and Tullahoma, are in better condition. Since map 6 aggregates the school systems by county, it shows Coffee County as green, indicating that 5 out of 19 schools (26%) in the county are in less than good condition.

Not surprisingly, older schools are more likely to be in poorer condition. Half of the public school buildings in use today were built in the 1950s, 1960s, and 1970s when the Baby Boom generation was making its way through school. And more than half of the schools in fair or poor condition today were built during that period. Only 11% of schools in use today were built before 1950, but 35% of school buildings rated fair or poor date back to that period. By contrast, 39% of all schools were built in 1980 or later, and only 9% of those in fair or poor condition were built since then. See figure 15.

School systems have two choices to address those schools rated fair or poor—renovate them or replace them. The same choices apply to those schools as they get older and need more than basic maintenance. The cost to renovate or replace all schools in less than good condition is nearly \$660 million (32.1%). See table 18.

The estimated cost to renovate existing schools continues to increase.

Since the last inventory, costs for school renovations increased from \$1.4 billion to \$1.5 billion (7%). This is the third consecutive year the estimated cost of renovations has increased. Renovations needed to bring the 127 schools in fair or poor condition to good or excellent condition will require an estimated \$528 million, an average of \$4.2 million per school. While school buildings in fair or poor condition cost more to fix than those in better condition, renovations at the 1,642 schools in good or excellent



condition make up a larger part of the inventory—\$978 million, approximately \$595 thousand per school. Most schools rated good or excellent require small improvements relative to the costs of improvements at those rated fair or poor, but these small costs add up.

Table 18. Renovation and Replacement Costs for the Ten Systems with the Highest Number of Schools in Fair or Poor Condition
Five-year Period July 2012 through June 2017

School System	All Schools		Schools in Fair or Poor Condition			
	Number of Schools	Estimated Cost to Renovate and Replace	Number of Schools	Percent Fair/Poor	Estimated Cost to Renovate and Replace	Percent of Renovation Needs
Knox County	88	\$ 95,845,848	34	38.6%	\$ 55,718,650	58.1%
Davidson County	139	524,440,800	28	20.1%	202,009,400	38.5%
Hamilton County	76	30,109,500	11	14.5%	20,772,000	69.0%
Coffee County	9	42,005,000	5	55.6%	41,955,000	99.9%
Grundy County	8	7,602,400	4	50.0%	6,662,900	87.6%
Memphis	198	341,691,016	4	2.0%	4,717,000	1.4%
Bradley County	19	14,924,200	3	15.8%	7,874,000	52.8%
Putnam County	21	27,705,000	3	14.3%	26,535,000	95.8%
Bristol	8	40,969,500	3	37.5%	30,217,000	73.8%
Oak Ridge	8	18,814,133	2	25.0%	14,540,000	77.3%
Subtotal	574	\$ 1,144,107,397	97	17%	\$ 411,000,950	35.9%
All Others	1,195	911,149,537	30	3%	248,612,678	27.3%
State Total	1,769	\$ 2,055,256,934	127	7%	\$ 659,613,628	32.1%

Fair or poor schools account for more than half of all renovation costs in 28 of the 34 systems reporting at least one school rated fair or poor. In two systems, Coffee County and Johnson City, all renovation costs are for schools rated fair. Johnson City needs \$51 million to renovate Science Hill High School, and Coffee County needs \$18 million to renovate five of its nine schools.

Even when the overall condition of a school is good or excellent, individual components—such as a classroom, roof, the heating and cooling system, or gymnasium—may need renovation. Statewide, of the 1,642 schools rated good or excellent, 778 need some renovation at an average cost of \$1.3 million per school. Nearly every system, 110 out of 136, have at least one school rated good or excellent that needs some renovation.

The cost to replace schools remains flat.

Sometimes renovating a school is not enough to meet the needs of students, and schools have to be replaced. Local officials report that they need to replace seventeen schools statewide at a combined estimated cost of \$302 million, an increase of \$2.6 million (1%) from last year's report. The reported cost to replace schools has remained at about \$300 million for three consecutive years from a high of \$319 million in 2009. Of the seventeen schools, eight are in good condition, six are in fair condition, two are in poor condition, and one is in excellent condition. Beyond the overall condition of a building, age also appears to be a factor in determining the need to replace a building. All eight of the schools in good condition that need to be replaced were built between 1938 and 1962. All of the six in fair condition that need to be replaced were built before 1994, accounting for \$100 million (33%) of the total cost to replace schools. One is in planning and design, and the other five are still conceptual. Both Putnam County and Oak Ridge have one school each in poor condition that are proposed to be replaced.

Some schools that should be replaced need to be renovated in the meantime. School systems that cannot immediately afford to replace schools may renovate them instead but still report that they need to be replaced. In some cases, school systems plan to use the school to be replaced for another purpose. Wilson County, for example, replaced Lebanon High School with a new building that opened in 2012. The old building will be renovated and used for grades 6 through 8, which will be moved from other county schools.

Larger systems report larger total costs, while smaller systems often have higher costs per student.

School systems with more students also have more school space, which is the main reason larger school systems have greater total needs than smaller systems. Eight of the ten systems with the largest total school infrastructure costs are among the ten systems with the largest number of students (see table 19). The other two systems are Sevier County (11th in enrollment) and Johnson City (24th in enrollment). The ten systems listed in table 19 account for 62% of the total cost of infrastructure improvements needed at Tennessee's public schools. Some systems, such as Davidson County and Memphis, report higher costs to improve existing schools while others, such as Williamson County, report higher costs to build new schools.

Table 19. Ten Systems with the Highest Total Costs for Improvements to Existing Schools
Five-year Period July 2012 through June 2017

School System	Estimated Cost				2012 Students	
	Total	Improvements to Existing Schools		System-wide	Number	Rank
		New Space				
Davidson County	\$ 613,189,800	\$ 524,440,800	\$ 88,749,000	\$ 0	76,130	2
Memphis	344,691,016	341,691,016	3,000,000	0	104,058	1
Williamson County	275,314,000	39,214,000	236,100,000	0	31,949	7
Montgomery County	253,276,339	60,203,000	193,073,339	0	29,728	8
Wilson County	223,017,370	77,017,370	146,000,000	0	15,637	10
Rutherford County	124,696,186	6,060,186	118,636,000	0	38,645	6
Knox County	117,125,848	95,845,848	21,280,000	0	56,298	3
Shelby County	108,379,740	46,279,740	62,100,000	0	45,563	4
Sevier County	88,206,736	12,396,736	75,810,000	0	14,216	11
Johnson City	67,957,788	51,957,788	16,000,000	0	7,425	24
Top Ten Total	\$ 2,215,854,823	\$ 1,255,106,484	\$ 960,748,339	\$ 0	419,649	
All Others	1,379,519,043	800,150,450	573,577,593	5,791,000	530,896	
State Total	\$ 3,595,373,866	\$ 2,055,256,934	\$ 1,534,325,932	\$ 5,791,000	950,545	

Small school systems can be overlooked when considering overall costs. Compared with larger school systems, those with fewer students may report lower infrastructure costs, but when their cost per student is considered, it becomes clear that their needs may be relatively large. See table 20. A small project in a school system with few students can cost more per student than a large project in a system with more students. As with the larger systems, some smaller systems have a greater need to improve existing schools, while others have a greater need to build new schools.

Table 20. Ten Systems with the Highest Per Student Costs for Improvements to Existing Schools
Five-year Period July 2012 through June 2017

School System	Estimated Cost				2012 Students		Cost Per Student
	Total	Improvements to Existing Schools		System-wide	Number	Rank	
		New Space					
Van Buren County	\$ 17,070,000	\$ 570,000	\$ 16,500,000	\$ 0	732	125	\$ 23,307
Pickett County	15,237,500	237,500	15,000,000	0	725	126	21,018
Alcoa	30,400,000	400,000	30,000,000	0	1,749	99	17,385
DeKalb County	45,702,000	1,882,000	43,820,000	0	2,905	78	15,732
Alamo	8,790,000	540,000	8,250,000	0	592	130	14,847
Wilson County	223,017,370	77,017,370	146,000,000	0	15,637	10	14,262
Lake County	10,900,000	10,810,000	90,000	0	873	123	12,485
Bristol	42,969,500	40,969,500	2,000,000	0	3,842	59	11,183
Coffee County	42,005,000	42,005,000	0	0	4,351	51	9,655
Loudon County	45,747,000	27,939,000	17,808,000	0	4,928	43	9,284
Top Ten Total	\$ 481,838,370	\$ 202,370,370	\$ 279,468,000	\$ 0	36,334		\$ 13,262
All Others	3,113,535,496	1,852,886,564	1,254,857,932	5,791,000	914,211		3,406
State Total	\$ 3,595,373,866	\$ 2,055,256,934	\$ 1,534,325,932	\$ 5,791,000	950,545		\$ 3,782

Van Buren County reports the highest cost per student for improvements to existing schools (\$23,307) compared with the state average of \$3,782 per student. Van Buren's high cost per student is driven by a new school that has been in the conceptual phase in the inventory since 2005. Pickett County, with the second highest cost per student (\$21,018), also needs a new

school. As with Van Buren, this school entered the inventory in 2005 and remains conceptual. The cost of new space is also driving high costs per student for DeKalb County, which needs a new \$42 million school, and Alcoa, which now needs \$30 million to build a new high school. Alamo isn't building a new school. Instead, they need \$8.3 million for an expansion to Alamo Elementary.

Bristol and the counties of Lake, Coffee, and Loudon have large costs per student because of improvements to existing schools. Renovations first reported in 2005 are planned at all three of Lake County's schools. With a fair condition rating, Lake County High School needs to renovate all of its classrooms, the cafeteria, the library, administrative offices, and the gym. Margaret Newman Elementary School is reported in fair condition overall, but some components need to be upgraded. Both of these projects remain in the conceptual phase. A third project, the addition of a music classroom at Laura Kendall Elementary School, is currently under construction.

Bristol, which is the 59th largest school system, several times the size of Lake County, has three schools in fair condition that need expensive updates to many components, including classrooms, libraries, gyms, and cafeterias. Most of these have been in the inventory for several years, and all three are working on these needs. Three Bristol schools are in good condition and need just a few upgrades and additions; they have projects under construction addressing technology improvements and Americans with Disabilities Act (ADA) bathroom compliance while overall upgrades and additions remain in the conceptual stage.

Wilson County ranked among those with the highest total cost and also ranked among the systems with the highest cost per student—mainly because of relatively high needs for both new space and improvements to existing schools. Wilson stands out in table 19 because of its larger enrollment, meaning its high cost per student is not an artifact of a small enrollment. Wilson had the third highest new space need in the state, \$146 million for five new schools. Their \$77 million in improvements include one replacement school totaling \$32 million.