

**Building Tennessee's Tomorrow:  
Anticipating the State's Infrastructure Needs**  
*July 2010 through June 2015*

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# Building Tennessee's Tomorrow: Anticipating the State's Infrastructure Needs *July 2010 through June 2015*

## Executive Summary

This report is the tenth in a series on infrastructure that began in the late 1990s. These reports to the General Assembly present Tennessee's public infrastructure needs as reported by local officials, those submitted by state departments and agencies as part of their budget requests to the Governor, and those compiled by the Tennessee Department of Transportation. The information presented in this report was collected during fiscal year 2010-11 and covers the five-year period of July 2010 through June 2015. It provides two types of information: (1) needed infrastructure improvements and (2) the condition of existing elementary and secondary public schools. Needs fall into the six broad categories (see table 1).

**Table 1. Summary of Reported Infrastructure Improvement Needs  
Five-year Period July 2010 through June 2015\***

Category**	Number of Projects or Schools Reported		Five-year Reported Estimated Cost	
Transportation and Utilities	3,937	42.5%	\$19,111,078,452	50.3%
Education***	2,031	21.9%	7,989,887,569	21.0%
Health, Safety, and Welfare	2,035	22.0%	7,343,893,101	19.3%
Recreation and Culture	885	9.6%	1,873,262,025	4.9%
Economic Development	147	1.6%	1,245,424,735	3.3%
General Government	227	2.5%	456,860,274	1.2%
<b>Grand Total</b>	<b>9,262</b>	<b>100.0%</b>	<b>38,020,406,156</b>	<b>100.0%</b>

\*For a complete listing of all reported needs by county and by public school system, see appendixes D and E.

\*\*A list of the types of projects included in the six general categories is shown in table 3. Descriptions of the project types are included in the Glossary of Terms at the end of this report.

\*\*\*Includes improvement needs at existing schools. Number of projects includes the 1,747 schools for which needs were reported.

A number of conclusions may be drawn from the information compiled in the inventory:

- The total need for public infrastructure improvements is estimated at \$38 billion for 2010 through 2015. This total is \$1.2 billion more

The Tennessee General Assembly charged the Tennessee Advisory Commission on Intergovernmental Relations (TACIR) with developing and maintaining an inventory of infrastructure needs "in order for the state, municipal, and county governments of Tennessee to develop goals, strategies and programs which would

- improve the quality of life of its citizens,
- support livable communities, and
- enhance and encourage the overall economic development of the state."

[Public Chapter 817 Acts of 1996]

than the estimate in last year's report, an increase of 3.3%. This increase is larger than last year's record low increase of less than 1% but smaller than all other years. See table 2.

**Table 2. Comparison of Needed Infrastructure Improvements Reported for All Inventories**

<b>Report Year</b>	<b>Five-year Reported Estimated Cost<sup>1</sup></b> [in billions]	<b>Change from Previous Report</b> [in billions]
1999	\$ 13.7	
2001	\$ 18.2	\$ 4.5
2002	\$ 20.5	\$ 2.3
2004	\$ 21.6	\$ 1.1
2005	\$ 24.4	\$ 2.9
2007	\$ 27.6	\$ 3.1
2009	\$ 33.5	\$ 5.9
2010	\$ 36.6	\$ 3.1
2011	\$ 36.8	\$ 0.3
2012	\$ 38.0	\$ 1.2

- Although needs increased in only three categories in the last inventory, they increased in all six categories in the current inventory. But there were decreases within all of those categories except Economic Development. See table 3.

**Table 3. Comparison of Estimated Cost of Infrastructure Improvement Needs July 2009 Inventory vs. July 2010 Inventory**

<b>Category</b>	<b>Reported Cost</b>		<b>Difference</b>	<b>Percent Change</b>
	<b>July 2009 through June 2014</b>	<b>July 2010 through June 2015</b>		
Transportation and Utilities	\$ 18,819,817,112	\$ 19,111,078,452	\$ 291,261,340	1.5%
Education	7,663,212,602	7,989,887,569	326,674,967	4.3%
Health, Safety and Welfare	6,910,054,843	7,343,893,101	433,838,258	6.3%
Recreation and Culture	1,849,601,511	1,873,262,025	23,660,514	1.3%
Economic Development	1,149,679,570	1,245,424,735	95,745,165	8.3%
General Government	422,823,809	456,860,274	34,036,465	8.0%
<b>Grand Total</b>	<b>\$ 36,815,189,447</b>	<b>\$ 38,020,406,156</b>	<b>\$ 1,205,216,709</b>	<b>3.3%</b>

- Transportation and Utilities remains the single largest category in the inventory. It has consistently made up the highest percentage of infrastructure needs since TACIR began reporting them in 1999. Although transportation needs alone increased by \$657 million—the largest increase for any single type of infrastructure—the overall Transportation and Utilities category increased by only \$291 million

<sup>1</sup> Two projects were removed from the July 2009 inventory and are reflected in the total. One of the projects was removed from the July 2004 through July 2008 and is reflected in the totals for report years 2007-2010.

(1.5%). The increase in transportation needs was partially offset by a \$358 million (59.2%) decrease in other utilities, stemming from the completion of one \$405 million electricity infrastructure project in Davidson County.

- Health, Safety, and Welfare, the third largest category in the inventory, increased the most (\$433.8 million). Of the seven types of needs in the Health, Safety, and Welfare category, four increased: water and wastewater, law enforcement, public health facilities, and housing. Even though some types of infrastructure in the Health, Safety, and Welfare category had some of the largest increases, fire protection, storm water, and solid waste all decreased, but that does not necessarily mean that needs reported in past inventories have been met.
- Education needs, the second largest category of infrastructure needs, tend to fluctuate from year to year, exhibiting no clear upward or downward trend. The needs for new public schools increased by \$188.3 million (12.2%) in this inventory after decreasing by \$127.4 million in the last inventory and by \$123.1 million in the 2008 inventory. The need for improvements at existing schools also increased (\$75.7 million) as did post-secondary education and preschool needs (\$63.6 million).
  - Needs for school infrastructure improvements increased by \$262 million (7.5%) in the current inventory. This year's increase is driven both by the need to renovate old schools and the need to build new ones. Reported needs for new public schools in the 2010 inventory are the highest in recent years and reflect an increase of 17.7% over last year's inventory.
  - The number of schools rated good or excellent remains high at 93%. Local officials estimate the costs to renovate or replace schools or parts of schools at \$1.6 billion. While schools that are in fair or poor condition have higher needs per school, the greater part of the costs to renovate and replace schools is for those currently in good or excellent condition.
- Economic Development needs increased by the largest percentage (8.3%) but only the fourth largest dollar amount (\$95.7 million). Estimated costs increased for both types of infrastructure in this category—industrial sites and parks and business district development—but most of the increase (\$66 million) was for industrial sites and parks projects. Business district development needs would have decreased in this year's inventory if not for a \$79 million increase in the estimated cost of the new convention center in Nashville (from \$625 million to \$704 million).
- General Government is the smallest category in terms of total estimated costs and includes only two types of infrastructure: public buildings and other facilities. The estimated cost of other facilities needs more than doubled, increasing by \$66 million, mainly because of a \$46.2 million project in Shelby County to relocate an existing vehicle maintenance building.
- The Recreation and Culture category as a whole remained relatively flat since the last inventory, increasing by only \$23.7 million (1.3%). This category includes three project types: recreation; community development; and libraries, museums, and historic sites. Since the last inventory, recreation needs decreased slightly (2.5% or \$26 million).

- Local officials are confident of only \$11.1 billion of the \$29.5 billion identified as local needs. (These figures do not include needs at existing schools or those in state agencies' capital budget requests.) Most of that amount, \$10.7 billion, is for needs that are fully funded; another \$423 million is for needs that are partially funded. That leaves another \$18.4 billion of needs for which funding is not yet available. While state revenue sources for fully funded infrastructure increased since last year, local sources, which consist of city, county, and special district revenues, remained about the same as last year and continue to be the principal source of funding for fully funded infrastructure.
- Infrastructure needs and the ability to meet them vary across Tennessee. It is no surprise that counties with the greatest populations, growth rates, and tax bases need the most infrastructure and are able to build the most, however, that still doesn't explain what is going on in the other counties.
- Infrastructure needs and the ability to meet them vary across Tennessee. To understand the variation in county-level infrastructure needs and local governments' ability to meet them, TACIR staff looked at infrastructure needs relative to total population, population gain, and wealth factors, including local revenue sources and personal income as a measure of residents' ability to pay taxes. The following conclusions stood out:
  - Population matters, but population gain matters more.
  - When it comes to driving need, income matters most of all.
  - And when it comes to meeting those needs, while population gain matters most, taxable sales come second.

# **BUILDING TENNESSEE'S TOMORROW:**

## **Anticipating the State's Infrastructure Needs**

*July 2010 through June 2015*

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### **Introduction**

One of the greatest fiscal challenges facing our elected officials is dealing with the nation's aging infrastructure. As the population grows and shifts, new classrooms must be built and equipped to meet our children's needs. As roads and bridges wear out, they must be repaired or replaced to ensure our safety. And as outdated water lines begin to crack and fail, they must be upgraded to carry clean drinking water safely and efficiently. These examples are just a few of the ever increasing demands that are plaguing state and local officials as they struggle with the daunting task of matching limited funds to unlimited needs.

Why do we rely on the public sector for roads, bridges, water lines, and schoolhouses instead of looking to the private sector? The private sector does a fine job of providing goods and services when it is possible to monitor and control their use and exclude those who cannot or will not pay an amount sufficient to generate profit. In the interest of general health and safety, excluding users is not always desirable, and profit may not always be possible. Public infrastructure is the answer when the service supported is essential to the common good and the private sector cannot profitably provide it at a price that makes it accessible to all. And so we look to those who represent us in our public institutions to set priorities and find ways to fund them.

#### *Why inventory public infrastructure needs?*

The Tennessee General Assembly affirmed the value of public infrastructure in legislation enacted in 1996 when it deemed an inventory of those needs necessary "in order for the state, municipal, and county governments of Tennessee to develop goals, strategies, and programs which would

- improve the quality of life of its citizens,
- support livable communities, and
- enhance and encourage the overall economic development of the state

through the provision of adequate and essential public infrastructure."<sup>4</sup> The public infrastructure needs inventory on which this report is based was derived from surveys of local officials by staff of the state's nine development districts,<sup>5</sup> the capital budget requests submitted to the Governor by state officials as part of the annual budget process, and bridge

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<sup>4</sup> Chapter 817, Public Acts of 1996. For more information about the enabling legislation, see appendix A.

<sup>5</sup> For more information on the importance of the inventory to the development districts and local officials, see appendix B.

and road needs from project listings provided by state transportation officials. The Commission relies entirely on state and local officials to evaluate the infrastructure needs of Tennessee's citizens as envisioned by the enabling legislation.

### *What infrastructure is included in the inventory?*

For purposes of this report, and based on the direction provided in the public act and common usage, public infrastructure is defined as

*capital facilities and land assets under public ownership  
or operated or maintained for public benefit.*

To be included in the inventory, infrastructure projects must not be considered normal or routine maintenance and must involve a capital cost of at least \$50,000. This approach, dictated by the public act, is consistent with the characterization of capital projects adopted by the Tennessee General Assembly for its annual budget.

Local officials were asked to describe the needs they anticipated during the period of July 1, 2010, through June 30, 2030, classifying those needs by type of project. State-level needs were derived from capital budget requests. Both state and local officials were also asked to identify the stage of development as of July 1, 2010. The period covered by each inventory was expanded to 20 years in 2000 because of legislation requiring its use by the Commission to monitor implementation of Tennessee's Growth Policy Act.<sup>6</sup> Plans developed pursuant to that act established growth boundaries for annexation by the state's municipalities. This report focuses on the first five years of the period covered by the inventory.

Within these parameters, local officials are encouraged to report their needs as they relate to developing goals, strategies, and programs to improve their communities. They are limited by only the very broad purposes for public infrastructure as prescribed by law. No independent assessment of need constrains their reporting. In addition, the inventory includes bridge and road needs from project listings provided by state transportation and capital needs identified by state officials and submitted to the governor as part of the annual budget process.

### *How is the inventory accomplished?*

The public infrastructure needs inventory is developed using two separate, but related, inventory forms.<sup>7</sup> Both forms are used to gather information from local officials about needed infrastructure improvements. The second form is also used to gather information about the condition of existing public school buildings, as well as the cost to meet all facilities mandates at the schools, put them in good condition and provide adequate technology infrastructure. Information about the need for new public school buildings and for school-system-wide infrastructure improvements is gathered in the first form. TACIR staff provide local officials with supplemental information from the state highway department about transportation needs, many of which originate with local officials. This information helps ensure that all known needs are captured in the inventory.

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<sup>6</sup> Chapter 672, Public Acts of 2000.

<sup>7</sup> Both forms are included in appendix C.



In addition to gathering information from local officials, TACIR staff incorporate capital improvement requests submitted by state officials to the Governor's Office into the inventory. While TACIR staff spend considerable time reviewing all the information in the inventory to ensure accuracy and consistency, the information reported in the inventory is based on the judgment of state and local officials. In many cases, information is limited to that included in the capital improvements programs of local governments, which means that it may not fully capture local needs.

Projects included in the inventory are required to be in the conceptual, planning and design, or construction phase at some time during the five-year period of July 2010 through June 2015, and have an estimated cost of at least \$50,000. Projects included are those that need to be either started or completed during that period. Estimated costs for the projects may include amounts spent before July 2010 to start a project that needs to be completed during the five-year period or amounts to be spent after June 2015 to complete a project that needs to be started during the five-year period. Because the source of information from state agencies is their capital budget requests, all of those projects are initially recorded as conceptual.

In the context of the public infrastructure needs inventory, the term "mandate" is defined as *any rule, regulation, or law originating from the federal or state government that affects the cost of a project.*<sup>8</sup> The mandates most commonly reported are the Americans with Disabilities Act (ADA), asbestos, lead, underground storage tanks, and the Education Improvement Act (EIA). The EIA mandate was to reduce the number of students in each public school classroom by an overall average of about 4½ by fall 2001. Tennessee public schools began working toward that goal with passage of the EIA in 1992 and met it by hiring a sufficient number of teachers. However, some schools still do not have sufficient classroom space to accommodate the additional classes and teachers required.

Except in the case of existing public schools, the inventory does not include estimates of the cost to comply with mandates, only whether the need was the result of a mandate; therefore, mandates themselves are not analyzed here other than to report the number of projects affected by mandates. Even in the case of public schools, aside from the EIA, the cost reported to TACIR as part of the public infrastructure needs inventory is relatively small—less than 1% of the total.

### *How is the inventory used?*

The Public Infrastructure Needs Inventory is both a product and a continuous process, one that has been useful in

- *short-term and long-range planning,*
- *providing a framework for funding decisions,*
- *increasing public awareness of infrastructure needs, and*
- *fostering better communication and collaboration among agencies and decision makers.*

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<sup>8</sup> See the Glossary of Terms at the end of the report.

**Short-term and long-range planning is often the one opportunity for proactive thinking.**

The Public Infrastructure Needs Inventory has become a tool for setting priorities and making informed decisions by all stakeholders. Many decision makers have noted that in a time of tight budgets and crisis-based, reactive decisions, the annual inventory process is the one opportunity they have to set funding issues aside for a moment and think proactively and broadly about their very real infrastructure needs. For most officials in rural areas and in smaller cities, the inventory is the closest thing they have to a capital improvements program (CIP). Without the inventory, they would have little opportunity or incentive to consider their infrastructure needs. Because the inventory is not limited to needs that can be funded in the short term, it may be the only reason they have to consider the long-range benefits of infrastructure.

**The inventory helps match critical needs to limited funding opportunities.**

The Public Infrastructure Needs Inventory provides the basic information that helps state and local officials match needs with funding, especially in the absence of a formal capital improvements program. At the same time, the inventory provides information needed by the development districts to update their respective *Comprehensive Economic Development Strategy Reports* required annually by the Federal Economic Development Administration. Unless a project is listed in that document, it will not be considered for funding by that agency. Information from the inventory has been used to develop lists of projects suitable for other types of state and federal grants as well. For example, many projects that have received Community Development Block Grants were originally discovered in discussions of infrastructure needs with local government officials. And it has helped state decision makers identify gaps between critical needs and available state, local, and federal funding, including an assessment of whether various communities can afford to meet their infrastructure needs or whether some additional planning needs to be done at the state level about how to help them.

**The inventory provides an annual review of conditions and needs of public school facilities.**

The schools' portion of the inventory is structured so that the condition of all schools is known, not just the ones in need of repair or replacement. Data can be retrieved from the database and analyzed to identify particular needs, such as technology. This information is useful in pinpointing pressing needs for particular schools and districts, as well as providing an overview of statewide needs. This unique statewide database provides information about the condition and needs of Tennessee's public school facilities.

**The inventory increases public awareness, communication, and collaboration among decision-makers.**

The state's infrastructure needs have been reported to a larger public audience, and the process has fostered better communication between the development districts, local and state officials, and decision makers. The resulting report has become a working document used at the local, regional and state levels. It gives voice to the often-underserved small towns and rural communities. Each update of the report provides an opportunity for re-evaluation and re-examination of projects and for improvements in the quality of the inventory and the report itself. This report is unique in terms of its broad scope and

comprehensive nature. Through the inventory process, development districts have expanded their contact, communication, and collaboration with agencies not traditionally sought after (e, g., local boards of education, utility districts, the Tennessee Department of Transportation) and strengthened personal relationships and trust with their more traditional local and state contacts. Infrastructure needs are being identified, assessed, and addressed locally and documented for the Tennessee General Assembly, various state agencies, and decision makers for further assessment and consideration.

*What else needs to be done?*

The data collection process continues to improve, and the current inventory is more complete and accurate than ever. The Commission has tried to strike a balance between requiring sufficient information to satisfy the intent of the law and creating an impediment to local officials reporting their needs. By law, the inventory is required of TACIR, but it is not required of state or local officials; they may decline to participate without penalty. Similarly, they may provide only partial information. This can make comparisons across jurisdictions and across time difficult. But with each annual inventory, participants have become more familiar with the process and more supportive of the program.

Improvements in the technological infrastructure of the inventory itself have set the stage for future efforts to make the inventory more accessible and useful to state and local policy makers and to researchers. A recent report on the condition of Tennessee's public schools will soon be available on the web. Future work will include a closer look at financing the infrastructure needs across the state.



# Building Tennessee's Tomorrow: Anticipating the State's Infrastructure Needs *July 2010 through June 2015*

## Infrastructure Needs Statewide

***Total needs reported equal \$38 billion, a 3.3% increase since the last inventory.***

State and local officials estimate the cost of public infrastructure improvements that should be started or completed sometime between July 1, 2010, and June 30, 2015, at \$38 billion (see table 4). This total is \$1.2 billion<sup>1</sup> more than the estimate in last year's report, an increase of 3.3% (see table 5). This increase is larger than last year's record low increase of less than 1% but smaller than all other years.

**Table 4. Total Number and Estimated Cost of Needed Infrastructure Improvements  
Five-year Period July 2010 through June 2015<sup>2</sup>**

Category and Type of Infrastructure	Number of Projects or Schools Reported	Percent of Total	Estimated Cost	Percent of Total
<b>Transportation and Utilities</b>	<b>3,937</b>	<b>42.5%</b>	<b>\$ 19,111,078,452</b>	<b>49.9%</b>
Transportation	3,859	41.7%	18,847,862,743	49.2%
Other Utilities	73	0.8%	246,815,709	0.6%
Telecommunications	5	0.1%	16,400,000	0.0%
<b>Education</b>	<b>2,031</b>	<b>21.9%</b>	<b>\$ 7,989,887,569</b>	<b>21.5%</b>
Post-secondary and Preschools	634	6.8%	4,160,572,926	10.9%
Existing School Improvements	1,261	13.6%	1,981,658,039	5.9%
New Public School Construction	84	0.9%	1,736,322,427	4.5%
School System-wide Need	52	0.6%	111,334,177	0.3%
<b>Health, Safety, and Welfare</b>	<b>2,035</b>	<b>22.0%</b>	<b>\$ 7,343,893,101</b>	<b>19.2%</b>
Water and Wastewater	1,411	15.2%	4,363,595,602	11.4%
Law Enforcement	273	2.9%	1,946,321,789	5.1%
Public Health Facilities	95	1.0%	443,995,100	1.2%
Storm Water	78	0.8%	350,741,182	0.9%
Fire Protection	128	1.4%	175,805,428	0.5%
Solid Waste	45	0.5%	38,334,000	0.1%
Housing	5	0.1%	25,100,000	0.1%
<b>Recreation and Culture</b>	<b>885</b>	<b>9.6%</b>	<b>\$ 1,873,262,025</b>	<b>4.9%</b>
Recreation	691	7.5%	1,058,942,803	2.8%
Community Development	88	1.0%	417,136,832	1.1%
Libraries, Museums, and Historic Sites	106	1.1%	397,182,390	1.0%
<b>Economic Development</b>	<b>147</b>	<b>1.6%</b>	<b>\$ 1,245,424,735</b>	<b>3.3%</b>
Business District Development	35	0.4%	984,422,620	2.6%
Industrial Sites and Parks	112	1.2%	261,002,115	0.7%
<b>General Government</b>	<b>227</b>	<b>2.5%</b>	<b>\$ 456,860,274</b>	<b>1.2%</b>
Public Buildings	197	2.1%	359,311,437	0.9%
Other Facilities	30	0.3%	97,548,837	0.3%
<b>Grand Total</b>	<b>9,262</b>	<b>100.0%</b>	<b>\$ 38,020,406,156</b>	<b>100.0%</b>

<sup>1</sup> Totals for the July 2009 inventory have been adjusted to reflect the removal of two projects.

<sup>2</sup> For complete listings of all needs reported in the July 2010 inventory by county and by public school system, see appendixes D and E.

**All categories increased in cost since the last inventory, though at least one type of infrastructure in most categories decreased in cost.**

Public infrastructure needs are divided into six major categories: Transportation and Utilities; Education; Health, Safety, and Welfare; Recreation and Culture; Economic Development; and General Government. Each of the categories includes two or more types of infrastructure needs. Although needs increased in only three categories in the last inventory, they increased in all six categories in the current inventory. But there were decreases within all of those categories except Economic Development. See table 5.

**Table 5. Comparison of Estimated Cost of Needed Infrastructure Improvements  
July 2009 Inventory vs. July 2010 Inventory**

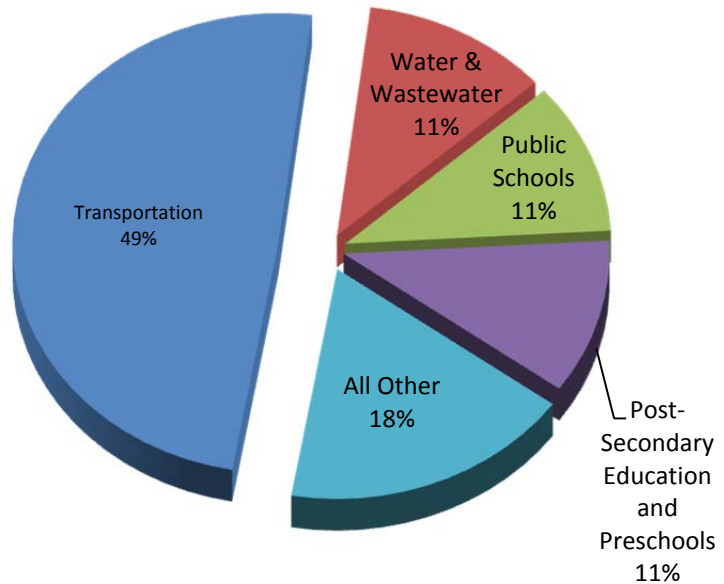
<b>Category and Type of Need</b>	<b>July 2009 Inventory</b>	<b>July 2010 Inventory</b>	<b>Difference</b>	<b>Percent Change</b>
<b>Transportation and Utilities</b>	<b>\$18,819,817,112</b>	<b>\$19,111,078,452</b>	<b>\$291,261,340</b>	<b>1.5%</b>
Transportation <sup>3</sup>	18,190,536,778	18,847,862,743	657,325,965	3.6%
Other Utilities	604,980,334	246,815,709	(358,164,625)	-59.2%
Telecommunications	24,300,000	16,400,000	(7,900,000)	-32.5%
<b>Education</b>	<b>\$7,663,212,602</b>	<b>\$7,989,887,569</b>	<b>\$326,674,967</b>	<b>4.3%</b>
Post-secondary and Preschools	4,096,971,228	4,160,572,926	63,601,698	1.6%
Existing School Improvements	1,905,950,380	1,981,658,039	75,707,659	4.0%
New Public School Construction	1,548,048,421	1,736,322,427	188,274,006	12.2%
School System-wide Need	112,242,573	111,334,177	(908,396)	-0.8%
<b>Health, Safety, and Welfare</b>	<b>\$6,910,054,843</b>	<b>\$7,343,893,101</b>	<b>\$433,838,258</b>	<b>6.3%</b>
Water and Wastewater	4,004,577,600	4,363,595,602	359,018,002	9.0%
Law Enforcement	1,880,411,799	1,946,321,789	65,909,990	3.5%
Public Health Facilities	395,978,500	443,995,100	48,016,600	12.1%
Storm Water	355,315,165	350,741,182	(4,573,983)	-1.3%
Fire Protection	218,981,756	175,805,428	(43,176,328)	-19.7%
Solid Waste	40,152,000	38,334,000	(1,818,000)	-4.5%
Housing	14,638,023	25,100,000	10,461,977	71.5%
<b>Recreation and Culture</b>	<b>\$1,849,601,511</b>	<b>\$1,873,262,025</b>	<b>\$23,660,514</b>	<b>1.3%</b>
Recreation	1,084,915,057	1,058,942,803	(25,972,254)	-2.4%
Community Development	390,159,397	417,136,832	26,977,435	6.9%
Libraries, Museums, and Historic Sites	374,527,057	397,182,390	22,655,333	6.0%
<b>Economic Development</b>	<b>\$1,149,679,570</b>	<b>\$1,245,424,735</b>	<b>\$95,745,165</b>	<b>8.3%</b>
Business District Development	954,870,620	984,422,620	29,552,000	3.1%
Industrial Sites and Parks	194,808,950	261,002,115	66,193,165	34.0%
<b>General Government</b>	<b>\$422,823,809</b>	<b>\$456,860,274</b>	<b>\$34,036,465</b>	<b>8.0%</b>
Public Buildings <sup>4</sup>	391,686,472	359,311,437	(32,375,035)	-8.3%
Other Facilities	31,137,337	97,548,837	66,411,500	213.3%
<b>Grand Total</b>	<b>\$36,815,189,447</b>	<b>\$38,020,406,156</b>	<b>\$1,205,216,709</b>	<b>3.3%</b>

<sup>3</sup> One project with an estimated cost of \$700 million was removed from the 2009 inventory because staff determined that it was not public infrastructure.

<sup>4</sup> One project with an estimated cost of \$50 million was removed from the 2009 inventory because staff determined that it was a duplicate.

Comprising nearly half of all needs reported, Transportation and Utilities remains the single largest category in the inventory. It has consistently made up the highest percentage of infrastructure needs since TACIR began reporting them in 1999. The category consists of three types of infrastructure: transportation, other utilities, and telecommunications. Transportation needs alone have comprised about half of total infrastructure needs in each of the last five reports. Combined, the other two project types within the Transportation and Utilities category—other utilities and telecommunications—amount to less than one percent of the total reported cost of infrastructure improvements needed during the five-year period covered by this inventory. As shown in figure 2, transportation needs, water and wastewater infrastructure improvement needs, new public school construction needs, and post-secondary and preschool needs dominate the statewide inventory. Collectively, these four types of infrastructure represent 82% of total estimated costs reported.

**Figure 2. Percent of Total Reported Cost of Needs by Type of Infrastructure Five-year Period July 2010 through June 2015**



Although transportation needs alone increased by \$657 million—the largest increase for any single type of infrastructure—the overall Transportation and Utilities category increased by only \$291 million (1.5%). The increase in transportation needs was partially offset by a \$358 million (59.2%) decrease in other utilities, stemming from the completion of one \$405 million electricity infrastructure project in Davidson County. Telecommunications, the smallest project type in the inventory, decreased by 32.5% since the last report. With telecommunications projects totaling only \$16.4 million, any change in this project type can produce a significant percentage change. It should be noted that the Transportation and Utilities category does not include water utilities; those needs are reported in the Health, Safety, and Welfare category.

Transportation infrastructure needs can be divided into subtypes as shown in table 6. Of course, the bulk of transportation needs consists of roads, which comprise

**Table 6. Transportation Needs by Subtype Five-year Period July 2010 through June 2015**

Transportation Subtype	Number of	
	Projects	Estimated Cost
<b>Roads</b>	1,265	\$ 14,385,196,073
<b>Bridges</b>	1,890	3,060,625,521
<b>Rail</b>	102	342,621,733
<b>Navigation</b>	5	338,173,693
<b>Other</b>	205	172,175,629
<b>Sidewalks</b>	208	165,477,366
<b>Air</b>	78	159,568,935
<b>Intelligent Transportation System</b>	15	124,196,784
<b>Signalization</b>	88	78,477,009
<b>Public Transit</b>	3	21,350,000
<b>Transportation Total</b>	<b>3,859</b>	<b>\$ 18,847,862,743</b>

\$14.4 billion or more than three-fourths of the \$18.8 billion total. Other transportation infrastructure needs include bridges, rail, and navigation. Because completion of a single project may involve various elements that are not reported separately, any given subtype in table 6 may include components that fall into other subtypes. Costs reported for the roads subtype, for example, will include the cost of signalization, sidewalks, and other subtypes when those costs are not broken out.

Health, Safety, and Welfare, the third largest category in the inventory, increased the most (\$433.8 million). Of the seven types of infrastructure included in the Health, Safety, and Welfare category, four increased: water and wastewater, law enforcement, public health facilities, and housing. Water and wastewater infrastructure needs make up about 83% of the dollar increase in this category. Since the last inventory, water and wastewater needs increased by approximately \$359 million (9%). Two projects in Davidson County make up most of that increase. The larger of the two projects, an improvement to an existing sewer system, is estimated to cost \$270 million. This is a \$190 million increase from the previous inventory. The other project, construction of a wastewater management plant, is estimated to cost \$118 million. Although overall water and wastewater needs increased since the last inventory, 160 water and wastewater projects totaling over \$213 million were completed.

Law enforcement needs, the second largest type of infrastructure in the Health, Safety, and Welfare category, increased by \$65.9 million (3.5%) since the last report. Several new projects were added totaling more than \$140 million. Although \$106.7 million in projects were completed, that was not enough to offset the needs that were added. Five projects each have estimated costs of \$10 million or more. The largest of those is the relocation of the department of safety headquarters in Davidson County, estimated to cost \$43.2 million. The second largest project is a youth development center in Gibson County totaling \$14.5 million. The other projects include the relocation of the Tennessee Highway Patrol headquarters in Knoxville to a new 14,000-square-foot building, funding for a new vehicle shop for the West Precinct in Shelby County, and a jail renovation project in Hamblen County.

Public health facilities needs, also part of the same category, have increased over the last three inventories, and very few projects are being completed. Public health facilities needs increased by \$48 million (12.1%). About \$12.4 million (slightly more than one-fourth) of that increase stems from a need for a new regional health center in Maury County. Since the last inventory, only eight public health facility projects were completed, totaling \$37 million. Public housing increased by the largest percentage (71.5%) because of a \$10 million public housing project added in Van Buren County. Even though some types of infrastructure in the Health, Safety, and Welfare category had some of the largest increases, fire protection, storm water, and solid waste all decreased, but that does not necessarily mean that needs reported in past inventories have been met. For example, the \$43 million decrease (19.7%) in fire protection needs occurred because estimates for twelve fire protection projects were revised downward. The estimated cost of one such project to repair a fire station in Shelby County decreased by roughly half, from \$30.3 million to \$15.6 million.

Education needs, the second largest category of infrastructure needs, tend to fluctuate from year to year, exhibiting no clear upward or downward trend. After two years of decreases, the needs for new public schools increased by \$188.3 million (12.2%) in this inventory after decreasing by \$127.4 million in the last inventory and by \$123.1 million in the 2008 inventory. The need for improvements at existing schools also increased (\$75.7 million) as did post-secondary and preschool needs (\$63.6 million). Post-secondary and preschool infrastructure includes the state's public colleges and universities, vocational programs, and pre-kindergarten programs, such as Head Start. The modest increase in post-secondary and preschool needs is slightly lower than last



year's increase but considerably lower than it was two years ago when these needs increased by 33.2%. Details about changes in public school needs are discussed in the school chapter later in this report.

Economic Development needs increased by the largest percentage (8.3%) but only the fourth largest dollar amount (\$95.7 million). Estimated costs increased for both types of infrastructure in this category—industrial sites and parks and business district development—but most of the increase (\$66 million) was for industrial sites and parks projects. Two Shelby County projects totaling nearly \$43 million account for the largest portion of that dollar increase. Both projects involve railroad construction for industrial sites. Smaller projects in many counties make up the remaining \$23 million increase. Business district development needs would have decreased in this year's inventory if not for a \$79 million increase in the estimated cost of the new convention center in Nashville (from \$625 million to \$704 million).

General Government is the smallest category in terms of total estimated costs and includes only two types of infrastructure: public buildings and other facilities, which include storage, maintenance, and similar facilities that do not fit the definition of a more specific type of need. The estimated cost of other facilities needs more than doubled, increasing by \$66 million, mainly because of a \$46.2 million project in Shelby County to relocate an existing vehicle maintenance building so that St. Jude Children's Hospital can be expanded. Only four projects of this type were completed since the last report, totaling \$17 million. The increase in other facilities needs was partially offset by a \$32 million decrease in public building needs. A total of twenty-four projects were completed and five were canceled.

The Recreation and Culture category as a whole remained relatively flat since the last inventory, increasing by only \$23.7 million (1.3%). This category includes three types of infrastructure: recreation; community development; and libraries, museums, and historic sites. Recreation needs decreased slightly (2.5% or \$26 million) since the last inventory. Individual recreation projects tend to cost less than other types of infrastructure. Needs of this type in the current inventory range in cost from \$72,561 for a walking trail in Hickman County to \$10 million for the Swan Pond Recreation Area in Roane County.

Interestingly, community development and libraries, museums, and historic sites increased by about as much as recreation needs decreased. Community development has increased for the third consecutive inventory, but this year's \$27 million increase is much smaller than increases in previous inventories (\$42.1 million in 2009 and \$46.6 million in 2008). The increase in libraries, museums, and historic sites (\$22.7 million) includes a \$20 million project in Memphis for the Pink Palace. This project has been in the inventory for several years but has just now come into the five-year period.

“We must pass legislation to maintain investment in our roads, bridges, transit, and water resources. And we can no longer afford short-term extensions. Without the certainty of multi-year funding, projects will continue to be delayed, allowing infrastructure to fall further into disrepair and pushing land, labor, and materials costs higher.”

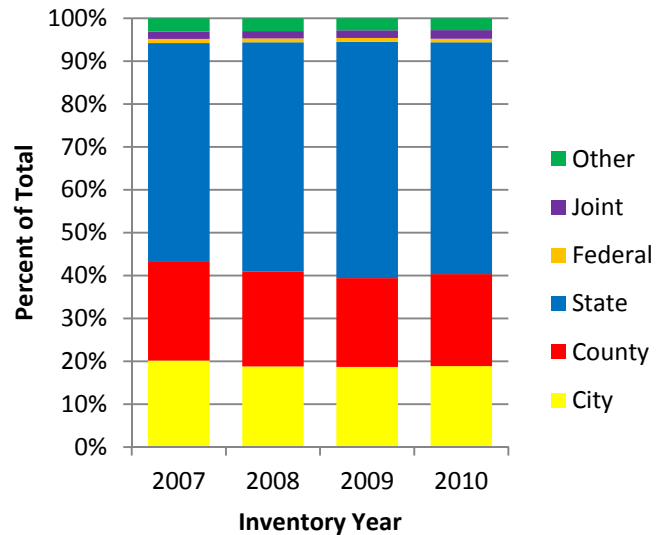
-Tom Donohue

Free Enterprise,  
2012.

**State infrastructure needs continue to dominate overall, and county needs continue to exceed city needs.**

Although local officials report the greatest need for new infrastructure, they won't necessarily "own" it. Many of the needs identified by local officials may be owned or controlled by federal or state agencies or public utilities. State agencies own or will own more than half of all infrastructure needs in the inventory (54.4%). The largest portion of six of the twenty-one types—transportation; post-secondary and preschools; school system-wide needs; law enforcement; public health facilities; and libraries, museums, and historic sites—belongs to the state. Slightly more than three-fourths of transportation infrastructure needs are the responsibility of the state. Figure 3 illustrates that the distribution of infrastructure needs by level of government has remained fairly constant over the last four inventories.

**Figure 3. Four-Year Comparison of Ownership and Percent of Total Reported Cost of Infrastructure Needs by Level of Government**



Nearly all post-secondary and preschool infrastructure needs belong to the state's public colleges and universities. In fact, these needs and transportation needs comprise the bulk of state-owned infrastructure needs in the inventory, accounting for \$18.3 million of the \$20.7 million total reported for state government. The next largest areas of state responsibility are law enforcement and public health facilities. As shown in table 7, state needs exceed 68% of the totals for both of these types of infrastructure even though the dollar amounts are relatively small.

At the local level, infrastructure needed by counties still exceeds cities' needs overall, mainly because of needs reported in two categories: Education and Economic Development. Counties' infrastructure needs are over 84% of the Economic Development category, mainly because of the new convention center in Nashville. The convention center accounts for nearly 80% of all business district development needs and two-thirds of the total for the entire Economic Development category. The convention center is treated as a county need because it is reported by a metropolitan government. Metropolitan governments have the characteristics of incorporated places and remain administrative divisions of the state with all the responsibilities of counties. For that reason, they are treated as county governments in the inventory. Counties are also responsible for most of the solid waste (69.4%), new school construction (91.4%), and existing school improvement (77.5%) needs.

On the other hand, cities need most of the infrastructure in nearly half of all types (10 of 21) in the inventory. Cities need the largest portion in the Health, Safety, and Welfare category (37.9%) and in the Recreation and Culture category (52%). Nearly half (48.6%) of the water and wastewater infrastructure in the inventory will belong to cities as will more than half (58.2%) of public housing, and most of the storm water (97%), fire protection (85.1%), and community development infrastructure (77%).

**Table 7. Total Estimated Cost in Millions and Percent of Total of Needed Infrastructure Improvements  
by Project Type and Level of Government  
Five-year Period July 2010 through June 2015**

<b>Category and Project Type</b>	<b>City</b>		<b>County</b>		<b>State</b>		<b>Federal</b>		<b>Joint</b>		<b>Other</b>		<b>Total</b>
<b>Transportation and Utilities</b>	<b>\$2,426.6</b>	<b>12.7%</b>	<b>\$1,732.0</b>	<b>9.1%</b>	<b>\$14,166.3</b>	<b>74.1%</b>	<b>\$300.0</b>	<b>1.6%</b>	<b>\$409.1</b>	<b>2.1%</b>	<b>\$76.9</b>	<b>0.4%</b>	<b>\$19,111.1</b>
Transportation	2,258.4	12.0%	1,705.0	9.0%	14,166.3	75.2%	300.0	1.6%	403.1	2.1%	15.0	0.1%	18,847.9
Other Utilities	158.6	64.3%	20.3	8.2%	0.0	0.0%	0.0	0.0%	6.0	2.4%	61.9	25.1%	246.8
Telecommunications	9.6	58.5%	6.8	41.5%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	16.4
<b>Education</b>	<b>\$566.7</b>	<b>7.1%</b>	<b>\$3,139.0</b>	<b>39.3%</b>	<b>\$4,235.6</b>	<b>53.0%</b>	<b>\$0.0</b>	<b>0.0%</b>	<b>\$8.0</b>	<b>0.1%</b>	<b>\$40.5</b>	<b>0.5%</b>	<b>\$7,989.9</b>
Post-secondary and Preschools	1.5	0.0%	2.2	0.1%	4,148.9	99.7%	0.0	0.0%	8.0	0.2%	0.0	0.0%	4,160.6
Existing School Improvements	420.8	21.2%	1,536.3	77.5%	0.0	0.0%	0.0	0.0%	0.0	0.0%	24.5	1.2%	1,981.7
New Public School Construction	133.3	7.7%	1,587.0	91.4%	0.0	0.0%	0.0	0.0%	0.0	0.0%	16.0	0.9%	1,736.3
School System-wide Need <sup>5</sup>	11.1	10.0%	13.5	12.1%	86.7	77.9%	0.0	0.0%	0.0	0.0%	0.0	0.0%	111.3
<b>Health, Safety, and Welfare</b>	<b>\$2,785.6</b>	<b>37.9%</b>	<b>\$1,655.3</b>	<b>22.5%</b>	<b>\$1,738.8</b>	<b>23.7%</b>	<b>\$0.0</b>	<b>0.0%</b>	<b>\$241.0</b>	<b>3.3%</b>	<b>\$923.2</b>	<b>12.6%</b>	<b>\$7,343.9</b>
Water and Wastewater	2,121.0	48.6%	1,082.1	24.8%	0.0	0.0%	0.0	0.0%	237.3	5.4%	923.2	21.2%	4,363.6
Law Enforcement	147.8	7.6%	467.1	24.0%	1,331.5	68.4%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1,946.3
Storm Water	340.2	97.0%	7.1	2.0%	0.4	0.1%	0.0	0.0%	3.0	0.9%	0.0	0.0%	350.7
Public Health Facilities	1.2	0.3%	36.6	8.2%	406.3	91.5%	0.0	0.0%	0.0	0.0%	0.0	0.0%	444.0
Fire Protection	149.6	85.1%	25.3	14.4%	0.6	0.3%	0.0	0.0%	0.3	0.2%	0.0	0.0%	175.8
Solid Waste	11.3	29.5%	26.6	69.4%	0.0	0.0%	0.0	0.0%	0.4	1.1%	0.0	0.0%	38.3
Housing	14.6	58.2%	10.5	41.8%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	25.1
<b>Recreation and Culture</b>	<b>\$975.0</b>	<b>52.0%</b>	<b>\$369.5</b>	<b>19.7%</b>	<b>\$469.7</b>	<b>25.1%</b>	<b>\$0.2</b>	<b>0.0%</b>	<b>\$55.4</b>	<b>3.0%</b>	<b>\$3.5</b>	<b>0.2%</b>	<b>\$1,873.3</b>
Recreation	548.2	51.8%	210.3	19.9%	242.9	22.9%	0.2	0.0%	53.8	5.1%	3.5	0.3%	1,058.9
Community Development	321.1	77.0%	88.7	21.3%	5.8	1.4%	0.0	0.0%	1.6	0.4%	0.0	0.0%	417.1
Libraries, Museums, and Historic Sites	105.7	26.6%	70.5	17.8%	221.0	55.6%	0.0	0.0%	0.0	0.0%	0.0	0.0%	397.2
<b>Economic Development</b>	<b>\$131.1</b>	<b>10.5%</b>	<b>\$1,047.3</b>	<b>84.1%</b>	<b>\$0.2</b>	<b>0.0%</b>	<b>\$0.0</b>	<b>0.0%</b>	<b>\$49.4</b>	<b>4.0%</b>	<b>\$17.3</b>	<b>1.4%</b>	<b>\$1,245.4</b>
Business District Development	84.4	8.6%	881.1	89.5%	0.0	0.0%	0.0	0.0%	19.0	1.9%	0.0	0.0%	984.4
Industrial Sites and Parks	46.8	17.9%	166.3	63.7%	0.2	0.1%	0.0	0.0%	30.4	11.7%	17.3	6.6%	261.0
<b>General Government</b>	<b>\$276.1</b>	<b>60.4%</b>	<b>\$76.0</b>	<b>16.6%</b>	<b>\$84.1</b>	<b>18.4%</b>	<b>\$20.0</b>	<b>4.4%</b>	<b>\$0.0</b>	<b>0.0%</b>	<b>\$0.8</b>	<b>0.2%</b>	<b>\$456.9</b>
Public Buildings	201.7	56.1%	66.4	18.5%	70.5	19.6%	20.0	5.6%	0.0	0.0%	0.8	0.2%	359.3
Other Facilities	74.4	76.3%	9.5	9.8%	13.6	14.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	97.5
<b>Grand Total</b>	<b>\$7,161.2</b>	<b>18.8%</b>	<b>\$8,019.1</b>	<b>21.1%</b>	<b>\$20,694.7</b>	<b>54.4%</b>	<b>\$320.2</b>	<b>0.8%</b>	<b>\$762.9</b>	<b>2.0%</b>	<b>\$1,062.3</b>	<b>2.8%</b>	<b>\$38,020.4</b>

<sup>5</sup> System-wide needs include the state's special schools.

**Table 8. Needed Infrastructure Improvements in Millions and Percent of Total  
by Category, Project Type, and Stage of Development  
Five-year Period July 2010 through June 2015<sup>6</sup>**

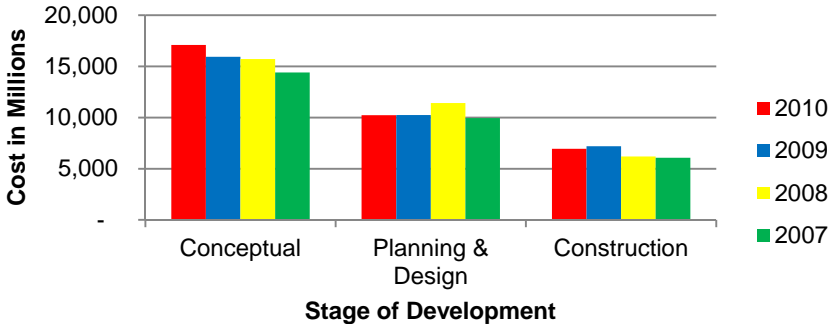
Category and Type of Need	Conceptual				Planning & Design				Construction			
	Number		Cost		Number		Cost		Number		Cost	
<b>Transportation and Utilities</b>	<b>2,511</b>	<b>63.8%</b>	<b>\$8,957.5</b>	<b>46.9%</b>	<b>848</b>	<b>21.5%</b>	<b>\$ 6,949.7</b>	<b>36.4%</b>	<b>578</b>	<b>14.7%</b>	<b>\$3,203.8</b>	<b>16.8%</b>
Transportation	2,468	64.0%	8,836.8	46.9%	829	21.5%	6,844.2	36.3%	562	14.6%	3,166.9	16.8%
Other Utilities	41	56.2%	114.0	46.2%	18	24.7%	105.2	42.6%	14	19.2%	27.7	11.2%
Telecommunications	2	40.0%	6.8	41.5%	1	20.0%	0.3	1.8%	2	40.0%	9.3	56.7%
<b>Education</b>	<b>502</b>	<b>65.2%</b>	<b>\$3,619.3</b>	<b>60.2%</b>	<b>152</b>	<b>19.7%</b>	<b>\$1,351.7</b>	<b>22.5%</b>	<b>116</b>	<b>15.1%</b>	<b>\$1,037.3</b>	<b>17.3%</b>
Post-secondary and Preschools	412	65.0%	2,320.3	55.8%	125	19.7%	1,067.4	25.7%	97	15.3%	772.9	18.6%
New Public School Construction	54	64.3%	1,212.9	69.9%	17	20.2%	269.5	15.5%	13	15.5%	253.9	14.6%
School System-wide Need	36	69.2%	86.0	77.3%	10	19.2%	14.8	13.3%	6	11.5%	10.5	9.4%
<b>Health, Safety, and Welfare</b>	<b>1,248</b>	<b>61.3%</b>	<b>\$4,250.1</b>	<b>57.9%</b>	<b>460</b>	<b>22.6%</b>	<b>\$ 1,419.0</b>	<b>19.3%</b>	<b>327</b>	<b>16.1%</b>	<b>\$1,674.8</b>	<b>22.8%</b>
Water and Wastewater	821	58.2%	2,244.2	51.4%	339	24.0%	909.4	20.8%	251	17.8%	1,210.0	27.7%
Law Enforcement	200	73.3%	1,491.2	76.6%	42	15.4%	327.3	16.8%	31	11.4%	127.8	6.6%
Storm Water	38	48.7%	59.5	17.0%	21	26.9%	58.4	16.6%	19	24.4%	232.9	66.4%
Public Health Facilities	71	74.7%	326.9	73.6%	15	15.8%	48.5	10.9%	9	9.5%	68.6	15.4%
Fire Protection	90	70.3%	96.9	55.1%	28	21.9%	52.2	29.7%	10	7.8%	26.6	15.1%
Solid Waste	27	60.0%	21.3	55.6%	12	26.7%	8.4	21.9%	6	13.3%	8.6	22.4%
Housing	1	20.0%	10.0	39.8%	3	60.0%	14.8	59.0%	1	20.0%	0.3	1.2%
<b>Recreation and Culture</b>	<b>532</b>	<b>60.1%</b>	<b>\$1,008.0</b>	<b>53.8%</b>	<b>236</b>	<b>26.7%</b>	<b>\$ 588.1</b>	<b>31.4%</b>	<b>117</b>	<b>13.2%</b>	<b>277.2</b>	<b>14.8%</b>
Recreation	413	59.8%	567.0	53.5%	181	26.2%	280.4	26.5%	97	14.0%	211.5	20.0%
Community Development	59	67.0%	191.7	46.0%	19	21.6%	185.1	44.4%	10	11.4%	40.4	9.7%
Libraries, Museums, and Historic Sites	60	56.6%	249.3	62.8%	36	34.0%	122.6	30.9%	10	9.4%	25.3	6.4%
<b>Economic Development</b>	<b>93</b>	<b>63.3%</b>	<b>260.2</b>	<b>20.9%</b>	<b>36</b>	<b>24.5%</b>	<b>\$ 63.3</b>	<b>5.1%</b>	<b>18</b>	<b>12.2%</b>	<b>\$ 922.0</b>	<b>74.0%</b>
Business District Development	16	45.7%	47.7	4.8%	10	28.6%	29.0	2.9%	9	25.7%	907.7	92.2%
Industrial Sites and Parks	77	68.8%	212.5	81.4%	26	23.2%	34.3	13.1%	9	8.0%	14.3	5.5%
<b>General Government</b>	<b>134</b>	<b>59.0%</b>	<b>\$ 241.1</b>	<b>52.8%</b>	<b>64</b>	<b>28.2%</b>	<b>\$ 133.8</b>	<b>29.3%</b>	<b>29</b>	<b>12.8%</b>	<b>82.0</b>	<b>18.0%</b>
Public Buildings	115	58.4%	167.9	46.7%	57	28.9%	111.3	31.0%	25	12.7%	80.2	22.3%
Other Facilities	19	63.3%	73.2	75.0%	7	23.3%	22.5	23.1%	4	13.3%	1.9	1.9%
<b>Grand Total</b>	<b>5,020</b>	<b>62.7%</b>	<b>\$18,336.1</b>	<b>50.9%</b>	<b>1,796</b>	<b>22.4%</b>	<b>\$10,505.5</b>	<b>29.2%</b>	<b>1,185</b>	<b>14.8%</b>	<b>\$7,197.1</b>	<b>20.0%</b>

<sup>6</sup> For complete listings of costs by project type, stage of development, and county, see appendix D.

**Conceptual needs still remain at nearly half of the total estimated cost, but needs under construction decreased.**

Inventory needs are also reported by stage of development, or the various phases through which projects progress. These stages include conceptual, planning and design, and construction. Based on analysis described in the chapter on local needs (later in this report),

**Figure 4. Four-Year Comparison Percent of Total Reported Cost of Infrastructure Needs by Stage**

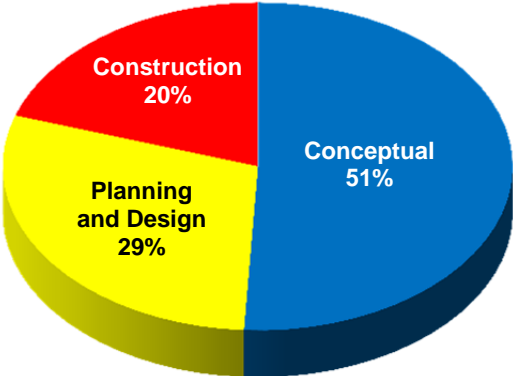


stage of development may vary based on several factors, including taxable property values per capita, taxable sales per capita, population change, and total population. These factors also appear to influence the likelihood that infrastructure needs reported in the inventory will be completed.

Although conceptual needs increased slightly and needs in each of the other two stages decreased by small percentages (see figure 4), the overall distribution of needs by stage has remained relatively consistent over the last four years. Projects in the conceptual stage make up more than half (51%) in dollar terms of this year’s inventory. Those in planning and design account for about 29% of the inventory. Only 20% of the current estimated total cost is for projects that are under construction. See figure 5. The proportion of infrastructure needs under construction increased in two of the six major categories—Economic Development and General Government. The new Nashville convention center, which is currently under construction, makes up most of the needs in the construction phase in the Economic Development category. Despite these increases, needs in the conceptual stage continue to dominate five of the six major categories.

Needs in the Education category remain mostly conceptual because many projects that were under construction in the last inventory have now been completed, and few projects have moved on to construction. Last year, 229 post-secondary and preschool projects were under construction. Currently, only 97 projects of that type are under construction. Needs in the construction phase in the General Government category increased only slightly since the last report. Public buildings continue to comprise the largest portion of these needs.

**Figure 5. Percent of Total Reported Cost of Infrastructure Needs by Stage of Development Five-year Period July 2010 through June 2015**



**State and federal mandates affect 4.4% of all projects, a 0.7% decrease since the last inventory.**

TACIR does not ask local or state officials to identify costs related to state and federal mandates—except for needs at existing schools—because officials reporting their needs often do not have the detailed information necessary to do so (e.g., the cost of ramps and lowered water fountains required by the Americans with Disabilities Act or ADA). They are asked, however, to indicate whether the costs of any projects are affected by mandates. So while it is impossible to determine how much of the estimated total costs are associated with state and federal mandates, we can report that the overall number of projects affected by mandates, such as the federal ADA and fire codes, is a relatively small portion (4.4%) of the total number of projects in the inventory.

Moreover, the number of projects affected by mandates continues to decline. About 15% of projects reported in 2001 included costs related to mandates. The percentage fell to 9% the following year and remained around 5% from 2004 through 2009. Existing school improvements alone account for more than half of the total number of projects affected by mandates. Although they decreased by 43 projects, existing schools are far more likely to be affected by mandates than any other type of project. See table 9.

**Table 9. Percent of Projects Affected by Mandates  
Five-year Period July 2010 through June 2015**

Type of Need	Number of Projects or Schools Reported	Projects or Schools Affected by Mandates	
		Number	Percent
School System-wide Need	52	14	26.9%
Existing School Improvements	1,261	223	17.7%
Public Health Facilities	95	10	10.5%
Post-secondary and Preschools	634	55	8.7%
Public Buildings	197	9	4.6%
Law Enforcement	273	12	4.4%
Solid Waste	45	2	4.4%
New Public School Construction	84	3	3.6%
Recreation	691	21	3.0%
Libraries, Museums, and Historic Sites	106	2	1.9%
Water and Wastewater	1,411	25	1.8%
Storm Water	78	1	1.3%
Transportation	3,859	32	0.8%
Community Development	88	0	0.0%
Fire Protection	128	0	0.0%
Housing	5	0	0.0%
Business District Development	35	0	0.0%
Industrial Sites and Parks	112	0	0.0%
Other Facilities	30	0	0.0%
Other Utilities	73	0	0.0%
Telecommunications	5	0	0.0%
<b>Grand Total</b>	<b>9,262</b>	<b>409</b>	<b>4.4%</b>

# Building Tennessee's Tomorrow: Anticipating the State's Infrastructure Needs

*July 2010 through June 2015*

## Funding the State's Infrastructure Needs

***Nearly two thirds of infrastructure needs in the current inventory are not fully funded.***

Information about the availability of funding to meet Tennessee's public infrastructure needs indicates that 62% of the funding needed is not yet available. This percentage is about the same as last year. The inventory does not include information about the availability of funds to meet needs at existing schools or those drawn from the capital budget requests submitted by state agencies. Excluding those needs from the total of \$38 billion reported for the period covered by the inventory leaves \$29.5 billion in needs. Of this remaining amount, only \$10.7 billion is for projects that are fully funded; another \$423 million is for needs that are partially funded. That leaves \$18.4 billion of needs for which funding is not yet available. See table 10.

**Table 10. Summary of Funding Availability  
Five-year Period July 2010 through June 2015**

	Funding Available [in billions]	Funding Needed [in billions]	Total* [in billions]
Fully Funded Needs	\$10.7	\$0	\$10.7
Partially Funded Needs	0.4	3.5	4.0
Unfunded Needs	0.0	14.9	14.9
<b>Total</b>	<b>\$11.1</b>	<b>\$18.4</b>	<b>\$29.5</b>

\*Excludes amounts for which availability of funds is unknown.

Table 11 on the following page takes the \$10.7 billion available for fully funded needs and breaks it down by type of infrastructure, and then compares it with the total needed for each type. The resulting percentages vary. Although transportation and water and wastewater represent the largest portion of needs, they are not the most fully funded. That would be business district development at 94%. The new convention center in Nashville accounts for 72% (\$704 million) of the estimated cost of all business district development needs and is fully funded. If this project were not in the current inventory, the percentage of business district development needs that are fully funded would drop to 79.1% but would still be the highest.

Next after business district development comes storm water at 67.5% and public housing at 60.2%. A \$129 million project to improve and expand an existing drainage system in Shelby County accounts for over half of the funding for storm water needs. Without this project, the percentage of storm water funding needs would be 30.8%. Of the five public housing projects in the current inventory, four with a total cost of \$15.1 million are fully funded. These projects will rehabilitate or build public housing in Carter, Grundy, Scott, and Shelby counties. Telecommunications, while small overall, is 58.5% funded, making it the fourth most fully funded type.

**Table 11. Percent of Needs Fully Funded by Type of Need**  
**Five-year Period July 2010 through June 2015**

<b>Category and Project Type</b>	<b>Total Needs [in millions]*</b>	<b>Fully Funded Needs [in millions]</b>	<b>Percent of Total Needs</b>
<b>Transportation and Utilities</b>	<b>\$19,053.1</b>	<b>\$6,554.3</b>	<b>34.4%</b>
Transportation	18,789.9	6,489.4	34.5%
Other Utilities	246.8	55.3	22.4%
Telecommunications	16.4	9.6	58.5%
<b>Health, Safety, and Welfare</b>	<b>\$5,605.1</b>	<b>\$2,207.2</b>	<b>39.4%</b>
Water and Wastewater	4,363.6	1,714.5	39.3%
Law Enforcement	614.9	180.1	29.3%
Storm Water	350.3	236.5	67.5%
Solid Waste	38.3	11.9	31.0%
Fire Protection	175.2	42.6	24.3%
Public Health Facilities	37.7	6.6	17.4%
Housing	25.1	15.1	60.2%
<b>Education</b>	<b>\$1,775.6</b>	<b>\$430.4</b>	<b>24.2%</b>
New Public School Construction	1,736.3	428.6	24.7%
Post-secondary Education and Preschool**	14.7	1.3	8.9%
School System-wide Need	24.6	0.5	2.0%
<b>Recreation and Culture</b>	<b>\$1,430.1</b>	<b>\$405.5</b>	<b>28.4%</b>
Recreation	834.1	286.6	34.4%
Libraries, Museums, and Historic Sites	178.9	29.7	16.6%
Community Development	417.1	89.2	21.4%
<b>Economic Development</b>	<b>\$1,245.4</b>	<b>\$954.9</b>	<b>76.7%</b>
Business District Development	984.4	925.8	94.0%
Industrial Sites and Parks	261.0	29.0	11.1%
<b>General Government</b>	<b>\$380.2</b>	<b>\$112.8</b>	<b>29.7%</b>
Public Buildings	296.2	111.1	37.5%
Other Facilities	83.9	1.7	2.0%
<b>Grand Total</b>	<b>\$29,489.5</b>	<b>\$10,665.1</b>	<b>36.2%</b>

\*Excludes needs for which availability of funds is unknown.

\*\*Includes pre-schools, vocational training facilities, and higher education centers owned by city or county governments and excludes needs reported for the state's colleges and universities.

Public buildings and recreation are next in percent of needs fully funded at 37.5% and 34.4% respectively. More than one-quarter of the recreation total is for an \$82 million park improvement<sup>1</sup> project in Davidson County. Solid waste ranks 9<sup>th</sup> in percent of needs fully funded (31.0%), though total need for this type of infrastructure is just \$38.3 million. Law enforcement rounds out the top ten with 29.3% of the \$614.9 million needed being fully funded.

While new public school construction is third in total infrastructure needs, it ranks 11<sup>th</sup> in percent fully funded at 24.7%. School systems in Tennessee are not fiscally independent, which may hamper school officials' abilities to project funding and may at least partially account for the low percentages in table 11.

<sup>1</sup> This project is for multiple parks in Davidson County.



Two other types of infrastructure, community development and other utilities, rank among the top 10 for total needs but have a lower percent fully funded. Community development ranks 7<sup>th</sup> in total infrastructure needs, and other utilities ranks 10<sup>th</sup>. Only 21.4% of the infrastructure needed to support community development is fully funded; three projects comprise all of the funding. Two of these involve building community centers, one in Pigeon Forge (Sevier County) for \$30 million and another in Johnson City (Washington County) for \$15 million. The third project is the Beale Street Landing in Memphis (Shelby County) for \$35 million. Overall, 22.4% of the infrastructure needed for other utilities is fully funded. See table 11.

***State funding increased, federal funding declined, and local funding stayed about the same as last year.***

While state revenue sources for fully funded infrastructure increased since last year, local sources, which consist of city, county, and special district revenues, remained about the same as last year and continue to be the principal source of funding for fully funded infrastructure. County sources increased by \$329 million, but that increase was partially offset by a decrease in city funding (\$293 million). Federal funding fell by \$120 million, most of which was for transportation infrastructure. Funding from state sources increased by \$510 million, nearly all of which was for transportation infrastructure and more than offset the decline in federal funds. A large amount of this funding is for projects that were unfunded in previous inventories. Funding from other sources, such as donations from private corporations and individuals, remained about the same as last year. See table 12.

**Table 12. Funding Sources for Fully Funded Public Infrastructure Needs  
Comparison of July 2009 and July 2010 Inventories**

Funding Source	July 2009 Inventory		July 2010 Inventory		Difference
	Amount [billions]	Percent	Amount [billions]	Percent	Amount [billions]
Local	4.3	41.8%	4.3	40.3%	0.0
State	3.3	32.3%	3.8	35.9%	0.5
Federal	2.6	25.3%	2.5	23.4%	-0.1
Other	0.1	0.6%	0.1	0.3%	0.0
<b>Total</b>	<b>10.3</b>	<b>100.0%</b>	<b>10.7</b>	<b>100.0%</b>	<b>0.4</b>

***Funding sources vary by type of infrastructure.***

Local government sources provide the majority of funding for all needs except transportation and public housing. These sources include counties, cities, and special districts. Because this analysis does not include the state's colleges and universities, counties are the only source of funding for post-secondary education and preschools in the inventory. Counties are the principal source of funding for five other types of infrastructure needs: business district development (94.0%); law enforcement (83.6%); new public school construction (77.6%); libraries, museums, and historic sites (61.8%); and solid waste (51.2%). Overall, counties provide funds for 22% of fully funded needs.

Though cities fund just 16.6% of all fully funded infrastructure needs, they contribute heavily to six types of infrastructure: storm water (95.7%), other facilities (93.9%), fire protection (84.5%), other utilities (81.2%), telecommunications (76.6%), and community development (75.6%). And more than 40% of fully funded solid waste, water and wastewater, and recreation infrastructure is funded by cities. Except for solid waste, this constitutes the largest portion of the funding. Counties fund 51.2% of solid waste infrastructure. See table 13.

Even without considering the state's own infrastructure (e.g., colleges and universities), state and federal sources fund 59.3% of all fully funded infrastructure needs. State and federal sources are the largest contributors to infrastructure needs for public housing and transportation, funding more than 90% of each of those types of infrastructure. While transportation is funded by both state (56.7%) and federal (33.5%) sources, public housing is primarily funded by the federal government at 94.7%. Only 3.3% of the funding for public housing is provided by the state. The only other type of need funded mainly by the state and federal governments is school system-wide needs with 40% coming from federal sources and 20% from state sources. Two projects, totaling \$500,000, account for the entire fully funded amount for this type. The federal government provided \$200,000, which the county matched, to install security cameras in Humphrey County schools. The second project received a \$100,000 Energy Efficiency and Conservation Block Grant from the state to update lighting, HVAC, and energy management systems across the Bledsoe County School System. See table 13.

**Table 13. Funding Source by Category and Type of Infrastructure for Fully Funded Needs [in millions]**  
**Five-year Period July 2010 through June 2015**

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
<b>Transportation and Utilities</b>	<b>\$3,677.5</b>	<b>56.1%</b>	<b>\$2,176.5</b>	<b>33.2%</b>	<b>\$7.9</b>	<b>0.1%</b>	<b>\$372.9</b>	<b>5.7%</b>	<b>\$310.6</b>	<b>4.7%</b>	<b>\$8.8</b>	<b>0.1%</b>	<b>\$6,554.3</b>
Transportation	3,676.8	56.7%	2,175.9	33.5%	7.3	0.1%	320.7	4.9%	308.3	4.8%	0.4	0.0%	6,489.4
Other Utilities	0.7	1.2%	0.6	1.1%	0.6	1.1%	44.9	81.2%	0.0	0.0%	8.5	15.3%	55.3
Telecommunications	0.0	0.0%	0.0	0.0%	0.0	0.0%	7.4	76.6%	2.3	23.4%	0.0	0.0%	9.6
<b>Health, Safety, and Welfare</b>	<b>\$98.9</b>	<b>4.5%</b>	<b>\$214.0</b>	<b>9.7%</b>	<b>\$9.1</b>	<b>0.4%</b>	<b>\$1,045.1</b>	<b>47.3%</b>	<b>\$684.9</b>	<b>31.0%</b>	<b>\$155.3</b>	<b>7.0%</b>	<b>\$2,207.2</b>
Water and Wastewater	97.8	5.7%	191.4	11.1%	7.1	0.4%	747.3	43.6%	516.9	30.1%	154.1	9.0%	1,714.5
Law Enforcement	0.0	0.0%	0.1	0.1%	0.0	0.0%	29.4	16.3%	150.5	83.6%	0.0	0.0%	180.1
Storm Water	0.0	0.0%	3.3	1.4%	0.0	0.0%	226.4	95.7%	6.9	2.9%	0.0	0.0%	236.5
Solid Waste	0.1	0.8%	0.0	0.0%	0.0	0.0%	5.7	48.0%	6.1	51.2%	0.0	0.0%	11.9
Fire Protection	0.0	0.0%	2.4	5.6%	0.0	0.0%	36.0	84.5%	2.9	6.9%	1.3	3.0%	42.6
Public Health Facilities	0.5	7.6%	2.6	38.8%	2.0	30.5%	0.0	0.0%	1.5	23.1%	0.0	0.0%	6.6
Housing	0.5	3.3%	14.3	94.7%	0.0	0.0%	0.3	2.0%	0.0	0.0%	0.0	0.0%	15.1
<b>Education</b>	<b>\$2.6</b>	<b>0.6%</b>	<b>\$0.2</b>	<b>0.0%</b>	<b>\$0.0</b>	<b>3.3%</b>	<b>\$56.8</b>	<b>13.2%</b>	<b>\$354.8</b>	<b>82.4%</b>	<b>\$16.0</b>	<b>3.7%</b>	<b>\$430.4</b>
New Public School Construction	2.5	0.6%	0.0	0.0%	0.0	3.3%	56.8	13.3%	353.3	82.4%	16.0	3.7%	428.6
Post-secondary Education and Preschools	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.3	100.0%	0.0	0.0%	1.3
School System-wide Need	0.1	20.0%	0.2	40.0%	0.0	0.0%	0.0	0.0%	0.2	40.0%	0.0	0.0%	0.5
<b>Recreation and Culture</b>	<b>\$22.6</b>	<b>5.6%</b>	<b>\$66.1</b>	<b>16.3%</b>	<b>\$18.5</b>	<b>4.6%</b>	<b>\$184.3</b>	<b>45.5%</b>	<b>\$110.7</b>	<b>27.3%</b>	<b>\$3.2</b>	<b>0.8%</b>	<b>\$405.5</b>
Recreation	15.5	5.4%	47.3	16.5%	15.3	5.4%	115.6	40.3%	89.7	31.3%	3.2	1.1%	286.6
Libraries, Museums, and Historic Sites	1.7	5.8%	8.2	27.7%	0.0	0.0%	1.4	4.7%	18.3	61.8%	0.0	0.0%	29.7
Community Development	5.3	6.0%	10.6	11.9%	3.2	3.6%	67.4	75.6%	2.7	3.0%	0.0	0.0%	89.2
<b>Economic Development</b>	<b>\$13.7</b>	<b>1.4%</b>	<b>\$15.5</b>	<b>1.6%</b>	<b>\$0.6</b>	<b>0.1%</b>	<b>\$42.4</b>	<b>4.4%</b>	<b>\$878.1</b>	<b>92.0%</b>	<b>\$4.4</b>	<b>0.5%</b>	<b>\$954.9</b>
Business District Development	9.9	1.1%	5.7	0.6%	0.0	0.0%	39.6	4.3%	870.6	94.0%	0.0	0.0%	925.8
Industrial Sites and Parks	3.8	13.1%	9.9	34.0%	0.6	2.2%	2.8	9.7%	7.5	25.8%	4.4	15.2%	29.0
<b>General Government</b>	<b>\$9.3</b>	<b>8.2%</b>	<b>\$1.0</b>	<b>0.9%</b>	<b>\$0.1</b>	<b>0.1%</b>	<b>\$71.0</b>	<b>63.0%</b>	<b>\$30.6</b>	<b>27.2%</b>	<b>\$0.8</b>	<b>0.7%</b>	<b>\$112.8</b>
Public Buildings	9.2	8.3%	1.0	0.9%	0.1	0.1%	69.5	62.5%	30.6	27.6%	0.8	0.7%	111.1
Other Facilities	0.1	6.1%	0.0	0.0%	0.0	0.0%	1.6	93.9%	0.0	0.0%	0.0	0.0%	1.7
<b>Grand Total</b>	<b>\$3,824.5</b>	<b>35.9%</b>	<b>\$2,473.1</b>	<b>23.2%</b>	<b>\$36.3</b>	<b>0.3%</b>	<b>\$1,772.6</b>	<b>16.6%</b>	<b>\$2,369.8</b>	<b>22.2%</b>	<b>\$188.5</b>	<b>1.8%</b>	<b>\$10,665.1</b>

**Overall, \$14.9 billion of infrastructure needs are not yet funded.**

Overall, unfunded needs comprise about half (50.4%) of total estimated costs. At least two-thirds of six types of infrastructure have no funding—other facilities (95.9%), school system-wide needs (97.2%), industrial sites and parks (79%), community development (73.5%), other utilities (67.7%), and new public school construction (66.6%). See table 14.

**Table 14. Percent of Needs with no Funding Reported by Type of Need  
Five-year Period July 2010 through June 2015**

<b>Category and Project Type</b>	<b>Total Needs* [in millions]</b>	<b>Needs with No Funding [in millions]</b>	<b>Percent of Total Needs</b>
<b>Transportation and Utilities</b>	<b>\$19,053.1</b>	<b>\$9,764.2</b>	<b>51.2%</b>
Transportation	18,789.9	9,590.2	51.0%
Other Utilities	246.8	167.2	67.7%
Telecommunications	16.4	6.8	41.5%
<b>Health, Safety, and Welfare</b>	<b>\$5,605.1</b>	<b>\$2,661.5</b>	<b>47.5%</b>
Water and Wastewater	4,363.6	2,190.0	50.2%
Law Enforcement	614.9	272.0	44.2%
Storm Water	350.3	62.3	17.8%
Solid Waste	38.3	21.3	55.6%
Fire Protection	175.2	95.4	54.4%
Public Health Facilities	37.7	10.4	27.7%
Housing	25.1	10.0	39.8%
<b>Education</b>	<b>\$1,775.6</b>	<b>\$1,187.5</b>	<b>66.9%</b>
New Public School Construction	1,736.3	1,156.2	66.6%
Post-secondary Education and Preschools**	14.7	7.4	50.3%
School System-wide Need	24.6	24.0	97.2%
<b>Recreation and Culture</b>	<b>\$1,430.1</b>	<b>\$775.6</b>	<b>54.2%</b>
Recreation	834.1	361.4	43.3%
Libraries, Museums, and Historic Sites	178.9	107.8	60.3%
Community Development	417.1	306.4	73.5%
<b>Economic Development</b>	<b>\$1,245.4</b>	<b>\$253.3</b>	<b>20.3%</b>
Business District Development	984.4	47.2	4.8%
Industrial Sites and Parks	261.0	206.1	79.0%
<b>General Government</b>	<b>\$380.2</b>	<b>\$210.3</b>	<b>55.3%</b>
Public Buildings	296.2	129.8	43.8%
Other Facilities	83.9	80.5	95.9%
<b>Grand Total</b>	<b>\$29,489.5</b>	<b>\$14,852.4</b>	<b>50.4%</b>

\*Excludes needs for which availability of funds is unknown.

\*\*Includes pre-schools, vocational training facilities, and higher education centers owned by city or county governments and excludes needs reported for the state's colleges and universities.

# Building Tennessee's Tomorrow: Anticipating the State's Infrastructure Needs

*July 2010 through June 2015*

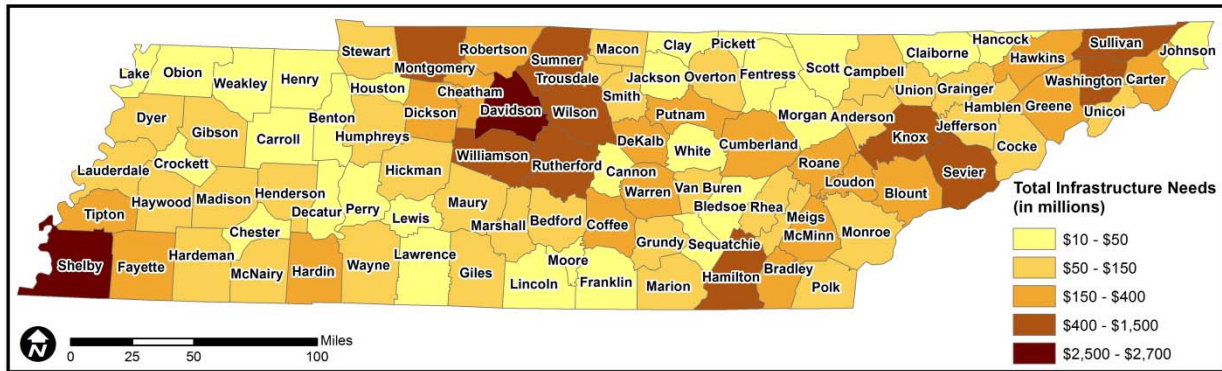
## INFRASTRUCTURE NEEDS BY COUNTY

*Infrastructure needs vary widely across Tennessee's counties.*

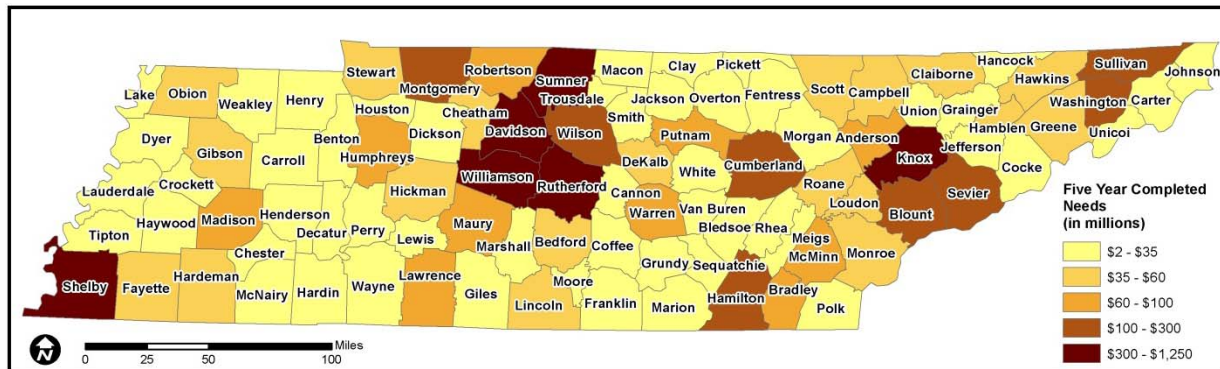
Infrastructure needs and the ability to meet them vary across Tennessee. It is no surprise that counties with the greatest populations, growth rates, and tax bases need the most infrastructure and are able to build the most. Shelby, with the greatest population, and Davidson, with the second greatest population and greatest density, need a lot and get a lot done. Knox needs more than most and relatively speaking gets even more done, as do Rutherford, Sumner, and Williamson. Other populous counties—Hamilton, Montgomery, Sevier, Sullivan, Washington, and Wilson—need more and build more than the rest of the state. Madison is the exception; it has average needs but gets less done. See maps 1 and 2.

It is not clear from these maps what is driving infrastructure needs in the other 82 counties. For example, Carter, Coffee, Dickson, Hardin, and Tipton have middling needs, but complete much less than average. In contrast, Lawrence has low needs, but falls in the middle for meeting its needs.

**Map 1. Estimated Cost of Total Infrastructure Needs**  
*Five Year Period July 2010 through June 2015*

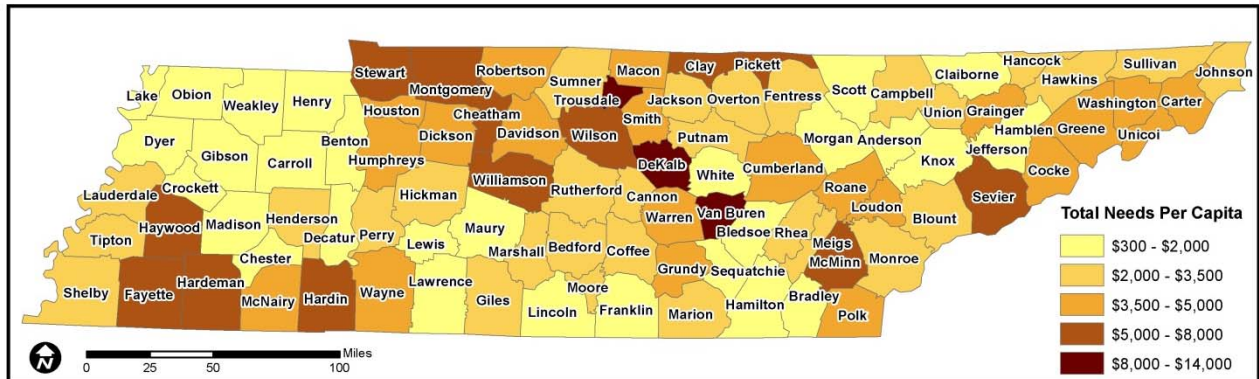


**Map 2. Completed Infrastructure Needs**  
*Fiscal Years 2007 through 2011*

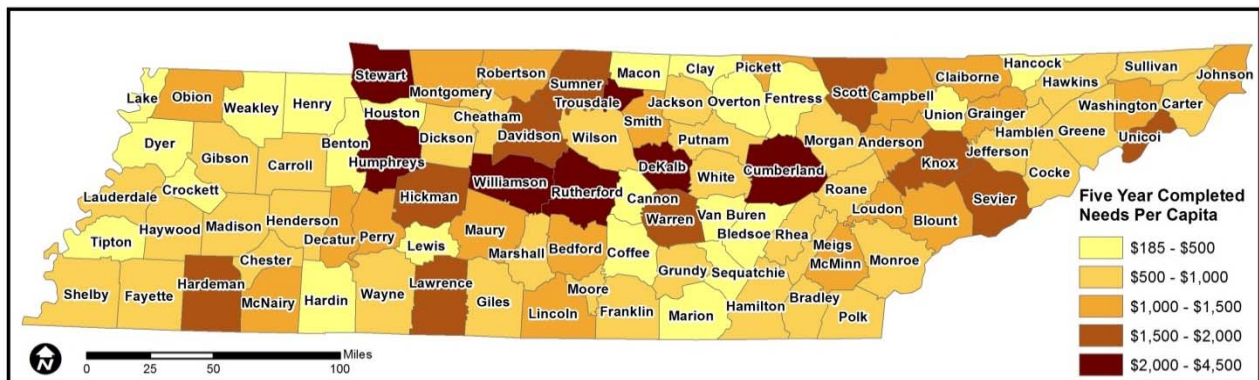


To help us gain insight into these differences, we looked at infrastructure needs relative to population and geographic area and came up with some surprising results. When examining needs and completion per capita, it is not clear that population is driving the differences. For instance, the most populous counties do not have the most infrastructure needs per capita, and they do not necessarily get the most done. And counties with much smaller populations, like DeKalb, Trousdale, and Van Buren, have the greatest needs per capita; however, while DeKalb and Trousdale appear to be able to meet their needs, Van Buren does not. See maps 3 and 4.

**Map 3. Total Needs Per Capita**  
*Five Year Period July 2010 through June 2015*



**Map 4. Completed Infrastructure Needs Per Capita**  
*Fiscal Years 2007 through 2011*



Since population alone does not seem to explain the variation, we looked at other factors. Because Tennessee’s 95 counties vary so much in size—for instance, “Big Shelby” at 755 square miles, is almost seven times the size of Trousdale, which is only 114 square miles—we divided by square miles to make sure that land area did not distort the analysis.

So what factors might explain the variation that size does not? Likely candidates include population growth and wealth. Wealth in this instance means revenue sources for local governments and residents’ ability to pay taxes based on their income. Analyzing these factors using a common statistical technique called regression produced the following conclusions:

- Population still matters, but population gain matters more.
- When it comes to driving need, income matters most of all.

- And when it comes to meeting those needs, while population gain matters most, taxable sales come second.

***Both population and wealth factors are strongly tied to infrastructure needs and the ability to meet them.***

Statistical analysis can suggest explanations for things that general observation cannot. A simple statistical method is measuring correlations. Correlation coefficients measure the strength of the relationship between two sets of numbers. The strength is reported as a range from zero to one. The coefficient will be positive if one set of numbers increases as the other increases, or decreases as the other decreases; it will be negative if one increases as the other decreases.

When looked at in isolation, four factors stand out, both in relation to need and to the ability to meet needs. Wealth factors come first, then population. Population gain comes next, but growth rates are only weakly correlated. See tables 15 and 16.

**Table 15. Correlation Between Reported Infrastructure Needs and Related Factors**

Factor	Correlation t reported needs per square mile
Taxable Property Value	0.93
Income	0.93
Taxable Sales	0.91
Population	0.91
Population Gain or Loss	0.76
Population Growth Rate	0.24

Note: All variables were divided by land area.

**Table 16. Correlation Between Completed Infrastructure Needs and Related Factors**

Factor	Correlation with completed needs per square mile
Taxable Sales	0.94
Taxable Property Value	0.94
Income	0.91
Population	0.90
Population Gain or Loss	0.83
Population Growth Rate	0.20

Note: All variables were divided by land area.

***Income and population factors in combination play the strongest role in explaining infrastructure needs.***

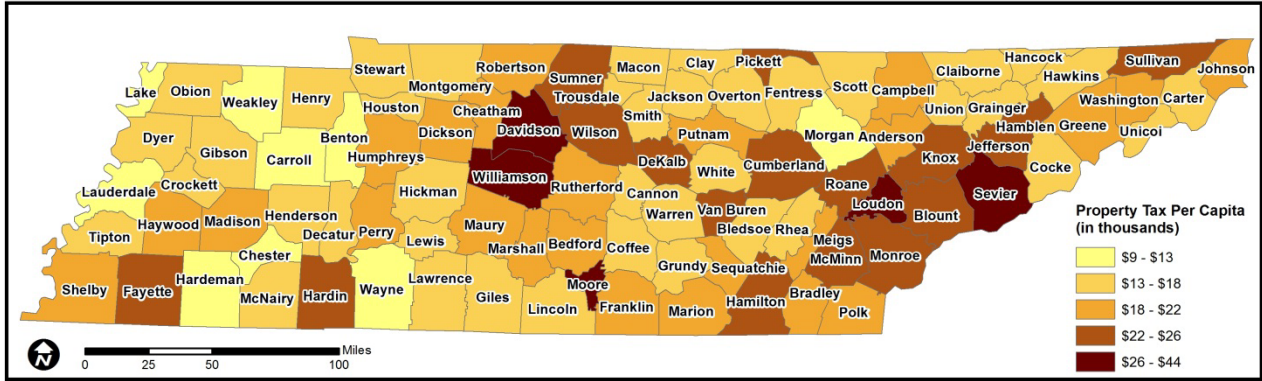
While correlation allows comparison of two factors at a time, regression analysis allows you to compare a group of factors. Using regression analysis, we found that income was the most significant factor in explaining infrastructure needs, followed by population gain and total population. Taxable property values were also significant but taxable sales were not. See table 17. The contrast between taxable property and sales lies in the difference in how they are distributed across Tennessee’s 95 counties. Taxable sales are much more concentrated. See maps 5 and 6.

**Table 17. Significance of Factors Affecting Infrastructure Needs**

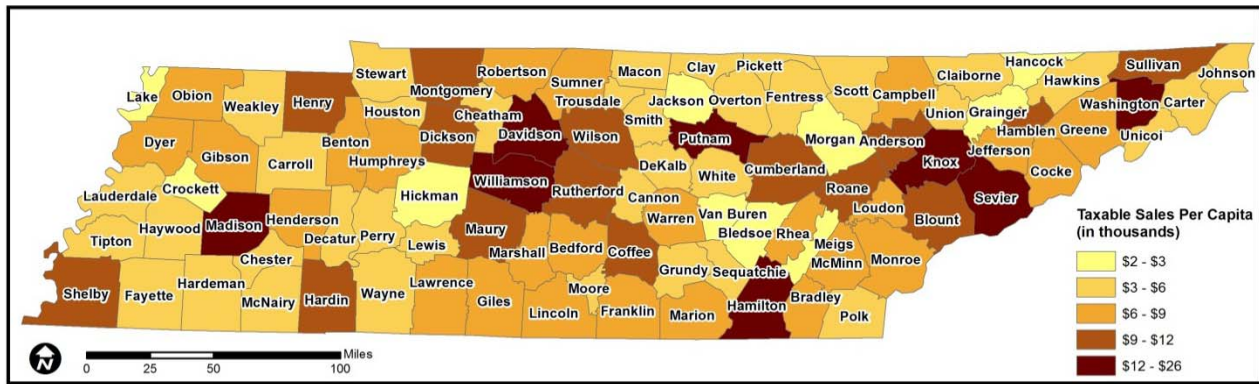
Statistical Significance	Factors In Order of Significance				
	Income	Population Gain or Loss	Population	Taxable Property	Taxable Sales
Highly Significant	X	X	X		
Significant				X	
Not Significant					X

Note: All variables were divided by land area.

**Map 5. Three-Year Average Property Tax Per Capita**  
*Fiscal Years 2007 through 2009*



**Map 6. Three Year Average Taxable Sales Per Capita**  
*Fiscal Years 2008 through 2010*



***While taxable sales play a small role in driving infrastructure needs, it is second only to population gain in explaining where these needs are met.***

Population gain was the most significant factor in explaining a county’s ability to meet its infrastructure needs. Taxable sales, population, and income followed in order of decreasing significance. In contrast to needs, taxable property is not at all significant to completing infrastructure needs. See table 18. The significance of taxable sales can be explained by people and businesses shopping in a county other than the one in which they live or are located. In doing so, they contribute to the destination county’s ability to meet its needs rather than to their own.

**Table 18. Significance of Factors Affecting Completed Infrastructure Needs**

Statistical Significance	Factors in Order of Significance				
	Population Gain or Loss	Taxable Sales	Population	Income	Taxable Property
Highly Significant	X	X	X	X	
Significant					
Not Significant					X

Note: All variables were divided by land area.



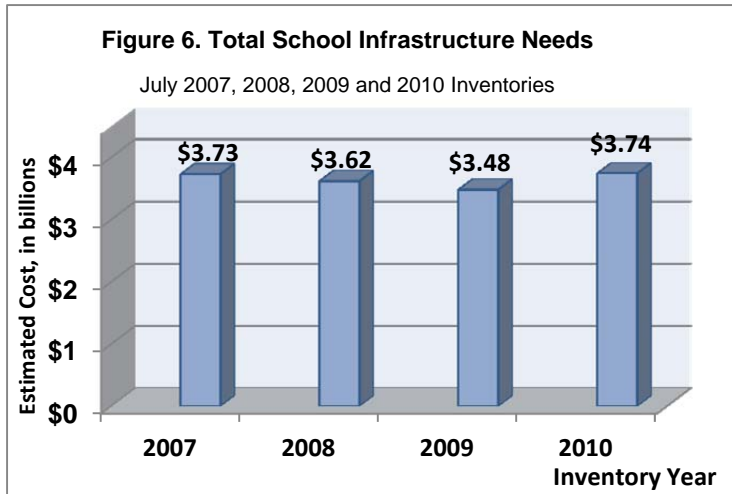
# Building Tennessee's Tomorrow:

## Anticipating the State's Infrastructure Needs

July 2010 through June 2015

### School Infrastructure Needs Increase After Two Years of Decline<sup>1</sup>

The estimated costs for public school infrastructure improvements that need to be started or completed during the five-year period of July 2010 to June 2015 is \$3.7 billion, an increase of \$262 million (7.5%) over the previous inventory. Estimated costs in the current inventory reflect the first increase since the 2007 inventory, but are just \$15 million more than those reported in the 2007 inventory. See figure 6. Total school infrastructure needs are at their highest point since TACIR began the inventory.



This year's increase is driven both by the need to renovate old schools and the need to build new ones. Reported needs for new public schools in the 2010 inventory are the highest in recent years and reflect an increase of 17.7% over last year's inventory, corresponding with the first acceleration in enrollment growth over the past several years. Renovation needs in the current inventory increased 12.8% over the previous inventory and are driven primarily by estimates reported by the most populous counties. See table 19.

**Table 19. Change in School Infrastructure Needs by Type of Need**  
July 2009 Inventory Compared to July 2010 Inventory

Type of Need	July 2009 Inventory	July 2010 Inventory	Difference	Percent Change
<b>New School Space</b>	<b>\$1,622,276,035</b>	<b>\$1,855,701,460</b>	<b>\$233,425,425</b>	<b>14.4%</b>
New Schools	1,245,814,021	1,466,121,981	220,307,960	17.7%
Additions	376,462,014	389,579,479	13,117,465	3.5%
<b>Improvements to Existing Schools</b>	<b>\$1,831,722,766</b>	<b>\$1,862,279,006</b>	<b>\$ 30,556,240</b>	<b>1.7%</b>
Renovations	1,161,934,126	1,310,850,359	148,916,233	12.8%
Replacement Schools	302,234,400	270,200,446	(32,033,954)	-10.6%
Technology	232,817,364	178,788,288	(54,029,076)	-23.2%
Mandates	134,736,876	102,439,913	(32,296,963)	-24.0%
<b>System-wide Needs</b>	<b>\$ 26,382,000</b>	<b>\$ 24,632,000</b>	<b>\$ (1,750,000)</b>	<b>-6.6%</b>
<b>Statewide Total</b>	<b>\$3,480,380,801</b>	<b>\$3,742,612,466</b>	<b>\$262,231,665</b>	<b>7.5%</b>

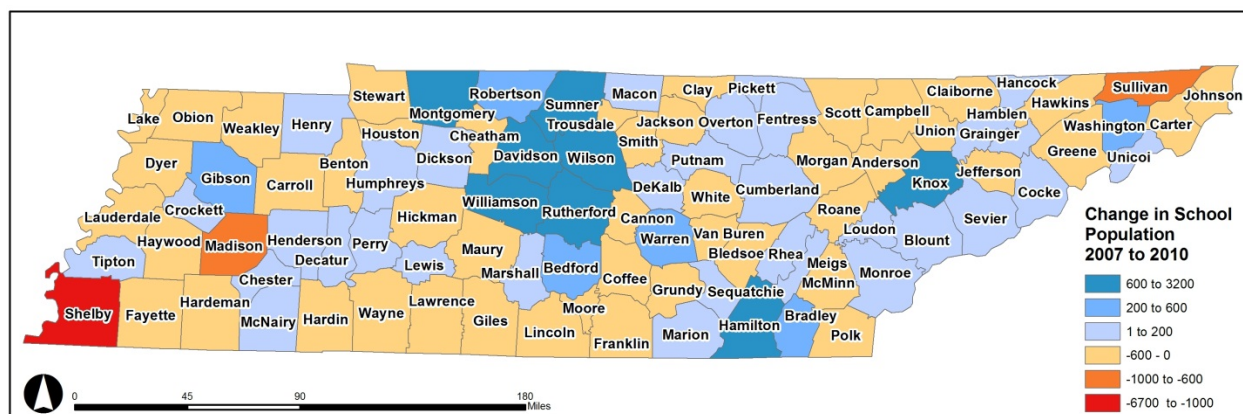
<sup>1</sup> This section of the report covers only local public school systems. It does not include the state's special schools (like the Tennessee School for the Deaf). Therefore, totals presented here will not match totals elsewhere in the report.

## ***New space alone accounts for more than 90% of the increase in school infrastructure needs.***

Increases in the need for school space, including both new schools and additions to existing schools, dominated the growth in school infrastructure needs with a \$233 million (14.4%) increase since the last inventory. Among systems reporting a need for additions, the average estimated cost is \$1.9 million compared to \$1.8 million in last year's inventory. By contrast, the average cost of building a new school is \$20.7 million, up from \$18.2 million in the 2009 inventory. See table 18. A few systems report estimates for new schools that are significantly above average and thus affect the overall increase in new space needs. These include \$90 million for a new high school in Wilson County; two new high schools in Montgomery County estimated to cost \$90 million and \$57 million; and \$56.5 million for a new high school in Shelby County.

As has been seen in past inventories, enrollment growth drives new school space needs,<sup>2</sup> and this trend continues in the current inventory. Enrollment grew unevenly across the state, with some systems experiencing rapid growth and others losing students. Map 7 shows the change in enrollment for each county area from 2007 through 2010.

**Map 7. Enrollment Growth by County Area 2007 through 2010**



There were some differences among systems in the same county, though it was only extreme in the case of Memphis and Shelby County. Memphis lost more students (8,002) than any other system by far, while Shelby County was one of the top ten in enrollment growth, gaining 1,337 students over the three-year period. When combined, Shelby County's growth was completely overshadowed by Memphis' loss.

### **Northern Middle Tennessee has both the greatest enrollment growth and the greatest need for new space.**

The most rapid enrollment growth is concentrated in northern Middle Tennessee. Consistent with past inventories, the systems with the most growth tend to need the most new space. Six of the ten school systems that grew the most are in northern Middle Tennessee; among them, they accounted for 55% of enrollment growth statewide between 2007 and 2010 with a combined increase of 10,894 students. The remaining four systems are evenly split between

<sup>2</sup> This relationship was discussed in the context of slow enrollment growth in last year's infrastructure report. See Green, Harry A., et. al. 2011. *Building Tennessee's tomorrow: Anticipating the state's infrastructure needs*, p. 38.

East and West Tennessee with Knox (5<sup>th</sup>) and Hamilton (9<sup>th</sup>) in East Tennessee accounting for 10% of enrollment growth with 1,976 new students, and Shelby (4<sup>th</sup>) and the Gibson County Special School District (10<sup>th</sup>) in West Tennessee accounting for just over 9% with 1,835 new students. See table 20.

**Table 20. Reported New Space Needs<sup>3</sup> for the Ten School Systems with the Largest Enrollment Growth for 2010, in millions**  
2007 and 2010 Inventories Compared

School System	New Space Needs				Number of Students			
	2007 Estimated Cost	2007 Rank	2010 Estimated Cost	2010 Rank	2007	2010	2007-10 Change	Percent of Total Growth
Williamson County	\$ 252.3	1	\$ 209.9	2	27,301	30,517	3,216	16.2%
Rutherford County	112.4	4	70.0	6	34,384	37,238	2,854	14.4%
Davidson County	70.3	7	34.5	13	72,004	73,447	1,443	7.3%
Shelby County	0.1	73	65.0	8	46,555	47,892	1,337	6.7%
Knox County	75.3	6	0.6	71	54,215	55,521	1,306	6.6%
Montgomery County	181.1	2	263.0	1	27,449	28,661	1,212	6.1%
Sumner County	114.4	3	24.0	19	25,872	27,032	1,160	5.8%
Wilson County	75.4	5	207.4	3	14,048	15,057	1,009	5.1%
Hamilton County	12.0	36	-	80	40,007	40,677	670	3.4%
Gibson County SSD	16.0	28	7.4	35	2,910	3,458	548	2.8%
<b>Top Ten Total</b>	<b>\$ 967.5</b>		<b>\$ 1,026.0</b>		<b>290,635</b>	<b>341,423</b>	<b>14,755</b>	<b>74.3%</b>
<b>Top Ten Percent of Total</b>	<b>53.5%</b>		<b>56.1%</b>		<b>49.6%</b>	<b>56.4%</b>	<b>74.3%</b>	
<b>Subtotal for 69 Systems that Gained Students</b>	<b>\$ 1,491.6</b>		<b>\$ 1,555.0</b>		<b>585,976</b>	<b>605,848</b>	<b>19,872</b>	<b>100.0%</b>
<b>Subtotal for 67 Systems that had No Change or Lost Students</b>	<b>\$ 316.3</b>		<b>\$ 272.7</b>		<b>357,172</b>	<b>342,659</b>	<b>(14,513)</b>	
<b>Grand Total</b>	<b>\$ 1,807.9</b>		<b>\$ 1,827.7</b>		<b>943,149</b>	<b>948,508</b>	<b>5,359</b>	

The 69 systems that gained students over the three-year period saw enrollment increase by a total of 19,872 students. The top ten make up almost 75% of enrollment growth among systems that gained students over the three-year period. Enrollment declined in 67 systems over the same period, led by Memphis City (losing 8,002 students), Madison County (losing 975 students), and Sullivan County (losing 602 students).<sup>4</sup>

Other than the Gibson County Special School District, all of the ten systems with the most growth are in Metropolitan Statistical Areas (MSAs) as defined by the U.S. Census Bureau.<sup>5</sup> In Gibson County, the growth has occurred primarily in the Medina area, which is developing as a suburb of Jackson. According to Gibson County Special School District's director of schools,

<sup>3</sup> The table does not include renovations or new school construction intended to replace an old school rather than to add space.

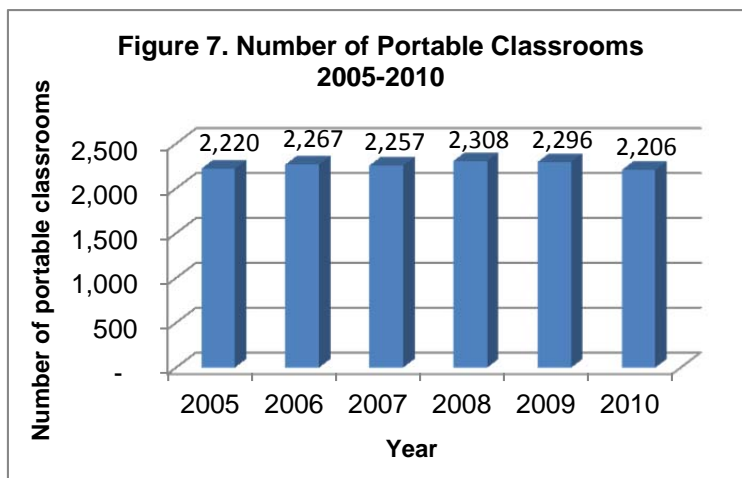
<sup>4</sup> Enrollment is Average Daily Membership as reported by the Tennessee Department of Education in table 7 of the Annual Statistical Report. This data is available on the department's website for 2005 to 2011 at [http://www.tn.gov/education/asr/10\\_11/index.shtml](http://www.tn.gov/education/asr/10_11/index.shtml)

<sup>5</sup> The Center for Business and Economic Research at the University of Tennessee at Knoxville tracks the Census Bureau's Metropolitan Statistical Area designations at <http://cber.bus.utk.edu/census/tnmsadef.htm>

Dr. Eddie Pruet, Medina is just 15 miles from Jackson and most of the families who live there work in Jackson.<sup>6</sup>

**The number of portable classrooms declined in the current inventory but is fairly stable over time.**

Portable classrooms can provide temporary space for fast-growing school systems while they plan more permanent solutions or deal with a sudden space shortage such as after a natural disaster. Overall, 3.1% of Tennessee classrooms are portable. The number of portable classrooms declined in the last inventory, and that trend has continued. This year's inventory has a total of 2,206 portable classroom, 90 fewer than the last year's inventory. See figure 7. The largest declines were in Williamson County (32), Hardin County (25), Shelby County (15), and Davidson County (13). Three of these four systems are among the ten systems with the largest enrollment growth discussed above (see table 19).



Williamson and Davidson counties' situations are fairly straightforward. Each added new schools and subsequently increased the overall number of classrooms while taking portables out of use. Williamson County added three schools and a net total of 137 additional classrooms. Davidson County added one new school and a net total of 88 classrooms. Hardin County consolidated its five elementary schools into two new elementary schools; its declining portable use coincided with the opening of these schools. The system ended with a net loss of three schools but a net gain of 11 classrooms. Shelby County had a similar situation, opening a new elementary school, E.A. Harrold, and transferring Chimneyrock Elementary to the Memphis system. The net increase in classrooms for Shelby County was 138.

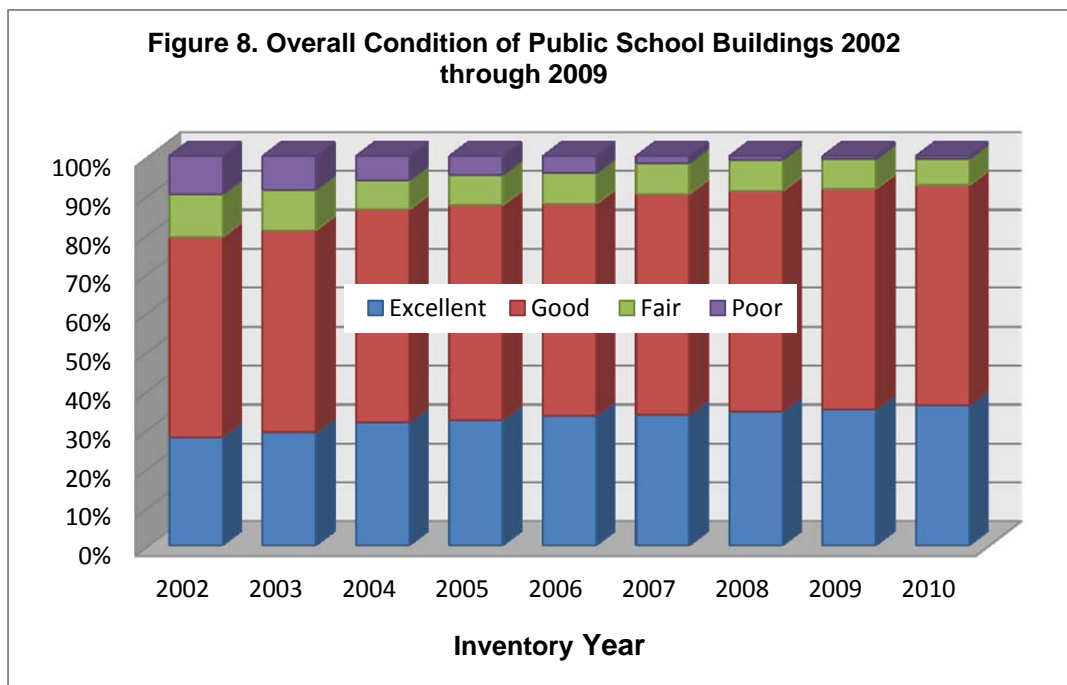
A number of school systems maintain a fairly stable count of portable classrooms over time, suggesting that some portables are being used as permanent solutions to address needs for additional space or to replace space that needs renovation. Four systems reported that more than 10% of their total classrooms are portables, yet two of them—Clay County and the Bradford Special School District in Gibson County—reported no need for new school space. A third—Cannon County—reported a need of only \$82,500 for additions. The fourth—Jefferson County—is the only system that reported a large need for new space, listing \$40 million for two new middle schools to alleviate overcrowding in the system. The need for these two middle schools has been reported in the inventory since 2004, and both schools remain in the conceptual phase.

***The number of schools rated good or excellent remains high.***

In each inventory, school systems rate the condition of their existing schools as “excellent,” “good,” “fair,” or “poor.”<sup>7</sup> As figure 8 on the next page shows, the number of Tennessee’s public

<sup>6</sup> Telephone interview on June 4, 2012.

school buildings in good or better condition has been high for several years, and a very small percentage are in fair or poor condition. The number of schools rated excellent increased from 608 to 629 compared to the 2009 inventory. Likewise, the number rated good increased from 985 to 988. The number fair or poor decreased by 3 compared to last year's inventory. The number of schools in poor condition declined from 14 to 13, and the number in fair condition declined from 119 to 117.<sup>8</sup> Prescott Central Middle School in Putnam County is the only school no longer rated in poor condition compared to last year's inventory. It was replaced with a new school building.



**Schools in fair or poor condition tend to be in more urban areas.**

Exactly half of the school buildings that are rated fair or poor are located in just two counties: Knox (36) and Davidson (29). Only nine other school systems have more than one school rated fair or poor: Hamilton (10), Sullivan (10), Bradley (7), Coffee (5), Grundy (5), Marion (3), Montgomery (2), Shelby (2), and Washington (2) counties. This distribution is partly explained by the fact that more schools are located in urban areas than in rural ones. Nonetheless, some rural areas have a higher percentage of schools in fair or poor condition. In Knox County, 41% of the school buildings are rated fair or poor, though this is not the highest percentage in the state. Grundy County rates 5 of its 8 schools (63%) as fair or poor. Davidson County ranks 7th in the percentage of its schools that are rated fair or poor, behind Grundy, Knox, Lake, Marion, Coffee, and Bradley counties. See table 21.

<sup>7</sup> These condition ratings are defined in appendix C.

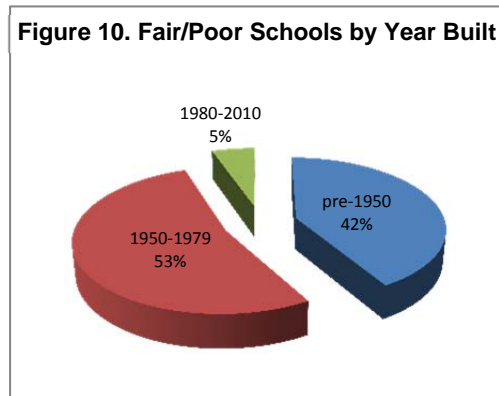
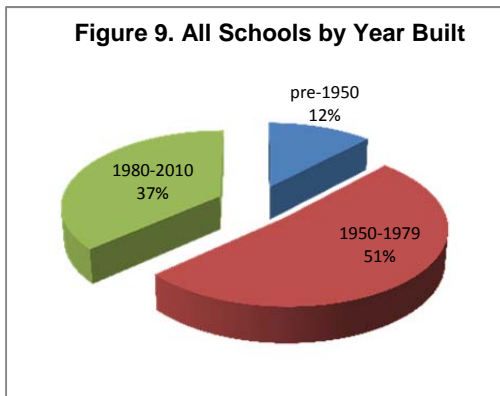
<sup>8</sup> The 2009 inventory listed 138 schools in fair condition, but 19 of those were reclassified as good or excellent after publication.

**Table 21. Renovation and Replacement Needs for the Ten Systems with the Highest Percentage of Schools in Fair or Poor Condition**  
*Five-year Period July 2010 through June 2015*

<b>System</b>	<b>Number Fair/Poor</b>	<b>Total Number of Schools</b>	<b>Percent Fair/Poor</b>	<b>Total Renovation and Replacement Needs</b>	<b>Percent of State Renovation and Replacement Needs</b>
Grundy County	5	8	62.5%	\$ 6,765,000	0.4%
Knox County	36	87	41.4%	96,629,051	6.1%
Lake County	1	3	33.3%	11,317,200	0.7%
Marion County	3	11	27.3%	10,135,000	0.6%
Coffee County	5	19	26.3%	51,401,200	3.3%
Bradley County	7	27	25.9%	20,927,000	1.3%
Davidson County	29	132	22.0%	398,863,000	25.2%
Sullivan County	10	47	21.3%	78,177,139	4.9%
DeKalb County	1	6	16.7%	1,878,000	0.1%
Polk County	1	6	16.7%	2,125,000	0.1%
<b>Total</b>	<b>98</b>	<b>346</b>	<b>7%</b>	<b>\$ 678,217,590</b>	<b>42.9%</b>

**Schools in fair or poor condition tend to be older buildings.**

Not surprisingly, the data in the inventory on school building condition indicates that older schools are more likely to be in poorer condition. About 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 about half of the schools in fair or worse condition today were built during that period. Only 12% of schools in use today were built before 1950, but 42% of school buildings of those rated fair or poor date back to that period. By contrast, 37% of all schools were built in 1980 or later, but only 5% of those in fair or poor condition were built since then. See figures 9 and 10.



**Estimated costs to bring all schools to good or better condition declined.**

Local officials estimate the costs to renovate or replace schools or parts of schools at \$1.6 billion. While schools that are in fair or poor condition have higher needs per school, the greater part of the costs to renovate and replace schools is for those currently in good or excellent condition. Some schools have just a few components that need improvements while the school as a whole is not in bad condition. Since the vast majority of schools are in good or better condition, these smaller costs add up to the majority of the total.

To bring the 130 schools in fair or poor condition to good or excellent condition will require an estimated \$469 million to renovate and \$93.6 million to replace (six of the schools rated in fair or poor condition are slated to be replaced). This works out to an average of \$4.3 million per school to renovate or replace those that are rated fair or poor. The comparable amounts for all schools are \$1.3 billion to renovate and \$270 million for replacements. This is an average of \$905 thousand per school.

Since the last inventory, renovation needs increased by \$149 million (12.8%) to a total of \$1.3 billion. The costs to replace schools declined by \$32 million (10.6%) to \$270 million. The difference in the number of schools that need to be replaced each year accounts for most of the changes in overall estimated costs. That number has been 18 or 19 in each of the last four years with exception of 2008 when 13 schools needed to be replaced.

Some schools that need to be replaced still have renovation needs in the meantime. School systems sometimes cannot immediately afford replacement and so continue to renovate until funds are available. 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 is scheduled to open in 2012. The old building will be renovated and used to move grades 6 through 8 out of the county's current K-8 schools.

*Larger systems have greater total renovation needs.*

School systems with more students also have more school buildings, which is the primary reason larger school systems have the greatest renovation needs. Davidson County alone accounts for almost 30% of total renovation needs with \$386 million reported. Davidson County's renovation needs are almost four times those of the system with the second-highest estimated costs, Knox County (\$97 million). Of the ten school systems reporting the highest estimated costs to renovate and replace schools, seven are large school systems. The remaining three—Bristol, Johnson City, and Coffee County—have fewer students and fewer schools but are still not among the smallest systems. See table 22.

**Table 22. Ten Systems with the Highest Renovation Needs**  
*Five-year Period July 2010 through June 2015*

<b>System</b>	<b>Total Renovation Costs</b>	<b>Percent of Total Renovation Needs</b>	<b>2010 ADMs</b>	<b>2010 ADM Rank</b>
Davidson County	\$386,010,000	29.4%	73,447	2
Knox County	96,629,051	7.4%	55,521	3
Montgomery County	71,953,000	5.5%	28,661	8
Wilson County	61,722,190	4.7%	15,057	10
Memphis	57,199,690	4.4%	105,816	1
Bristol	52,742,139	4.0%	3,853	58
Johnson City	51,338,788	3.9%	7,313	27
Coffee County	29,755,000	2.3%	4,333	51
Shelby County	29,335,500	2.2%	47,892	4
Hamilton County	28,075,500	2.1%	40,677	5
<b>Top 10 Total</b>	<b>\$864,760,858</b>	<b>66.0%</b>	<b>382,570</b>	
<b>Grand Total</b>	<b>\$1,310,850,359</b>	<b>100.0%</b>	<b>948,508</b>	

*Smaller systems can have high per-student needs.*

Sometimes smaller school systems are overlooked when considering overall costs. Compared with larger school systems, those with fewer students may have smaller total renovation needs. The two systems with the highest renovation needs per student—Bristol and Lake County—are not among the largest school systems. In fact, Lake County ranks 122<sup>nd</sup> among school systems and 93<sup>rd</sup> among counties in 2010 enrollment. Bristol ranks 58<sup>th</sup> among systems and the full Sullivan County area ranks 9<sup>th</sup> among all 95 counties. See table 23.

**Table 23. Ten Systems with the Highest Per-Student Renovation Need**  
*Five-year Period July 2010 through June 2015*

<b>System</b>	<b>Estimated Renovation Cost</b>	<b>2010 ADMs</b>	<b>2010 ADM Rank</b>	<b>Per Student Renovation Costs</b>
Bristol	\$52,742,139	3,853	58	\$13,690
Lake County	11,317,200	893	122	\$12,669
Johnson City	51,338,788	7,313	27	\$7,020
Coffee County	29,755,000	4,333	51	\$6,867
Davidson County	386,010,000	73,447	2	\$5,256
Humboldt	6,650,000	1,293	112	\$5,142
Wilson County	61,722,190	15,057	10	\$4,099
Elizabethton	8,401,416	2,137	93	\$3,931
Trenton SSD	4,850,000	1,400	108	\$3,465
Tullahoma	11,146,200	3,328	70	\$3,349
<b>Top Ten Total</b>	<b>\$623,932,933</b>	<b>113,054</b>		<b>\$5,519</b>

Both Bristol and Lake County need over \$10,000 per student to renovate their schools, a far higher amount than the rest of the systems with the highest renovation needs per student (see table 23). Renovation projects are planned for all three of Lake County’s schools. With a “fair” condition rating, Lake County High School needs renovations to all of its classrooms, the cafeteria, the library, administrative offices, and the gym. Lake County officials first noted the need to renovate most of these in 2005, but the projects remain in the conceptual phase. Lake County’s two elementary schools are both in good condition overall, but have some components that need upgrades. Local officials also first reported most of these in 2005. Other than a science classroom upgrade, which is under construction at Lara Kendall Elementary, all of these projects remain in the conceptual phase.

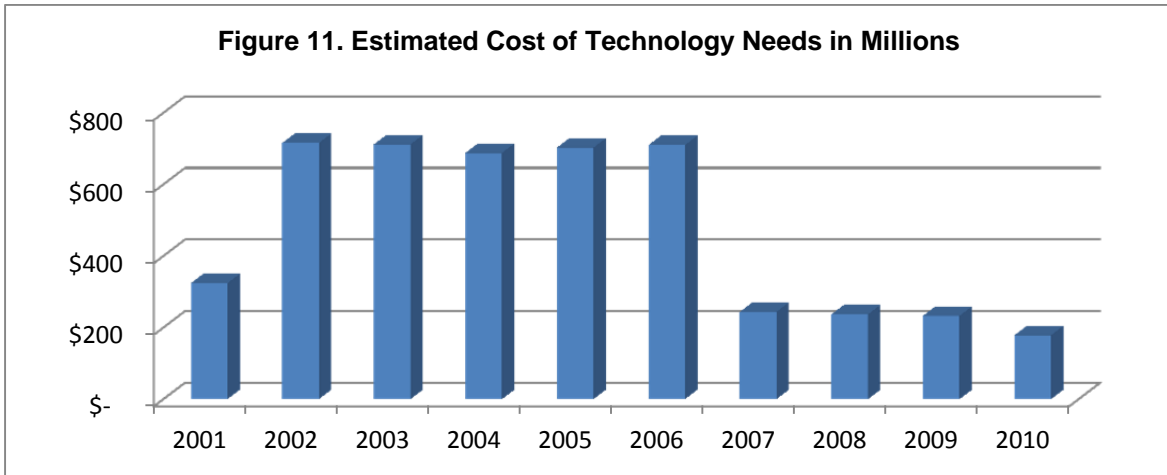
Bristol has four schools in fair condition that need expensive updates to many components, including classrooms, libraries, gyms and cafeterias. Most of these have been in the inventory for several years, but only those at Tennessee High School have advanced to the planning and design phase. Two Bristol schools are in good condition and need just a few component upgrades. The new Fairmount Elementary was finished in 2010 and has no renovation needs. All but Fairmount have projects under construction to update heating and air conditioning systems and otherwise improve energy efficiency.

***Technology needs continue to decrease.***

Technology improvement needs declined \$54 million (23.2%) in 2010 compared with 2009, after remaining steady for three years. At \$179 million, technology upgrade needs are at their lowest



level since TACIR began the infrastructure inventory and are about 25% of their high of \$716 million in 2002. New equipment is becoming less expensive every year, so schools are getting more for less when they upgrade equipment.<sup>9</sup> Changes in technology will likely bring further decreases in infrastructure needs, especially if schools begin to rely on wireless or satellite access, which requires less infrastructure spending. Also, technology infrastructure for new schools is included in the overall cost of new schools rather than in these figures. See figure 11.



<sup>9</sup> The Bureau of Economic Analysis price index for computers and peripherals stood at .62 in 2010, compared to 1.00 in the base year of 2000. See <http://www.frbsf.org/csip/data/charts/chart28.cfm>