Building Tennessee's Tomorrow:

Anticipating the State's Infrastructure Needs

July 2014 through June 2019

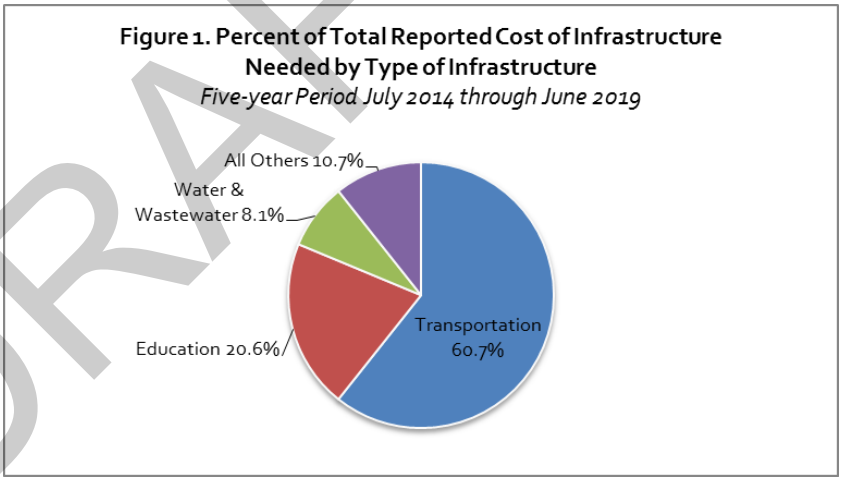
INFRASTRUCTURE NEEDS STATEWIDE

The estimated cost of public infrastructure needed statewide changed little overall.

State and local officials estimate the cost of public infrastructure improvements that need to be in some stage of development between July 1, 2014, and June 30, 2019, at $41.5 billion, a decrease of approximately $299 million (0.7%) from last year's report (see table 3).[7] This decrease, the first overall since 2009, is largely the result of a $611 million decrease in the Transportation and Utilities category driven by more than $1 billion in decreased costs for road projects already in the inventory—the first year-to-year decrease for this type of infrastructure. Despite this decrease, transportation infrastructure improvements account for about the same percentage of the total inventory this year (60.7%) as last (61.7%) and remain higher than in the 2011 and 2012 inventories (56.7% and 56.8%). Education infrastructure has been about the same percentage of total needs since 2007 and now stands at 20.6%; water and wastewater follows at 8.1% of the total. All other types of infrastructure projects combined make up 10.7%, similar to last year. See figure 1.

Figure 1. Percent of Total Reported Cost of Infrastructure Needed by Type of Infrastructure

Five-year Period July 2014 through June 2019



[7] For complete listings of all needs reported in the July 2014 inventory by county and by public school system, see appendixes D and F.

Table 3. Comparison of Estimated Cost of Needed Infrastructure Improvements
July 2013 Inventory vs. July 2014 Inventory

Category and Type of Infrastructure	July 2013 Inventory	July 2014 Inventory	Difference	Percent Change
Transportation and Utilities	**$25,997,869,316**	**$25,386,780,890**	**$(611,088,426)**	**-2.4%**
Transportation	25,782,040,358	25,171,624,684	(610,415,674)	-2.4%
Other Utilities	215,828,958	215,156,206	(672,752)	-0.3%
Education	**$8,325,726,373**	**$8,529,590,647**	**$203,864,274**	**2.4%**
Post-secondary Education	4,577,656,766	4,638,558,536	60,901,770	1.3%
School Renovations & Replacements	2,160,707,154	2,383,180,734	222,473,580	10.3%
New Public Schools & Additions	1,571,806,453	1,492,144,377	(79,662,076)	-5.1%
School-System-wide	15,556,000	15,707,000	151,000	1.0%
Health, Safety and Welfare	**$4,720,186,737**	**$4,985,318,863**	**$265,132,126**	**5.6%**
Water and Wastewater	3,136,007,005	3,338,497,987	202,490,982	6.5%
Law Enforcement	929,402,199	812,256,199	(117,146,000)	-12.6%
Public Health Facilities	353,529,500	440,857,700	87,328,200	24.7%
Storm Water	103,141,357	197,945,642	94,804,285	91.9%
Fire Protection	166,246,676	168,001,335	1,754,659	1.1%
Solid Waste	30,802,000	25,902,000	(4,900,000)	-15.9%
Housing	1,058,000	1,858,000	800,000	75.6%
Recreation and Culture	**$1,696,891,580**	**$1,577,570,362**	**$(119,321,218)**	**-7.0%**
Recreation	1,058,970,329	1,044,472,729	(14,497,600)	-1.4%
Libraries, Museums, and Historic Sites	368,728,259	343,240,201	(25,488,058)	-6.9%
Community Development	269,192,992	189,857,432	(79,335,560)	-29.5%
General Government	**$670,027,009**	**$613,802,595**	**$(56,224,414)**	**-8.4%**
Public Buildings	532,227,209	524,834,478	(7,392,731)	-1.4%
Other Facilities	137,799,800	88,968,117	(48,831,683)	-35.4%
Economic Development	**$359,794,728**	**$378,847,249**	**$19,052,521**	**5.3%**
Industrial Sites and Parks	233,412,814	261,036,115	27,623,301	11.8%
Business District Development	126,381,914	117,811,134	(8,570,780)	-6.8%
Grand Total	**$41,770,495,743**	**$41,471,910,606**	**$(298,585,137)**	**-0.7%**

*School Renovations and Replacements include school technology projects with estimated costs below the $50,000 threshold used for other types of infrastructure included in the inventory. Individual technology projects under the threshold totaled $3,541,536 in 2014 and $4,527,243 in 2013.

Improvements that support other public infrastructure total more than $548 million.

Some public infrastructure improvements are needed to support others rather than to directly support the private sector (homes, businesses, etc.). When that's the case, those costs are included with the infrastructure they support to show the full cost of that improvement. This is true for all property acquisition and some transportation, storm water, telecommunications, and

other utilities improvements. For example, if a rail spur is needed to create a new industrial site, then the rail spur is recorded in the inventory as an industrial site project with transportation as its secondary project type. Similarly, if a sewer line or storm-water drain is needed for a new school, then the project is recorded as new school construction with water and wastewater or storm water as its secondary type. This dual classification allows more flexibility in analyzing the costs of different types of infrastructure improvements. Those costs are included with the infrastructure they support in table 3 and throughout this report except where they are broken out in table 4 below.

Table 4. Comparison of Infrastructure that Provides Direct Service to Private Sector and Infrastructure that Supports Other Public Infrastructure
Five-year Period July 2014 through June 2019

	Provides Direct Service to Private Sector		Supports Other Public Infrastructure		
Type of Infrastructure	**Est. Cost** [in millions]	**Percent of Total**	**Est. Cost** [in millions]	**Percent of Total**	**Total Est. Cost** [in millions]
Transportation	$ 25,171.6	99.5%	$ 120.9	0.5%	$ 25,292.5
Water and Wastewater	3,338.5	98.5%	51.2	1.5%	3,389.7
Other Utilities	215.2	99.2%	1.8	0.8%	217.0
Storm Water	197.9	90.8%	20.1	9.2%	218.0
Property Acquisition	0.0	0.0%	353.7	100.0%	353.7
Grand Total	**$ 28,923.2**	**98.14%**	**$ 547.6**	**1.86%**	**$ 29,470.8**

Transportation infrastructure continues to dominate the inventory.

Transportation and Utilities is and always has been the largest category of infrastructure in the inventory and totals $25.4 billion this year, an overall decrease of $611 million since the last inventory. Transportation alone, at $25.2 billion, accounts for nearly all this category as well as all but a few hundred thousand dollars of the decrease. See table 3. The net $610 million decrease in the estimated cost of transportation projects includes $1.3 billion in reduced costs for projects already in the inventory, $440 million worth of canceled projects, $335 million for projects now considered not needed within this report's five-year window, and $303 million for projects that were completed. Projects totaling $235 million were removed from the inventory because improved methods of project tracking and quality control identified duplicates and invalid information. The decreased costs are only partially offset by $1.4 billion in new projects and $622 million in project cost increases.

At $14.2 billion, road projects make up the majority (56.5%) of transportation infrastructure costs reported in the inventory, and these costs decreased by nearly $1.1 billion—the biggest change

for any single type of infrastructure in the inventory. This reduction resulted from a combination of decreased costs for existing road projects and projects that were completed, canceled, or postponed partially offset by increases in the cost of other projects as well as new ones. The estimated costs of projects are often revised from one inventory to the next because the size or scope changes or more precise information becomes available as projects progress from the conceptual stage through planning and design to construction. For example, since last year, the combined estimated cost of 116 road projects already captured by the inventory decreased more than $1 billion while the estimated cost of 212 other projects increased by more than $500 million.

Nearly $200 million, or roughly one-fifth, of the decrease in road costs is reductions produced by the Tennessee Department of Transportation's (TDOT) Expedited Project Delivery program, a structured process for identifying more cost-effective ways to meet transportation infrastructure objectives.[8] TDOT modified eight existing projects included in this inventory on state routes in Campbell, Claiborne, DeKalb, Hardeman, Loudon, Monroe, Scott, and Warren counties, reducing their combined estimated cost from $276 million to $80 million. Instead of building new roads or widening existing ones, TDOT will add guardrails, pavement markings, and signage and improve intersections, lanes, shoulders, curves, and bridges.

The estimated cost of improvements for the other type of infrastructure in the Transportation and Utilities category—other utilities, which includes electricity, gas, and telecommunications—decreased 0.3% to $215 million. Electric substation projects were completed in Alcoa ($7.3 million) and Morristown ($3 million), as was a $2.5 million gas main extension for Springfield in Robertson County. The estimated cost of two electrical system projects needed in Newport (Cocke County) decreased by $3.8 million—from $5 million to $1.2 million—because of a decrease in the area each project will cover. Four new projects that add $14.1 million to the inventory, including a $6 million electric substation in Greeneville, partially offset these decreases.

School renovations and replacements drive increased Education infrastructure needs.

Education, which includes post-secondary and public school facilities, is the second largest category ($8.5 billion) and increased $204 million (2.4%). The cost of improving public school buildings, including both new space and improvements in existing school facilities, has been relatively flat overall since 2007 but increased 3.8% this year to $3.8 billion, mainly for school renovations and additions to existing schools. The estimated cost of improving existing school buildings, including renovations ($1.8 billion), whole-building replacements ($320 million), technology infrastructure ($113 million), and mandated facility upgrades ($113 million), increased by $218 million (10.5%) to a total of $2.3 billion—the sixth increase in the estimated cost for

[8] See http://tn.gov/tdot/section/strategic-transportation-investments and http://www.greenevillesun.com/news/tdot-commissioner-says-dept-taking-closer-look-at-road-project/article_01b50924-b10b-565d-becf-ce4052b857f9.html.

improving existing schools in the past seven inventories. The $1.8 billion in renovations includes $85 million in improvements needed by the state-owned Alvin C. York Agricultural Institute in Fentress County and the schools for the blind and the deaf. Improvements at these schools increased by a net $4 million—two new renovation projects at the Tennessee School for the Blind totaling $5.8 million were added, but this increase was partially offset by a $1.3 million decrease in the estimated cost of a project to replace air conditioning systems as well as the completion of a $470,000 parking lot. School system-wide needs for projects like bus garages and central office buildings, which serve entire school systems, increased slightly by $151,000 (1.0%). Projects under construction include security systems and phone system upgrades. The public schools chapter, presented later in this report, provides more information about infrastructure needs for the state's local school systems.

The need for additions to existing schools increased for the third year in a row with a $38 million (11.0%) increase, while the need for new schools decreased $117 million (9.6%) as some local governments refined their plans in response to changing enrollment and other factors. For example, Shelby County reported needing a $57 million high school in their unincorporated area until a system consolidation and subsequent restructuring shifted the school district boundaries. Washington County recently decided that it made more sense to rehab their schools instead of spending $65 million on two K-8 schools. And Tipton County, which for the past eight inventories had reported that they needed $56 million to build three new schools to meet growing student enrollment, decided to renovate their existing buildings instead because enrollment peaked in 2009 at 11,781 and has since declined to 11,215 (4.8%).

After an increase of more than $600 million in 2013, the estimated cost of improvements needed at the state's post-secondary education campuses increased by just $61 million (1.3%) in 2014 and now totals just over $4.6 billion. More than 200 new projects totaling $1.4 billion were added to the inventory, including a $103 million College of Engineering facility and two large projects to replace and add new residence halls at the University of Tennessee in Knoxville ($234 million and $99 million each). New projects alone and increases totaling $204 million in the cost of projects already in the inventory outweigh the $980 million worth of projects completed in 2014, the $285 million canceled, and the $67 million of infrastructure needs that were postponed.

Health, Safety, and Welfare needs increased, mostly because of increased costs for water, wastewater, and storm water infrastructure.

Health, Safety, and Welfare, the third largest category in the inventory, increased $265 million (5.6%) to nearly $5.0 billion, mainly because of growing needs for improved water, wastewater, and storm water infrastructure. Water and wastewater accounts for the largest portion of the Health, Safety, and Welfare category at more than $3.3 billion. The amount needed for this type of infrastructure increased $202.5 million (6.5%) from last year, mainly because the estimated cost of two sewer-system improvements in Davidson County increased $296 million to a total of $736 million because of delays and changes in scope. These projects are needed to reduce combined storm water and sewer flows into the Cumberland River in Davidson County as required by the US Environmental Protection Agency in order to comply with the Clean Water Act. A

$94.8 million increase in storm water needs, a 91.9% increase over last year, came mostly from the addition of $100 million for a floodwall and pump station along the Cumberland River in Nashville, a project recommended by Nashville's Metro Water Services after the devastating 2010 flood.

Public health facilities contribute $87.3 million to the increase in Health, Safety, and Welfare costs. New improvement needs added $93 million to this inventory, including $55 million for a Tri-Cities Veterans' Home in Sullivan County and $11.6 million for a new client resource center in Davidson County for the Tennessee Department of Intellectual and Developmental Disabilities. Cost increases for projects already in the inventory added another $27.6 million. Few projects were completed, the largest being Houston County's $7.5 million purchase of the Patients Choice Medical Center in Erin. The cancelation of two projects reduced the amount needed by $20 million. Also in this category, new fire protection projects as well as cost increases led to an overall $1.8 million increase despite $11.6 million in canceled projects and $10.6 million in postponed improvements. And a new seven-unit public housing project in Johnson City added $800,000 to this category.

Overall increases in water and wastewater, storm water, public health facilities, fire protection, and housing were offset somewhat by overall decreases in law enforcement and solid waste infrastructure. The estimated cost for law enforcement infrastructure improvements decreased $117 million (12.6%) to $812 million (following a $365 million decrease from 2012-13) mainly because projects costing $95.6 million were completed, including a $40 million police precinct and forensic laboratory in Nashville. And the proposed $40 million Greene County Justice Center was canceled. The fifteen projects added to this year's inventory cost just $33 million. The $4.9 million decrease in solid waste needs was the result of completion of projects costing $4.3 million and the addition of only one new, $350,000 project—a transfer station in Henry County—to this year's inventory.

Completed community development projects drove a decrease in Recreation and Culture costs.

The Recreation and Culture category decreased $119 million (7.0%) to $1.6 billion, with decreased costs for all three types of infrastructure in the category: community development; libraries, museums, and historic sites; and recreation. Two large community development projects, one in Sevier County and the other in Memphis, were completed, contributing to an overall decrease of $79.3 million. Sevier County completed the $44.5 million LeConte Pigeon Forge Civic Center, and Memphis completed the $43.6 million Beale Street landing and riverfront improvement project.

Costs for libraries, museums, and historic sites declined by $25.5 million, in large part because of decreased costs for projects already in the inventory. The most notable reduction results from a decision to renovate a donated building for the Coopertown Library and Historical Museum at a cost of $200,000 instead of building a new library and museum for $15 million. Projects completed, including a $4.3 million library expansion in Springfield and $4.2 million for two library

expansions in Nashville, outweighed the cost of three new projects, the largest a $5 million library in Greene County.

The amount needed for recreation projects decreased by $14.5 million. Although 69 new projects added $91 million to this year's inventory, more than $77 million in projects were completed and another $47 million were canceled. Most notably, the $22 million Rocky Top Sports Arena in Gatlinburg was completed and opened in June 2014. Significant projects canceled include $19 million for a multipurpose recreation facility in Giles County, which will pursue a smaller indoor recreation facility elsewhere instead, and $7.5 million for an arena in Dyersburg, which has decided to expand existing buildings to meet its needs at a lower cost.

Completion of several projects and a change in scope reduced the amount needed for General Government buildings and facilities.

The estimated cost of infrastructure improvements in the General Government category, which includes other facilities and public buildings, decreased $56.2 million (8.4%) to $613.8 million since last year's inventory. The biggest portion of the $48.8 million decrease in other facilities comes from Memphis, where a $46.2 million project to relocate a vehicle-maintenance shop near St. Jude Hospital was replaced with two less costly projects.

Completions and cancelations are responsible for a $7.4 million decrease in infrastructure needs for public buildings. Completed projects total more than $70 million, including nine state-owned projects totaling $53.8 million that include HVAC and mechanical system upgrades at the Andrew Jackson Building ($22 million) and Tennessee Tower ($20 million) in Nashville. Canceled projects total $31 million, including a $9 million project to turn the Old School Country Store in Surgoinsville (Hawkins County) into a town hall. Sixteen projects owned by the state totaling $20.1 million were also canceled, including $6.5 million in planned renovations at the Donnelley J. Hill State Office Building in Shelby County that has been closed instead. Offsetting these completions and cancelations were more than $52 million in new projects, most notably $23 million for a new state crime lab in Jackson, and cost increases for projects already in the inventory, including a $38 million increase for mechanical and electrical upgrades at Legislative Plaza and the War Memorial office building.

The cost of a single industrial park road project more than offset reductions resulting from Economic Development projects completed.

The Economic Development category increased $19.1 million (5.3%) overall to $378.8 million. The cost of industrial sites and parks increased $27.6 million (11.8%) largely because a new $40 million road project to open up land for development and create better access to the Airport Industrial Park in White County overshadowed the completion of ten other projects totaling $9.6 million and decreases of $9.3 million for projects remaining in the inventory. Increased costs reported for other projects already in the inventory total $13.6 million.

Business district development needs decreased $8.6 million (6.8%), mainly because $8.1 million in streetscape improvements along Dickerson Road in Nashville were completed. Cost decreases outweighed increases for most of the business-district-development projects remaining in the inventory, and four new projects added only $2.3 million to the category.

State infrastructure improvements continue to dominate overall, and county improvements continue to exceed those of cities.

The differing functions of the state and its cities and counties are illustrated by how the cost of each type of infrastructure is distributed among them. Based on cost, the majority of all public infrastructure needs in the inventory (62.3%) belong to state agencies (see figure 2), but just two types account for $24.1 billion of the $25.8 billion total reported for state government: transportation and post-secondary education. Nearly all improvements in post-secondary education infrastructure (99.9%) are needed by the state's public colleges and universities, and more than three-fourths (77.1%) of transportation improvements are the responsibility of the state. The largest portion of four other infrastructure types are also the responsibility of the state. The largest of these four are law enforcement ($477 million) and public health facilities ($428 million). The amounts needed by the state for these two types of infrastructure exceed half of the totals for both (58.8% and 97.1%). The state is also responsible for 70.3% of the cost of libraries, museums, and historic sites ($241 million) and 55.7% of the cost of public buildings ($293 million). See table 5.

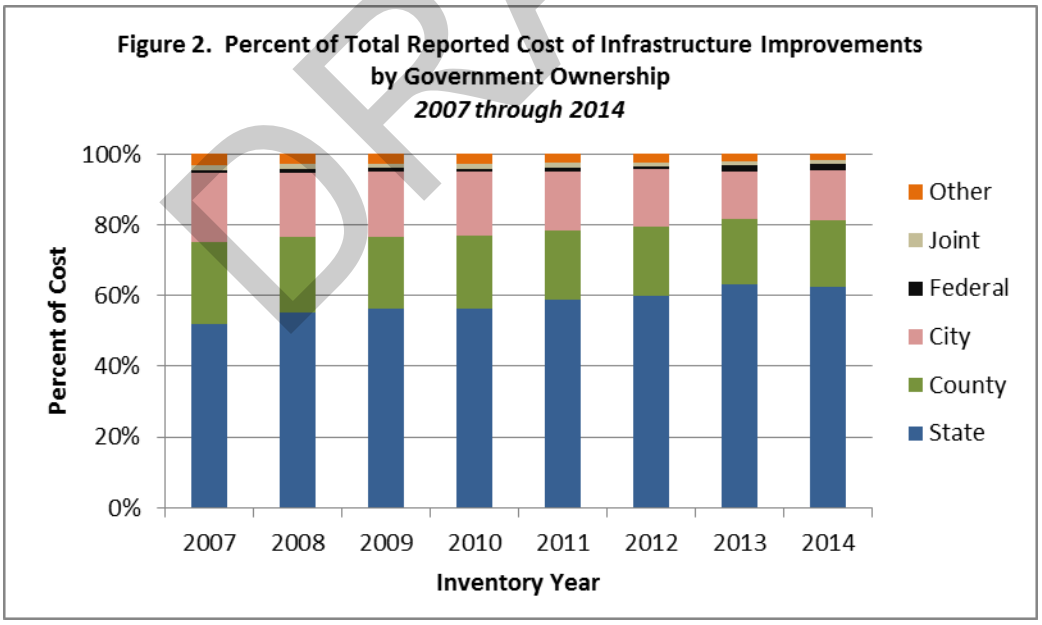


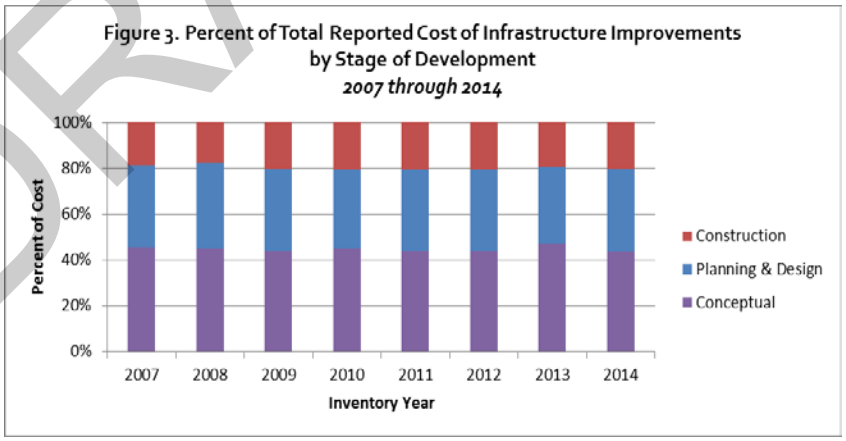
Table 5. Total Estimated Cost in Millions and Percent of Total of Needed Infrastructure Improvements by Project Type and Level of Government

Five-year Period July 2014 through June 2019

Category and Type of Infrastructure	City		County		State		Federal		Joint		Other		Total	
	Estimated Cost [in millions]	Percent of Total	Estimated Cost [in millions]	Percent of Total	Estimated Cost [in millions]	Percent of Total	Estimated Cost [in millions]	Percent of Total	Estimated Cost [in millions]	Percent of Total	Estimated Cost [in millions]	Percent of Total	Estimated Cost [in millions]	Percent of Total
Transportation and Utilities	**$ 2,662.6**	**10.5%**	**$ 2,356.1**	**9.3%**	**$ 19,419.2**	**76.5%**	**$ 698.0**	**2.7%**	**$ 234.0**	**0.9%**	**$ 16.9**	**0.1%**	**$ 25,386.8**	**100.0%**
Transportation	2,510.0	10.0%	2,316.2	9.2%	19,419.2	77.1%	698.0	2.8%	228.0	0.9%	0.3	0.0%	25,171.6	100.0%
Other Utilities	152.6	70.9%	39.9	18.5%	0.0	0.0%	0.0	0.0%	6.0	2.8%	16.6	7.7%	215.2	100.0%
Education	**$ 377.2**	**4.4%**	**$ 3,408.7**	**40.0%**	**$ 4,718.4**	**55.3%**	**$ 0.0**	**0.0%**	**$ 0.0**	**0.0%**	**$ 25.2**	**0.3%**	**$ 8,529.6**	**100.0%**
Post-secondary Education	0.4	0.0%	3.1	0.1%	4,635.1	99.9%	0.0	0.0%	0.0	0.0%	0.0	0.0%	4,638.6	100.0%
School Renovations & Replacements	241.8	10.1%	2,042.9	85.7%	83.3	3.5%	0.0	0.0%	0.0	0.0%	15.1	0.6%	2,383.2	100.0%
New Public Schools & Additions	134.9	9.0%	1,348.7	90.4%	0.0	0.0%	0.0	0.0%	0.0	0.0%	8.6	0.6%	1,492.1	100.0%
School System-wide	0.2	1.2%	14.0	89.2%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.5	9.5%	15.7	100.0%
Health, Safety and Welfare	**$ 1,772.6**	**35.6%**	**$ 1,480.1**	**29.7%**	**$ 907.0**	**27.2%**	**$ 0.5**	**0.0%**	**$ 151.1**	**4.5%**	**$ 674.0**	**20.2%**	**$ 4,985.3**	**117.1%**
Water and Wastewater	1,487.2	44.5%	1,027.8	30.8%	0.0	0.0%	0.0	0.0%	149.8	4.5%	673.6	20.2%	3,338.5	100.0%
Law Enforcement	74.6	9.2%	260.3	32.0%	477.4	58.8%	0.0	0.0%	0.0	0.0%	0.0	0.0%	812.3	100.0%
Public Health Facilities	1.0	0.2%	11.4	2.6%	428.0	97.1%	0.5	0.1%	0.0	0.0%	0.0	0.0%	440.9	100.0%
Fire Protection	105.6	62.9%	60.4	36.0%	1.7	1.0%	0.0	0.0%	0.3	0.2%	0.0	0.0%	168.0	100.0%
Storm Water	95.8	48.4%	101.0	51.0%	0.0	0.0%	0.0	0.0%	0.8	0.4%	0.3	0.2%	197.9	100.0%
Solid Waste	6.6	25.3%	19.1	73.9%	0.0	0.0%	0.0	0.0%	0.2	0.8%	0.0	0.0%	25.9	100.0%
Housing	1.9	100.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.9	100.0%
Recreation and Culture	**$ 694.7**	**44.0%**	**$ 385.8**	**24.5%**	**$ 473.3**	**30.0%**	**$ 0.2**	**0.0%**	**$ 23.1**	**1.5%**	**$ 0.5**	**0.0%**	**$ 1,577.6**	**100.0%**
Recreation	515.3	49.3%	319.0	30.5%	205.4	19.7%	0.2	0.0%	4.6	0.4%	0.0	0.0%	1,044.5	100.0%
Community Development	117.2	61.7%	33.3	17.5%	26.5	14.0%	0.0	0.0%	12.3	6.5%	0.5	0.3%	189.9	100.0%
Libraries, Museums, and Historic Sites	62.2	18.1%	33.6	9.8%	241.4	70.3%	0.0	0.0%	6.1	1.8%	0.0	0.0%	343.2	100.0%
Economic Development	**$ 129.5**	**34.2%**	**$ 199.6**	**52.7%**	**$ 1.3**	**0.3%**	**$ 0.0**	**0.0%**	**$ 40.5**	**10.7%**	**$ 7.9**	**2.1%**	**$ 378.8**	**100.0%**
Business District Development	81.0	68.7%	14.6	12.4%	0.0	0.0%	0.0	0.0%	19.4	16.5%	2.9	2.5%	117.8	100.0%
Industrial Sites and Parks	48.6	18.6%	185.1	70.9%	1.3	0.5%	0.0	0.0%	21.1	8.1%	5.0	1.9%	261.0	100.0%
General Government	**$ 163.2**	**26.6%**	**$ 119.4**	**19.5%**	**$ 310.4**	**50.6%**	**$ 20.0**	**3.3%**	**$ 0.0**	**0.0%**	**$ 0.8**	**0.1%**	**$ 613.8**	**100.0%**
Public Buildings	111.0	21.1%	100.6	19.2%	292.6	55.7%	20.0	3.8%	0.0	0.0%	0.7	0.1%	524.8	100.0%
Other Facilities	52.2	58.7%	18.8	21.1%	17.9	20.1%	0.0	0.0%	0.0	0.0%	0.1	0.1%	89.0	100.0%
Grand Total	**$ 5,799.9**	**14.0%**	**$ 7,949.8**	**19.2%**	**$ 25,829.7**	**62.3%**	**$ 718.7**	**1.7%**	**$ 448.6**	**1.1%**	**$ 725.2**	**1.7%**	**$ 41,471.9**	**100.0%**

The cost of infrastructure needed by counties ($7.9 billion) greatly exceeds the amount needed by cities ($5.8 billion). County needs exceed half the cost of six of the 20 types of infrastructure in the inventory, while city needs dominate eight of them. Counties are responsible for most of new school and addition construction (90.4%), school system-wide infrastructure (89.2%), renovation and replacement of existing schools (85.7%), solid waste infrastructure (73.9%), industrial sites and parks (70.9%), and storm water infrastructure (51.0%). On the other hand, almost half the cost of water and wastewater (44.5%) and recreation (49.3%) infrastructure needs in the inventory belongs to cities, as does all of public housing (100%) and most of other utilities (70.9%), business district development (68.7%), fire protection (62.9%), other facilities (58.7%), and community development (61.7%) infrastructure. If transportation projects are excluded from total costs, ownership in terms of estimated costs is more evenly distributed between the state (39.3%) and its counties (34.6%) with the remainder divided among cities (20.2%), other types of governmental entities such as utility districts and special school districts (4.4%), joint ownership (1.4%), and only a tiny fraction (0.1%) in federal ownership. These percentages are nearly identical to those for projects from five years ago that have since been completed—37.5% state, 34.2% counties, 22.6% cities, 4.4% special districts, and 1.3% jointly owned—even those figures exclude improvements in existing school buildings and facilities belonging to state agencies.

The estimated cost of infrastructure improvements in all three stages of development continues to trend upward.



The estimated cost of each infrastructure need in the inventory is reported as being in one of three stages—conceptual, planning and design, or construction. The distribution of costs by stage has remained relatively consistent over the past seven years (see figure 3), especially for those in the construction phase, as the estimated cost of infrastructure improvements in all three phases increased. Projects in the conceptual stage make up nearly half (43.8%), $18.2 billion, of the amount reported in the current inventory. Improvements in the planning and design stage total $14.9 billion (35.9%) and improvements under construction total $8.4 billion (20.3%). See figure 4 and table 6.

Table 6. Needed Infrastructure Improvements in Millions and Percent of Total by Category, Project Type, and Stage of Development

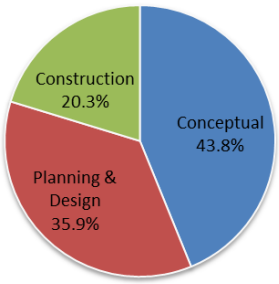
Five-year Period July 2014 through June 2019

	Conceptual				Planning & Design				Construction			
Category and Type of Infrastructure	Number		Cost		Number		Cost		Number		Cost	
Transportation and Utilities	**7,259**	**81.3%**	**$ 10,367.3**	**40.8%**	**1,097**	**12.3%**	**$ 10,562.8**	**41.6%**	**574**	**6.4%**	**$ 4,456.7**	**17.6%**
Transportation	7,227	81.6%	10,240.6	40.7%	1,076	12.1%	10,504.2	41.7%	559	6.3%	4,426.9	17.6%
Other Utilities	32	47.1%	126.7	58.9%	21	30.9%	58.6	27.2%	15	22.1%	29.8	13.9%
Education	**2,615**	**63.3%**	**$ 4,673.7**	**54.8%**	**815**	**19.7%**	**$ 2,118.8**	**24.8%**	**700**	**16.9%**	**$ 1,737.1**	**20.4%**
Post-secondary Education	239	48.7%	2,078.9	44.8%	132	26.9%	1,357.6	29.3%	120	24.4%	1,202.0	25.9%
School Renovations & Replacements	2,128	65.0%	1,593.1	66.8%	603	18.4%	446.6	18.7%	545	16.6%	343.5	14.4%
New Public Schools & Additions	238	68.0%	992.0	66.5%	79	22.6%	311.4	20.9%	33	9.4%	188.8	12.7%
School System-wide	10	76.9%	9.7	62.0%	1	7.7%	3.2	20.4%	2	15.4%	2.8	17.6%
Health, Safety and Welfare	**799**	**56.0%**	**$ 1,928.9**	**38.7%**	**398**	**27.9%**	**$ 1,537.7**	**30.8%**	**231**	**16.2%**	**$ 1,518.7**	**30.5%**
Water and Wastewater	557	54.0%	1,097.1	32.9%	302	29.3%	1,058.7	31.7%	173	16.8%	1,182.7	35.4%
Law Enforcement	85	53.8%	365.8	45.0%	47	29.7%	263.1	32.4%	26	16.5%	183.4	22.6%
Public Health Facilities	37	74.0%	331.2	75.1%	6	12.0%	46.8	10.6%	7	14.0%	62.8	14.3%
Fire Protection	76	71.7%	67.2	40.0%	17	16.0%	44.1	26.3%	13	12.3%	56.7	33.8%
Storm Water	31	55.4%	53.5	27.0%	19	33.9%	116.8	59.0%	6	10.7%	27.6	13.9%
Solid Waste	13	56.5%	14.2	54.9%	7	30.4%	8.2	31.5%	3	13.0%	3.5	13.6%
Housing	0	0.0%	0.0	0.0%	0	0.0%	0.0	0.0%	3	100.0%	1.9	100.0%
Recreation and Culture	**372**	**52.4%**	**$ 619.6**	**39.3%**	**217**	**30.6%**	**$ 487.0**	**30.9%**	**121**	**17.0%**	**$ 471.0**	**29.9%**
Recreation	298	53.3%	339.5	32.5%	170	30.4%	319.7	30.6%	91	16.3%	385.3	36.9%
Libraries, Museums, and Historic Sites	35	46.1%	178.9	52.1%	25	32.9%	128.5	37.4%	16	21.1%	35.8	10.4%
Community Development	39	52.0%	101.1	53.3%	22	29.3%	38.8	20.5%	14	18.7%	49.9	26.3%
General Government	**114**	**57.0%**	**$ 384.5**	**62.6%**	**64**	**32.0%**	**$ 130.9**	**21.3%**	**22**	**11.0%**	**$ 98.4**	**16.0%**
Public Buildings	86	56.2%	343.7	65.5%	51	33.3%	108.7	20.7%	16	10.5%	72.4	13.8%
Other Facilities	28	59.6%	40.7	45.8%	13	27.7%	22.2	25.0%	6	12.8%	26.0	29.2%
Economic Development	**67**	**55.8%**	**$ 202.8**	**53.5%**	**26**	**21.7%**	**$ 43.2**	**11.4%**	**27**	**22.5%**	**$ 132.8**	**35.1%**
Business District Development	10	29.4%	18.8	15.9%	10	29.4%	12.3	10.4%	14	41.2%	86.8	73.6%
Industrial Sites and Parks	57	66.3%	184.1	70.5%	16	18.6%	30.9	11.8%	13	15.1%	46.1	17.7%
Grand Total	**11,226**	**72.3%**	**$ 18,176.8**	**43.8%**	**2,617**	**16.9%**	**$ 14,880.4**	**35.9%**	**1,675**	**10.8%**	**$ 8,414.7**	**20.3%**

Note: The project count includes all projects at a school. A school can have more than one project and those projects can be in different stages. For complete listings of costs by project type, stage of development, and county, see appendix D.

Over the last four inventories, the share of project costs in the Recreation and Culture and in the Health, Safety, and Welfare categories in the construction stage increased as the share of project costs in the conceptual stage decreased. Projects in these categories seem to be progressing from the conceptual stage to planning and from planning to construction. However, fluctuations for types within the categories can be obscured by trends at the category level. For example, although the overall percentage of Recreation and Culture costs in the construction stage rose each of the last two years, the percentage for the community development projects in that category fell.

Figure 4. Percent of Total Reported Cost of Infrastructure Improvements by Stage of Development
Five-year Period July 2014 through June 2019



State and federal mandates affect 3.0% of all projects.

Commission staff do not ask local or state officials to identify costs related to state and federal mandates, except for improvements at existing schools and new schools, because officials reporting their needs often do not have the detailed information necessary to separate that out of total project costs (e.g., the cost of access ramps and lowered water fountains required by the Americans with Disabilities Act [ADA]). They are asked, however, to indicate whether the cost of any projects are affected by mandates. While it is impossible to determine how much state and federal facilities mandates cost, it is possible to determine the overall number of projects affected by mandates—466 projects in this inventory; the number has been fewer than 500 in each inventory since 2007. The inclusion of bridges rated insufficient by a state inspector with an identified remedy and associated cost estimate in last year's report increased the total project count for transportation but not the number of projects affected by mandates and brought last year's percentage down from around 4.4% the previous year to 3.2%. See figure 5. The number decreased slightly, to 3.1% this year, as the total number of all projects in this year's inventory increased over last year.

Figure 5. Percent of Projects Affected by Mandates
2007 through 2014

Approximately 14.0% (7) of all needed improvements at public health facilities are affected by mandates (see table 7). Those mandates include ADA compliance, asbestos remediation, fire safety, and lead paint remediation. Local officials also reported that 8.5% (280) of school renovations and replacements are needed because of mandates, including the state's 1992 Education Improvement Act (EIA), which limits class size to 25 to 35 students depending on the grade level. Although the EIA tends to require new classrooms as student enrollments grow, of all the school systems with growing enrollment, only Rutherford County reported needing to build a new school because of it.

Outside of these top two, mandates affect just 1.5% of all infrastructure projects, as has been the case for many years. Transportation has the second largest number of projects affected by mandates, though those 57 projects are less than 1.0% of the total of 8,862 transportation projects.

Table 7. Percent of Projects Affected by Mandates
Five-year Period July 2014 through June 2019

Type of Infrastructure	Number of Projects or Schools Reported	Projects or Schools Affected by Mandates	
		Number	Percent
Public Health Facilities	50	7	14.0%
School Renovations & Replacements	3,276	280	8.5%
Post-secondary Education	491	41	8.4%
Law Enforcement	158	9	5.7%
Recreation	559	30	5.4%
Community Development	75	4	5.3%
Libraries, Museums, and Historic Sites	76	4	5.3%
Public Buildings	153	6	3.9%
Business District Development	34	1	2.9%
Water and Wastewater	1,032	24	2.3%
Storm Water	56	1	1.8%
Fire Protection	106	1	0.9%
Transportation	8,862	57	0.6%
New Public Schools and Additions	350	1	0.3%
Industrial Sites and Parks	86	0	0.0%
Other Utilities	68	0	0.0%
Other Facilities	47	0	0.0%
Solid Waste	23	0	0.0%
School System-wide	13	0	0.0%
Housing	3	0	0.0%
Grand Total	**15,518**	**466**	**3.0%**

Note: The project count includes all projects at a school and a school can have more than one project.