

# spotlight

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## THE FORSYTH FORMULA

*Other School Districts Should Learn These Construction Principles*

**S U M M A R Y :** Since 2001, Winston-Salem/Forsyth Schools has been building and renovating schools for much less money than other school districts in North Carolina. Their secret? Core principles emphasizing building smaller and more efficient schools, resisting pressure to add or change building features, and holding down costs without compromising quality. Other school districts should adopt these principles, combined with alternative approaches to financing and building schools, to minimize their dependence on large bond issues, maximize state and local revenue, and keep taxes low.

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**I**t seems likely that 2006 will be known as the Year of the School Construction Bond. In 2006, school districts from across the state will ask voters to pass bond referendums for school construction likely totaling more than \$1.5 billion. Enrollment growth is driving the need for additional funds to build and renovate schools, and school districts are asking the taxpayers to pay the bill. In the face of rising construction costs, school districts must be committed to reducing the burden on the taxpayer by looking for ways to build and renovate schools for less money.

Winston-Salem/Forsyth Schools have been doing just that: building and renovating schools for less money than other school districts in North Carolina. The key to their success has been a number of core principles that emphasize building smaller and more efficient schools, resisting pressure to add or change building features, and holding down costs without compromising quality.

### Background

Between 1997 and 2001, North Carolina experienced a surge in student enrollment, adding over 78,000 additional students. During the same period, voters statewide approved 29 bond issues totaling over \$2.6 billion. Winston-Salem/Forsyth school district was no exception. The school district added nearly 2,500 students during this four-year period. In November 2001, voters in Forsyth County approved a \$150 million school construction and renovation bond to accommodate the district's additional students.<sup>1</sup>

The school district budgeted approximately 80 percent of the bond funds for adding seats or renovating schools and 20 percent for building new schools.

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The school district plan included the construction of three new elementary schools, one new middle school, and two new high schools. The plan called for classroom renovations and/or additions at 11 schools, improved computer and communications systems at all schools, and land purchases for proposed schools sites. The plan also called for various life cycle replacements, including upgraded classroom ventilation systems, new classroom lighting, and window repair and replacement. As of the 2005-2006 school year, the school district completed 40 percent of all renovations and classroom additions. Twenty-nine percent of the renovations are in progress or are in the design stage. The school district completed all six of the new school construction projects planned under the 2001 bond.<sup>2</sup>

### Core Principles of Cost-Effective Construction

The School Planning Division of the Department of Public Instruction offers school districts little guidance about how to build cost-effective schools. Furthermore, there are no state requirements that school districts implement standards for efficient school construction and renovation. Thus, school districts are solely responsible for implementing a cost-effective school construction and renovation program, and efforts to reduce costs vary widely.

One journalist correctly observed that the county's hold-the-line philosophy has made Winston-Salem/Forsyth County Schools "a model for using school bonds efficiently, finishing projects on time and on budget."<sup>3</sup> Winston-Salem/Forsyth County's building guidelines emphasize ten core principles, all of which have reduced the cost of school construction and renovation (see Figures 1 and 2).

In addition to the "hold-the-line" philosophy noted above (Principles #1 and #2), Winston-Salem/Forsyth County's building guidelines highlight three additional themes related to sound school design. First, schools must be designed to *optimize efficiency and limit volume* (Principles #3 through #5). Larger buildings cost more to build. Therefore, schools districts must be committed to building smaller schools that comfortably hold more students in order to keep construction costs low. Second, schools districts must *use design solutions to control costs*, using less expensive materials and fixtures, building multifunctional classrooms, and providing the minimum required athletic facilities (Principles #6 through #8). Finally, all aspects of school construction and renovation must be *subject to question and rethinking* (Principles #9 and #10). It cannot be assumed that prototype building designs or conventional construction practices are the best and most cost-effective means to build and renovate schools. Put simply, the way to build cost-effective schools is to focus on function and finances, not features and frills.

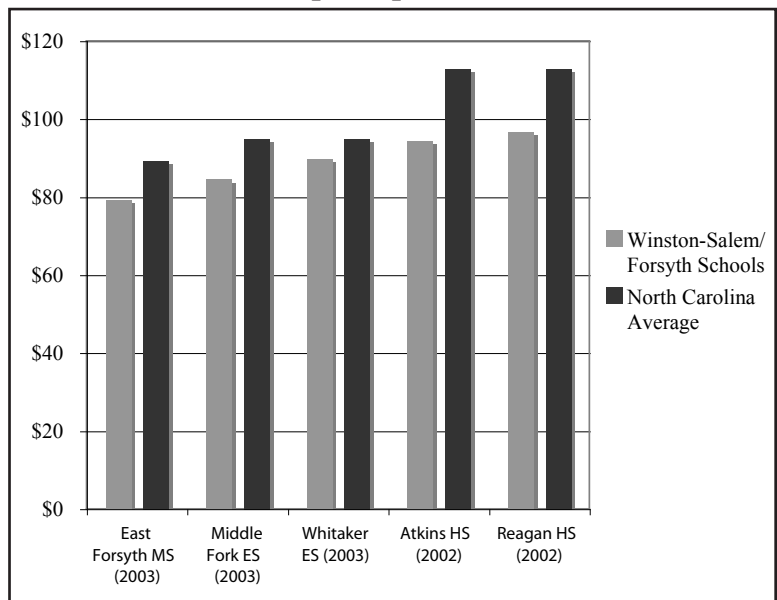
### Cost-Effective New School Construction

Abiding by their principles of cost-effective school construction, Winston-Salem/Forsyth County's cost per square foot was lower than the average cost in North Carolina (see Figure 2). Remarkably, none of the new schools bid in 2002

**Figure 1. Winston-Salem/Forsyth Schools Principles of Cost-Effective School Construction<sup>4</sup>**

1. Once the occupancy count, building size, and funding source are set, hold the line.
2. Resist wish lists and lobbying.
3. Use building designs that use space efficiency.
4. Build with smaller volume.
5. Minimize the sizes of different building components.
6. Consider lifecycle costs when choosing materials.
7. Keep site, architectural, and decorative features simple.
8. Repeat building components.
9. Question everything.
10. Always consider alternatives.

**Figure 2. New School Construction Costs (Cost per Square Foot)<sup>5</sup>**



and 2003 exceeded \$100 per square foot.

### New Elementary Schools

Winston-Salem/Forsyth County Schools spends less per school for new elementary schools than most other school districts in North Carolina. Whitaker Elementary School in Forsyth County cost \$90 per square foot to build. Charlotte-Mecklenburg's Torrence Creek Elementary School had a cost per square foot equal to that of Whitaker. Nevertheless, Union County spent \$4 more per square foot more than Forsyth County for Porter Ridge Elementary School, and Wake County spent over \$10 per square foot more for Carpenter Elementary School. The difference of a few dollars per square foot may not appear to make a significant difference between the costs of the schools, but \$4 per square foot would add \$284,456 to the cost of Whitaker Elementary School and \$10 per square foot would add \$711,140 to the cost of the school (see Table 1).

### New Middle Schools

Winston-Salem/Forsyth County's new middle schools cost between \$10 and \$15 per square foot less than middle schools in Union, Hickory, and Charlotte-Mecklenburg school districts (see Table 2). Schools in these districts were between \$1.75 and \$6 more per square foot than the average cost of middle schools in North Carolina in 2003. East Forsyth Middle School cost \$10 less per square foot than the state average middle school bid in 2003 (see Figure 2).

### New High Schools

Overhills High School in Harnett County cost slightly less per square foot than Winston-Salem/Forsyth County's Ronald Reagan High School, but it accommodates fewer students than Reagan. On the other hand, Ronald Reagan High School is over \$40 less per square foot than First Flight High School in Dare County, even though Reagan is a larger school and accommodates more students (see Table 3).

### Cost-Effective School Renovations and Additions

In 2003, worldwide increases in the demand for construction materials like steel, concrete, and petroleum produced dramatic increases in school construction and renovation costs.<sup>9</sup> Despite pressure from rising costs, Winston-Salem/Forsyth County kept its school renovation costs low. The school district was able to make interior improvements to

**Table 1. Comparison Costs: New Elementary Schools<sup>6</sup>**

	<i>Forsyth</i>	<i>Charlotte-Mecklenburg</i>	<i>Union</i>	<i>Wake</i>
School	Whitaker	Torrence Creek	Porter Ridge	Carpenter
Bid Date	2003	2003	2003	2003
Total Sq. Ft.	71,114	91,518	77,537	87,395
No. Students	720	1,000	1,000	658
Bid Cost	\$6.39 million	\$8.23 million	\$7.29 million	\$8.76 million
Sitework	Included	Included	Included	Included
Cost per Sq. Ft.	\$89.95	\$89.95	\$94.09	\$100.29

**Table 2. Comparison Costs: New Middle Schools<sup>7</sup>**

	<i>Forsyth</i>	<i>Union</i>	<i>Hickory</i>	<i>Charlotte-Mecklenburg</i>
School	East Forsyth	Porter Ridge	Hickory Middle #2	Community House
Bid Date	2003	2003	2003	2003
Total Sq. Ft.	100,643	129,000	108,355	151,083
No. Students	760	1,000	600	1,200
Bid Cost	\$7.98 million	\$10.93 million	\$10.16 million	\$14.4 million
Sitework	Included	\$829,140	Included	Included
Cost per Sq. Ft.	\$79.37	\$91.19	\$93.83	\$95.60

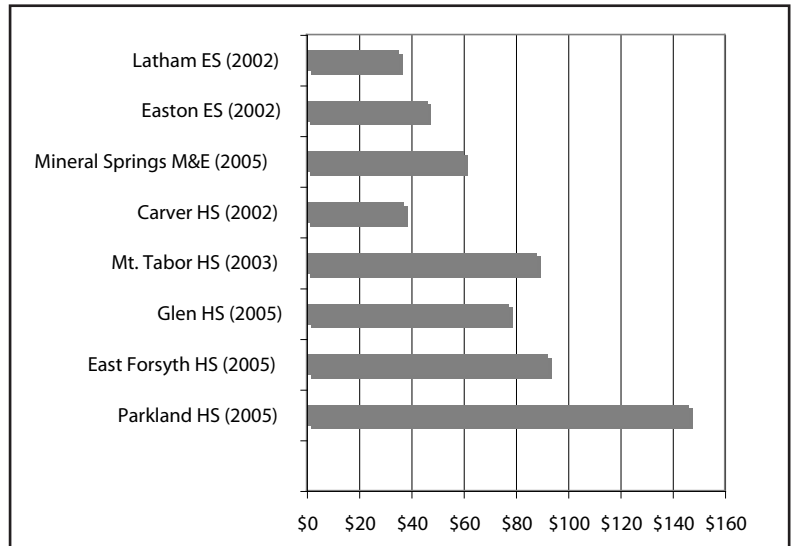
**Table 3. Comparison Costs: New High Schools<sup>8</sup>**

	<i>Forsyth</i>	<i>Harnett</i>	<i>Dare</i>
School	Ronald Reagan	Overhills	First Flight
Bid Date	2002	2002	2002
Total Sq. Ft.	194,000	231,107	182,418
No. Students	1,400	1,000	800
Bid Cost	\$18.48 million	\$21.85 million	\$20.99 million
Sitework	\$3 million	Included	\$3.8 million
Cost per Sq. Ft.	\$95.27	\$94.59	\$136.14

Latham Elementary School for \$35 per square foot and Easton Elementary School for \$46 per square foot. Renovation of the interior of Mineral Springs Middle & Elementary School, including an addition to the cafeteria/kitchen, cost \$59.53 per square foot (see Figure 3).

High school renovations are often more extensive than elementary and middle school renovations, but Winston-Salem/Forsyth County Schools kept high school renovation costs low. Carver High School cost \$37 per square foot to construct a new performing art space, to improve handicap access to athletic facilities, and renovate the exterior of the school. For \$88.18 per square foot, Mt. Tabor High School received a 26-classroom addition, an expanded media center, new administrative offices, a new auditorium, renovated restrooms, and a redesign of traffic flow on the school site. Construction of a new performing arts space and exterior improvements to Glen High School cost \$77.48 per square foot. The school district added 20 classrooms, a new media center, and school administration offices to East Forsyth High School for \$92.41 per square foot. For Parkland High School, the school district added 17 classrooms, built a new auditorium, relocated guidance counselor offices, added performing arts and dining room space, and made technology upgrades for \$146 per square foot (See Figure 3).

**Figure 3. Winston-Salem/Forsyth Schools Recent Renovation and Addition Costs (Cost per Square Foot)<sup>10</sup>**



## Conclusion

A cost-effective school construction and renovation program is only part of the answer for easing the burden on taxpayers. Any sensible strategy for accommodating school enrollment growth must also rely on alternative approaches to financing, renovating, and building schools. These include engaging in public-private partnerships, converting vacant buildings into schools, expanding school choice options, removing the cap on charter schools, redistributing lottery revenue, and removing counties' funding responsibility for Medicaid.<sup>11</sup> Taken together, these strategies will minimize school districts' dependence on large bond issues, maximize state and local revenue, and keep taxes low – all of which would be good news for taxpayers.

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## Notes

1. "Statistical Profile 1997" and "Statistical Profile 2001" North Carolina Department of Public Instruction. "Local Bond Issues Since 1995," North Carolina Department of Public Instruction, School Planning Division, November 16, 2005.
2. Jim Moorefield and Bill Powell, "2001 Bond Fund Report," Winston-Salem/Forsyth County Schools, Operations Division.
3. Sam Hieb, "Forsyth Has School Bonds Down," *Carolina Journal*, January 31, 2006.
4. "General Building Guidelines," Winston-Salem/Forsyth County Schools, Operations Division.
5. "Costs of Recent School Projects," North Carolina Department of Public Instruction, School Planning Division, November 22, 2005, pp. 1-5. "Dodge Construction Data, 2001-2003" and "Dodge Construction Data, 2003-2005" McGraw-Hill Publishers, <http://www.edfacilities.org/cd>
6. "Costs of Recent School Projects," pp. 2.
7. *Ibid.*
8. *Ibid.*, pp. 2-3.
9. Ken Simonson, "AGC's Construction Inflation Alert," The Associated General Contractors of America, 2005, <http://www.agc.org/page.wv?name=Construction+Inflation+Alert&section=Construction+Economics>
10. *Op.cit.* at note 5.
11. Terry Stoops, "Building for the Future: The School Enrollment Boom in North Carolina," John Locke Foundation *Policy Report*, [http://johnlocke.org/policy\\_reports/display\\_story.html?id=60](http://johnlocke.org/policy_reports/display_story.html?id=60)