

Making North Carolina's Teacher Salary Schedule More Effective

Report to the North Carolina General Assembly's Fiscal Research Division
and the North Carolina Department of Public Instruction

by
Lauren Akers
Sarah Cordes
Mary Kingston
Jackson Miller
Caleb Varner

Terry Sanford Institute of Public Policy
Duke University
May 1, 2009

TABLE OF CONTENTS

EXECUTIVE SUMMARY:	i
PROBLEM STATEMENT	1
CRITERIA	2
ALTERNATIVES	3
ANALYSIS	4
1. FRONT-LOAD THE SALARY SCHEDULE DURING A TEACHER'S FIRST TEN YEARS.....	4
2. FINANCIALLY REWARD TEACHERS OF MATH AND SCIENCE WHO HOLD A DEGREE IN THEIR SUBJECT AREA.	5
3. FINANCIALLY REWARD TEACHERS WITH A PRAXIS II SCORE AT LEAST 1.25 STANDARD DEVIATIONS ABOVE THE MEAN.	6
4. DOUBLE ANNUAL BONUS PAY FOR TEACHERS WORKING AT A "HARD TO STAFF" SCHOOL	7
5. REQUIRE TEACHERS WITH ZERO TO FIVE YEARS OF EXPERIENCE TO WORK YEAR-ROUND WITH 180 DAYS FOR CLASSROOM INSTRUCTION AND ONE MONTH EACH FOR PLANNING TIME AND STAFF DEVELOPMENT.	8
RECOMMENDATION	10
IDEAL SALARY SCHEDULE	10
PILOT STUDY	11
BIBLIOGRAPHY	12
APPENDIX I	14
APPENDIX II	15
APPENDIX III	20
APPENDIX IV	21
APPENDIX V	22
APPENDIX VI	23

EXECUTIVE SUMMARY¹

Which teacher characteristics should North Carolina's salary schedule reward in order to most effectively utilize existing funds?

Recommendation (page 14)

We recommend a salary schedule with:

- A \$35,000 starting salary for teachers with no experience and a Bachelors degree, equivalent to the national average for beginning teachers.
- Annual increases during the first ten steps that mirror the current salary schedule steps. After the tenth step, the annual increases would decline to 0.5%.
- Annual supplements of \$2,500 each for teachers meeting each of the following criteria (and instructing in a school that does not meet the hard to staff criteria):
 - Earning a Masters degree in math or science and teaching in that subject area.
 - Scoring at least 1.25 standard deviations above the mean on the Praxis II exam at the time of the examination.
- Doubled annual supplements of \$5,000 each for teachers working in a hard to staff school.

As a complement to the new schedule, we recommend that North Carolina require that all teachers with zero to five years of experience sign twelve-month contracts. The new contracts should have:

- 180 days of instructional time (10-months)
- 1 month allocated for professional development
- 1 month allocated for planning time

Problem Statement (page 1)

Current academic research indicates that North Carolina's salary structure fails to reward evidence-based characteristics of effective teachers. Research demonstrates that returns in teacher effectiveness from additional years of experience are likely to be highest in the early years of teaching, even when controlling for differences in student populations. Masters degrees do not appear to affect teacher quality, with the exception of Masters degrees in math and science for math and science teachers. While NBPTS certification appears to *identify* effective teachers, the process itself does not appear to improve teacher quality. Hard to staff school districts have a smaller proportion of effective teachers, and also face higher teacher

¹ *This student paper was prepared in 2009 in partial completion of the requirements for PPS 304, a course in the Masters of Public Policy Program at the Terry Sanford Institute of Public Policy at Duke University. The research, analysis, and policy alternatives and recommendations contained in this paper are the work of the student team who authored the document, and do not represent the official or unofficial views of the Terry Sanford Institute of Public Policy or of Duke University. Without the specific permission of its authors, this paper may not be used or cited for any purpose other than to inform the client organization about the subject matter. The authors relied in many instances on data provided to them by the client and related organizations and make no independent representations as to the accuracy of the data.*

turnover. Taken together, these factors leave less effective and less experienced teachers working with the most disadvantaged students. Attempts to construct a more effective teacher salary schedule are complicated by the lack of an academic or political consensus on the definitions of “high-quality teachers” and “improved student outcomes.”

Criteria (page 2)

- 1) Each of the five alternatives must meet two criteria:
 - a. Reward evidence-based characteristics of effective teachers
 - b. Satisfy stakeholders, including the state’s teachers, the North Carolina Association of Educators (NCAE), the State Board of Education, the North Carolina General Assembly, the Governor, the Department of Public Instruction, and North Carolina Superior Court Judge Howard Manning
- 2) Taken together as one proposed salary schedule, the implemented alternatives must operate within existing funds.

Alternatives (page 3)

- 1) Front-load the salary schedule during a teacher’s first ten years.
- 2) Financially reward math and science teachers who hold a degree in their subject area.
- 3) Financially reward teachers with a Praxis II score at least 1.25 standard deviations above the mean.
- 4) Double annual bonus pay for teachers working at a “hard to staff” school, as defined below:
 - a. High schools: 75 percent or higher eligibility for free/reduced lunch, less than 50 percent proficiency on English I and Algebra I tests, and more than 100 students
 - b. Middle/elementary schools: 75 percent or higher eligibility for free/reduced lunch, less than 50 percent proficiency on reading and math tests, and more than 100 students
- 5) Require teachers with zero to five years of experience to work year-round with 180 days for classroom instruction; and one month each for planning time and staff development. Teachers with more than five years experience may opt-in to the twelve-month contract.

Which teacher characteristics should North Carolina's salary schedule reward in order to most effectively utilize existing funds?

PROBLEM STATEMENT

Current academic research indicates that North Carolina's current salary structure fails to reward evidence-based characteristics of effective teachers. North Carolina's schedule currently rewards teachers based on three characteristics: years of experience, Masters degree attainment, and National Board of Professional Teaching Standards (NBPTS) certification.

The current salary schedule fails to proportionally reward teachers for the significant gains in effectiveness made in each of the first three to five years.¹ Specifically, a teacher in his first year would receive an annual raise of \$420, or 147 percent less than the \$1,040 received by a teacher in his thirty-first year. Research demonstrates that returns in teacher effectiveness from additional years of experience are likely to be highest in the early years of teaching, even when controlling for differences in student populations.² The majority of studies suggest that teachers become significantly more effective during each of the first three to five years. These findings span different grade-levels and subjects and thus appear to be robust to different teaching contexts.³ Moreover, one North Carolina study counters the argument that the increase in student outcomes with years of teacher experience merely indicates higher attrition rates of less effective teachers. The same study finds that "...teachers who stay are less effective than those who leave..."⁴

Masters degrees do not appear to affect teacher quality, with the exception of Masters degrees in math and science for math and science teachers.⁵ The literature on NBPTS certification is more inconclusive. Some studies find that while NBPTS certification *identifies* effective teachers, the process itself does not appear to improve teacher quality.⁶ Rigorous studies demonstrate "greater [differences in effectiveness among] teachers who receive the NBPTS credential than between NBPTS and non-NBPTS teachers."⁷

¹ Goldhaber, Dan . "Teachers matter, but effective teacher quality policies are elusive," in *Handbook of Research in Education Finance and Policy*, ed. Helen F. Ladd and Edward B. Fiske (New York: Routledge, 2008), 146-65.

² Clotfelter, C.T., Ladd, H.F., and Vigdor, J. "Teacher credentials and student achievement: Longitudinal analysis with student fixed effects." *Economics of Education Review* 26 (2007): 673-82.

³ Dan Goldhaber, "Teachers matter, but effective teacher quality policies are elusive," in *Handbook of Research in Education Finance and Policy*, ed. Helen F. Ladd and Edward B. Fiske (New York: Routledge, 2008), 146-65.

⁴ Clotfelter, C.T., Ladd, H.F., and Vigdor, J. "Teacher credentials and student achievement: Longitudinal analysis with student fixed effects." *Economics of Education Review* 26 (2007): 673-82.

⁵ Dan Goldhaber, "The mystery of good teaching," *Education Next*, 2.1 (2002): 5zero to five5.

⁶ Clotfelter, Ladd, and Vigdor, "Teacher credentials and student achievement: Longitudinal analysis with student fixed effects"

⁷ Dan Goldhaber, "Teachers matter, but effective teacher quality policies are elusive," in *Handbook of Research in Education Finance and Policy*, ed. Helen F. Ladd and Edward B. Fiske (New York: Routledge, 2008), 146-65.

Hard to staff school districts have a smaller proportion of effective teachers, and also face higher teacher turnover. Taken together, these factors leave less effective and less experienced teachers working with the most disadvantaged students. (See Appendix I, page 14, for more information on the current salary schedule.)

Attempts to construct a more effective teacher salary schedule are complicated by the lack of an academic or political consensus on the definitions of “high-quality teachers” and “improved student outcomes.” Even given a reliable definition of teacher quality and student outcomes, the political atmosphere surrounding pay schedule reform would remain highly contentious. Stakeholders—including government officials, policymakers, the NCAE, individual teachers, parents, students, and academics—have yet to establish an agreement on the appropriate teacher salary schedule. As a result, even evidence-based reforms must be made incrementally.

CRITERIA

- 1) Each of the alternatives must:
 - a) Reward evidence-based characteristics of effective teachers
 - b) Satisfy stakeholders, including the state’s teachers, the North Carolina Association of Educators (NCAE), the State Board of Education, the North Carolina General Assembly, the Governor, and North Carolina Superior Court Judge Howard Manning⁸
- 2) Taken together as one proposed salary schedule, the recommended alternatives must operate within existing funds

⁸ Judge Manning’s support is critical to the successful implementation of a pilot study in Halifax County.

ALTERNATIVES

- 1) Front-load teachers' earnings by increasing the starting salary to \$35,000 for teachers with a Bachelors degree, rewarding years of experience at the same rate as the current schedule between the zero and tenth step, and decreasing the annual increase to 0.5% after the tenth step.
- 2) Financially reward math and science teachers who hold a degree in their subject area.
- 3) Financially reward teachers with a Praxis II score at least 1.25 standard deviations above the mean.
- 4) Double annual bonus pay for teachers working at a "hard to staff" school.
- 5) Require teachers with zero to five years of experience to work year-round with 180 days for classroom instruction; and one month each for planning time and staff development. Teachers with more than five years experience may opt-in to the twelve-month contract.

ANALYSIS

1. Front-load teachers' earnings by increasing the starting salary to \$35,000 for teachers with a Bachelors degree and no years of experience, rewarding years of experience at the same rate as the current schedule between the zero and tenth step, and decreasing the annual increase to 0.5% after the tenth step.

According to the proposed front-loaded salary schedule, the average starting salary for an uncertified teacher with no experience and a Bachelors degree would be \$35,000, equivalent to the national average for beginning teachers. This shift represents an eighteen percent increase from the current starting salary for such a teacher. A front-loaded salary schedule rewards effective teacher characteristics by raising teacher salaries more during the years in which their marginal increase in effectiveness is greatest.

Under the current salary schedule, teachers do not reach their full earnings potential until their thirtieth year – a much longer duration than that of other professions. As a result, the “opportunity cost” of remaining in teaching (or the wages a teacher might earn in a different field) increases substantially in the first few years, driving many teachers to leave the profession for higher paying occupations.^{9 10} With high teacher turnover, North Carolina is particularly impacted by the effect of low teacher wages.¹¹ Specifically, fifty percent of teachers leave during the first seven years of their career, and more than two-thirds of those teachers exit in their first four years.¹² By increasing the starting salary and decreasing the opportunity cost of teaching, a front-loaded salary schedule would help North Carolina attract more teachers to the field and retain more effective teachers (since teachers who stay are less effective than those who leave¹³).

If implemented with a hold-harmless clause, a front-loaded salary schedule satisfies many, but not all, stakeholders. Marge Foreman, Research Specialist in Government Relations for the NCAE, supported front-loading teacher pay more than is currently done.¹⁴ Similarly, Superior Court Judge Howard Manning expressed approval of increased pay in a teacher's first ten years of her career.¹⁵ However, teachers with more than ten years of experience may oppose the idea of paying new teachers higher initial salaries. A flat rate annual

⁹ Hanushek, E. A., J. F. Kain, and S. G. Rivkin. 2004. “Why public schools lose teachers”. *Journal of Human Resources* 39, (2): 326-54.

¹⁰ Vigdor, Jaccob. 2008. “Scrap the Sacrosanct Salary Schedule.” *Education Next*, v8 n4 p36-42 Fall 2008.

¹¹ Murane, Richard J., and Randall Olsen. 1990. “The Effects of Salaries and Opportunity Costs on Length of Stay in Teaching: Evidence from North Carolina.” *Journal of Human Resources*, v25 n1 p106-24 Winter.

¹² Huling-Austin, L. (1986). “Factors to consider in alternative certification programs: What can be learned from teacher induction research?” *Action in Teacher Education*, 8(2), 51-58

¹³ Clotfelter, C.T., Ladd, H.F., and Vigdor, J. “Teacher credentials and student achievement: Longitudinal analysis with student fixed effects.” *Economics of Education Review* 26 (2007): 673-82.

¹³ Dan Goldhaber, “The mystery of good teaching,” *Education Next*, 2.1 (2002): 5zero to five5.

¹⁴ Based on in-person meeting with Marge Foreman, March 2009, DPI, Raleigh. Present: Jackson Miller, Sarah Cordes, Mary Kingston, Caleb Varner, and Lauren Akers.

¹⁵ Based on in-person meeting with Superior Court Judge Howard Manning, March 2009, Raleigh. Present: Jackson Miller, Sarah Cordes, Mary Kingston, and Caleb Varner.

supplement system might face opposition from more experienced teachers, as the supplement is a smaller percentage of their salaries.

Although potentially budget-neutral in the long-term, front-loading the schedule will require increased expenditures on teacher salaries in the short term. In addition, improved retention arising from a front-loaded salary schedule might increase overall expenditures on salaries. This cost may be justified by the retention of effective teachers.

2. Financially reward teachers of math and science who hold a degree in their subject area.

Math and science teachers who hold a degree in their respective subjects induce higher student achievement in math and science than teachers who do not hold a math or science degree.¹⁶ An increase in the number of undergraduate math courses taken by a teacher (particularly courses in math education) is correlated with higher test scores among his or her high school students.¹⁷ When measuring gains over two years, teachers with more mathematics preparation are found to have a positive effect on students with low pre-test scores.¹⁸ (See Appendix II, page 15, for more details regarding the literature on math and science Masters degrees.)

Rewarding math and science teachers with a degree in their subject area will satisfy some stakeholders. Superior Court Judge Manning advocates a more rigorous curriculum among teacher education programs and may thus support financially rewarding those who take the additional step either before or during teaching to earn a Masters degree in their subject area. The State Board of Education and the North Carolina General Assembly may support this alternative since it may attract more math and science teachers with Masters degrees. Teachers and the NCAE are unlikely to support this alternative, given that it rewards only math and science teachers.

¹⁶ Allan M. Mohrman, Jr., Susan Albers Mohrman, and Allan R. Odden, "Aligning Teacher Compensation with Systemic School Reform: Skill-Based Pay and Group-Based Performance Rewards," *Educational Evaluation and Policy Analysis* 18.1 (Spring 1996): 51-71.

¹⁷ David Monk, "Subject Area Preparation of Secondary Mathematics and Science Teachers and Student Achievement," *Economics of Education Review*, 13.2 (1994): 125-145.

¹⁸ David Monk and Jennifer A. King, (1994). "Multilevel Teacher Resource Effects on Pupil Performance in Secondary Mathematics and Science: The Case of Teacher Subject-matter Preparation," in *Choices and Consequences: Contemporary Policy Issues in Education*, ed. Ronald G. Ehrenberg (Ithaca, NY: ILR Press): 29-58.

3. Financially reward teachers with a Praxis II score at or above 1.25 standard deviations above the mean.

Studies consistently demonstrate a positive association between measures of teacher academic proficiency and student achievement.¹⁹ Several recent studies demonstrate a small but significant relationship between teacher performance on licensure exams (such as the Praxis tests used in North Carolina) and student achievement. These studies find that teachers with high scores have large effects on student achievement relative to the average teacher.²⁰ One potential problem is that by rewarding based on Praxis scores, this alternative may reward a small number of ineffective teachers and exclude a small percent of effective teachers from receiving the bonus. (See Appendix II, page 15, for further details regarding the literature on teacher licensure examinations.)

Rewarding Praxis scores will satisfy some, but not all, stakeholders. Judge Manning expressed an interest in raising the licensure standards in general, and so likely would support this alternative. It will likely meet resistance from the NCAE and some teachers, particularly because minority teachers disproportionately score lower on standardized tests.²¹ However, teachers may accept this alternative because it rewards teachers across grade levels and disciplines.

By rewarding teachers 1.25 standard deviations above the mean, bonuses will only be offered to about thirteen percent of teachers statewide. These bonuses can be paid for partially through funds currently used to reward Masters degrees.

¹⁹ Dan Goldhaber, "Why do we license teachers?," in *A qualified teacher in every classroom: Appraising old answers and new ideas*, ed. F. Hess, A. Rotherham, and K. Walsh (Cambridge: Harvard Education Press, 2004), 81-100.

²⁰ Clotfelter, C.T., Ladd, H.F., and Vidgor, J. "Teacher credentials and student achievement: Longitudinal analysis with student fixed effects." *Economics of Education Review* 26 (2007): 673-82.

²¹ Interview with Jo Ann Norris, N.C. Public School Forum.

4. Double annual bonus pay for teachers working at a “hard to staff” school, as defined below:

a. High schools: At least 75 percent of students eligible for free/reduced lunch, less than 50 percent proficiency on English I and Algebra I tests, and more than 100 students

b. Middle/elementary schools: At least 75 percent of students eligible for free/reduced lunch, less than 50 percent proficiency on reading and math tests, and more than 100 students

While there is no standard definition of “hard to staff” schools, research indicates that teachers are less likely to choose to work at schools with the combination of low academic performance, high poverty, and a high percentage of minority students. Teacher turnover is highest among high poverty, high minority schools, further strengthening the correlation between hard to staff schools and children who are members of racial or ethnic minorities and/or eligible for free or reduced-price lunch.²² Minority and lower income students are overrepresented at hard to staff schools and so disproportionately affected by teacher turnover, causing educational inequity for these students.²³

When polled in March 2000, sixty-nine percent of teachers in North Carolina said that if given the opportunity, they would not volunteer to work in a low-performing school, indicating that financial incentives may be necessary to recruit teachers to hard to staff schools.²⁴ Research suggests that monetary incentives have effectively reduced teacher turnover, allowing school systems to fill teacher vacancies and improving student performance.²⁵ Despite this research, it remains unclear how this bonus might likely affect teacher staffing issues in rural areas versus those in urban districts. Additionally, the effectiveness of hard to staff bonuses will vary depending on individual school characteristics. (See Appendix II, page 15, for a more detailed discussion regarding the literature on hard to staff schools.)

Key stakeholders express support of a hard to staff pay bonus in targeted North Carolina schools. Superior Court Judge Manning and NCAE Research Specialist Marge Foreman each concurred that teachers willing to work in traditionally hard to staff schools deserve an annual bonus, though neither offered a specific bonus amount.²⁶

²² Johnson, Susan M., Berg, Jill H. & Donaldson, Morgaen L. (2005). *Who stays in teaching and why: A review of the literature on teacher retention*. The Project on the Next Generation of Teachers, Harvard Graduate School of Education, http://assets.aarp.org/www.aarp.org/articles/NRTA/Harvard_report.pdf

²³ Ibid.

²⁴ Prince, Cynthia D. “Higher Pay in Hard-to-Staff Schools: The Case for Financial Incentives,” *American Association of School Administrators*, June 2002, accessed online: http://www.aasa.org/files/PDFs/Publications/higher_pay.pdf

²⁵ Prince, Cynthia D, "Higher Pay in Hard to Staff Schools: The Case for Financial Incentives", *American Association of School Administrators*, June 2002, http://www.aasa.org/files/PDFs/Publications/higher_pay.pdf

²⁶ Based on in-person meetings with Marge Foreman and Judge Manning, March 2009, DPI, Raleigh. Present: Jackson Miller, Sarah Cordes, Mary Kingston, Caleb Varner.

On the national scale, the American Federation of Teachers supports “targeted incentives and options” for teachers “interested in moving to hard to staff schools,” suggesting that pay incentives to teach at these schools would receive support from this union.²⁷ While only a few districts across North Carolina currently offer monetary incentives to teach at hard to staff schools, statements of support from key stakeholders indicate that monetary incentives for hard to staff schools could be politically feasible.²⁸ However, some experts argue that hard to staff schools should focus spending in areas besides teacher salaries in an attempt to reduce teacher turnover. Proponents of this argument contend that such improvements will address the core staffing issues for teachers more effectively than would increased salary. While this may be true, such improvements have a more long-term focus, and during the implementation delay, students would continue to suffer from frequent teacher turnover.²⁹

In order to implement this bonus system, funding could be diverted from the current bonuses dedicated to advanced degree holders or NBPTS certified teachers. Alternatively, Disadvantaged Student Supplemental Fund (DSSF) could defray additional costs if the alternative were piloted in one of North Carolina’s hard to staff districts.

5. Require teachers with zero to five years of experience to work year-round with 180 days for classroom instruction and one month each for planning time and staff development. Teachers with more than five years experience may opt-in to the twelve-month contract.

Employing teachers for an additional two months gives administrators the flexibility to implement evidence-based strategies that develop and improve effective teacher characteristics. The time constraints imposed by ten-month teacher contracts do not allow for effective, content-specific professional development and mentoring programs for new teachers³⁰. On the other hand, twelve-month contracts will give teachers the time needed to maximize the benefits from professional development and mentoring programs. (See Appendix II, page 15, more information regarding the research on the effectiveness of professional development.)

Twelve-month teacher contracts would likely garner support from key stakeholders such as the NCAE, the North Carolina Legislature, the leadership of the Department of Public Instruction (DPI), and teachers. NCAE will support this alternative because it will bolster

²⁷ McElroy, Edward J. et al, “Meeting the Challenge: Recruiting and Retaining Teachers in Hard to Staff Schools,” *American Federation of Teachers*, June 2007, http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/30/b2/fb.pdf

²⁸ Glennie, Elizabeth, and Justin Wheeler, “Can Pay Incentives Improve the Recruitment and Retention of Teachers in America’s Hard-To-Staff Schools? A Research Summary.” *Policy Matters*, Center for Child and Family Policy, Duke University, Summer 2007, accessed online: http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/37/0f/2d.pdf

²⁹ McElroy, Edward J. et al, “Meeting the Challenge: Recruiting and Retaining Teachers in Hard to Staff Schools,” *American Federation of Teachers*, June 2007, http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/30/b2/fb.pdf

³⁰ Herbert G. Heneman III, Anthony Milanowski, and Steven Kimball. 2007. Teacher Performance Pay: Synthesis of Plans, Research, and Guidelines for Practice. *Research in Education Policy and Finance*

teacher salaries and professionalize the industry. Additionally, according to a 2006 survey conducted by the NC DPI, fifty-six percent of teachers support moving to twelve-month contracts if one month were devoted to professional development.³¹ The NC Legislature will likely support expanding teacher contracts because they will not oppose a policy that the majority of their constituency supports. Philip Price, the DPI's Chief Financial Officer, will support the implementation of twelve-month teacher contracts because it will increase teacher salaries and provide more time for training North Carolina's less experienced teacher workforce. Finally, data from a 2006 survey conducted by the DPI on teacher receptiveness to twelve-month teacher contracts indicate that new teachers would not favor the policy change.³² Thus, those who oppose the shift to twelve-month contracts would contend that such a policy shift would make the difficult task of hiring quality teachers more arduous.

Additional funding would be needed to offer twelve-month contracts to all of North Carolina's teachers with zero to five years of experience. However, if the policy option were piloted in one of North Carolina's "hard to staff" districts, then other funding streams such as DSSF could support the additional cost.

³¹ Presented by Jackson Miller of DPI to the State Board of Education, 2006.

³² Presented by Jackson Miller of DPI to the State Board of Education, 2006.

RECOMMENDATION

Ideal Salary Schedule

While each alternative could be implemented separately or in combination with any other alternatives, we recommend a salary schedule that incorporates all five alternatives. The recommended salary schedule removes the current schedule's rewards for advanced degrees, and uses the additional funds to front-load the schedule.

We recommend a salary schedule with:

- A \$35,000 starting salary for teachers with no experience and a Bachelors degree, equivalent to the national average for beginning teachers.³³
- Annual increases during the first ten steps that mirror the current salary schedule steps. After the tenth step, the annual increases would decline to 0.5%.
- Annual supplements of \$2,500 each for teachers meeting each of the following criteria (and instructing in a school that does not meet the hard to staff criteria):
 - Earning a Masters degree in math or science and teaching in that subject area.
 - Scoring at least 1.25 standard deviations above the mean on the Praxis II exam at the time of the examination.
- Doubled annual supplements of \$5,000 each for teachers working in a hard to staff school.

As a complement to the new schedule, we recommend that North Carolina require that all teachers with zero to five years of experience sign twelve-month contracts. The new contracts should have:

- 180 days of instructional time (10-months)
- 1 month allocated for professional development
- 1 month allocated for planning time

If implemented on a statewide basis with a hold-harmless clause, the new salary schedule would create an annual deficit of approximately \$256 million. However, North Carolina could reduce the cost and reward empirically based teacher characteristics by eliminating the front-loaded portion of our schedule and keeping the recommended supplement structure. In addition, we recommend the removal or reduction of NBPTS bonuses to help support the additional short term costs. A hold harmless" or "opt-in" clauses would likely make this option more politically feasible. (See Appendix IV, page 21, for cost analysis of the proposed salary schedule.)

³³ The \$35,000 national average for beginning teachers includes teachers on the traditional ten-month contract, as well as those on eleven- and twelve-month contracts.

Pilot Study

Immediate implementation of the recommended salary schedule would face numerous challenges. While a front-loaded salary schedule and twelve-month contract draw on evidence-based logic models, explicit empirical evidence of their effects is limited. Moreover, we have a limited understanding of how the simultaneous implementation of the alternatives might cause them to interact with one another and any unintended consequences they might produce. Before increasing spending on the salary schedule at the state-level, stakeholders will want assurance that the schedule will actually work.

We recommend an initial pilot of the modified salary schedule before a full-scale implementation is considered. Ideally, we would eliminate biases in our study of the new schedule's effects by randomly assigning each of the state's LEAs to either a treatment or control group. However, such a design is infeasible on political, practical, and ethical grounds.

As a more politically and practically feasible option, we recommend piloting the salary schedule in two districts – one rural, low-performing district such as Halifax County, and one urban district with both low- and high-performing schools. Each of the two treatment districts should be compared to at least two otherwise similar control districts. Control districts could be selected based on either geographic considerations or by matching student characteristics. By implementing the pilot in both a rural and urban district, evidence of the salary schedule's effects could be generalized to other districts. While determining the duration of the possible pilot falls outside of the scope of this document, a long-term study is preferable. However, the duration of the pilot will depend on available resources and political pressures.

BIBLIOGRAPHY

Borko, H., *Professional Development and Teacher Learning: Mapping the Terrain*. Boulder University of Boulder (2008).

Clotfelter, C.T., Ladd, H.F., and Vidgor, J. "Teacher credentials and student achievement: Longitudinal analysis with student fixed effects." *Economics of Education Review* 26 (2007): 673-82.

Clotfelter, Charles, et al, "Would Higher Salaries Keep Teachers in High-Poverty Schools? Evidence from a Policy Intervention in North Carolina," National Bureau of Economic Research Working Paper No. 12285, June 2006, JEL No. I2, J33, J45 "Would Higher Salaries Keep Teachers in High-Poverty Schools?"

Department of Public Instruction, "Fiscal Year 2008-2009 N.C. Public School Salary Schedules. Financial and Business Services, N.C. Department of Public Instruction". <http://www.ncpublicschools.org/fbs/finance/salary>

Foreman, Marge. March 2009, DPI Interview, Raleigh. Interviewed by Jackson Miller, Sarah Cordes, Mary Kingston, Caleb Varner.

Goldhaber, Dan. "Everyone's doing it, but what does teacher testing tell us about teacher effectiveness?" *Journal of Human Resources* 42(2007): 765-94.

Goldhaber, Dan. "Teachers matter, but effective teacher quality policies are elusive," in *Handbook of Research in Education Finance and Policy*, ed. Helen F. Ladd and Edward B. Fiske (New York: Routledge, 2008), 146-65.

Goldhaber, Dan. "The mystery of good teaching," *Education Next*, 2.1 (2002): 5zero to five5. Preparation," in *Choices and Consequences: Contemporary Policy Issues in Education*, ed. Ronald G. Ehrenberg (Ithaca, NY: ILR Press): 29-58.

Goldhaber, Dan. "Teacher licensure tests and student achievement: Is teacher testing an effective policy?" in *Learning from Longitudinal Data in Education*, eds. Duncan Chaplin and Jane Hannaway (Washington, D.C.: Urban Institute Press, forthcoming).

Goldhaber, Dan. "Why do we license teachers?," in *A qualified teacher in every classroom: Appraising old answers and new ideas*, ed. F. Hess, A. Rotherham, and K. Walsh (Cambridge: Harvard Education Press, 2004), 81-100.

Heneman III, Herbert G., Milanowski, Anthony and Kimball, Steven. (2007). Teacher Performance Pay: Synthesis of Plans, Research, and Guidelines for Practice. *Research in Education Policy and Finance*

Hanushek, E. "The trade-off between child quantity and quality." *Journal of Political Economy* 100(1992): 84-117.

Hanushek, E. A., Kain, J. F. , and Rivkin, S. G. 2004. "Why public schools lose teachers." *Journal of Human Resources* 39, (2): 326-54.

Hanushek, E. A., J. F. Kain, and S. G. Rivkin. 2004. Why public schools lose teachers. *Journal of Human Resources* 39, (2): 326-54.

Huling-Austin, L. (1986). "Factors to consider in alternative certification programs: What can be learned from teacher induction research?" *Action in Teacher Education*, 8(2), 51-58

Glennie, Elizabeth, and Wheeler, Justin. "Can Pay Incentives Improve the Recruitment and Retention of Teachers in America's Hard-To-Staff Schools? A Research Summary." *Policy Matters*, Center for Child and Family Policy, Duke University, Summer 2007, accessed online:

http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/37/0f/2d.pdf

McElroy, Edward J. et al, "Meeting the Challenge: Recruiting and Retaining Teachers in Hard to Staff Schools," *American Federation of Teachers*, June 2007, http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/30/b2/fb.pdf

Miller, Jackson. Presentation, DPI to the State Board of Education, Raleigh, NC. 2006.

Murane, Richard J., and Randall Olsen. 1990. "The Effects of Salaries and Opportunity Costs on Length of Stay in Teaching: Evidence from North Carolina." *Journal of Human Resources* , v25 n1 p106-24 Winter.

Prince, Cynthia D. "Higher Pay in Hard-to-Staff Schools: The Case for Financial Incentives," *American Association of School Administrators*, June 2002, accessed online: http://www.aasa.org/files/PDFs/Publications/higher_pay.pdf

SERVE Center, University of North Carolina at Greensboro, "Teacher Retention at Low-Performing Schools," *Using the Evidence*, December 2006, accessed online: http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/34/f0/3d.pdf

Vigdor, Jacob. 2008. "Scrap the Scrap the Sacrosanct Salary Schedule." *Education Next*, v8 n4 p36-42 Fall 2008.

APPENDIX I: North Carolina's Current Salary Schedule

Teacher salaries constitute the largest single item in the state budget. Currently, teachers are paid on a single salary schedule that includes three elements:

- Annual percent raises for years of experience that vary with a teacher's position on the salary schedule, with slightly higher increases—in percent terms—in years three through seven.
- A ten percent bonus for attainment of a Masters or other advanced degree, with an additional \$126/month for teachers working on a doctorate degree and an additional \$253/month for attainment of a doctorate degree.
- A twelve percent bonus for receipt or renewal of National Board of Professional Teaching Standards (NBPTS) certification available after year three of teaching.

As opposed to a uniform grant for all teachers, first-year teachers are given an advanced degree bonus of \$3,040. At the last step of the salary schedule, however, teachers are awarded \$5,781 – a 90 percent increase over first-year teachers. Forty-one percent of teachers have seven years' experience or fewer, and yet that contingent receives only nine percent of all NBPTS outlays.

Not including local supplements, the average starting salary for an uncertified teacher with no experience and a Bachelors degree is \$30,430. Average salary for a North Carolina teacher is \$43,348 without local supplements.³⁴

Salaries are based on a 10-month contract with 180 teaching days. Though teacher-training programs offered as professional development are available in the summer months, teachers are not currently mandated to attend any training programs outside of those conducted specifically for their schools or mandated by administrators.³⁵

²⁶ Fiscal Year 2008-2009 N.C. Public School Salary Schedules. Financial and Business Services, N.C. Department of Public Instruction. Available online: www.ncpublicschools.org/fbs/finance/salary

³⁵ Stated in Policy Manual from DPI website, <http://www.dpi.state.nc.us/>

APPENDIX II: Literature Review

Math and Science Masters Degrees

Math and science teachers who have a degree in their subject areas show higher student test scores than math and science teachers who do not.³⁶ For teachers of subjects other than science and math, however, the effect of having an advanced degree in that subject field does not appear to increase student achievement.³⁷

One study shows that math teachers with a BA or MA in math had a positive and statistically significant effect on student's math scores when compared with math teachers without such a degree. The effect of having a BA or MA in science was also positive (although by a smaller amount) and statistically significant. There was no statistically significant impact for having a subject specific degree for teachers of English or social studies.

The study's authors also tested to see if having a degree in math or science was merely a proxy for teacher quality rather than a specific characteristic associated with student achievement. This examination revealed that this was not the case. According to the model, the effect of having a math degree is to increase 10th grade math scores about 5 percent of a standard deviation, with an even smaller effect shown in science.

A separate study examined the correlation between the number of courses taken in math and science and student achievement. The authors find a positive relationship between number of math courses taken at undergraduate level and both sophomore and junior test scores. There is also a positive relationship between the number of courses taken at the graduate level and student scores. This effect is larger for junior year. For a teacher of high school juniors with a modest level of math training (five semesters or fewer), the effect of taking an additional math course is a score increase of 1.2 percent. For sophomores, a smaller increase of 0.2 percent was detected. Though initially positive, the favorable effect of each additional math course on student test scores decreases after five courses.

The type of math course also appears to make a difference. For example, undergraduate courses in math education have a larger positive effect on student scores than courses in math, possibly because math education courses integrate pedagogical skills as well as math skills. With regard to the science subjects, undergraduate courses in physical science and graduate courses in life science correlate with higher student test scores for science teachers, while undergraduate courses in life sciences appears to have no effect. Effects of taking physical science courses are enhanced by supplemental training in mathematics.³⁸

One final study on the effects of math and science degrees examines subgroup impacts on students with high pre-test scores (scoring high on their beginning-of-the-year diagnostic

³⁶ Allan M. Mohrman, Jr., Susan Albers Mohrman, and Allan R. Odden, "Aligning Teacher Compensation with Systemic School Reform: Skill-Based Pay and Group-Based Performance Rewards," *Educational Evaluation and Policy Analysis* 18.1 (Spring 1996): 51-71.

³⁷ Dan Goldhaber, "The mystery of good teaching," *Education Next*, 2.1 (2002): 5zero to five5.

³⁸ David Monk, "Subject Area Preparation of Secondary Mathematics and Science Teachers and Student Achievement," *Economics of Education Review*, 13.2 (1994): 125-145.

test) versus low pre-test scores (scoring low at the beginning of the year). The authors find a small positive effect of teacher preparation in mathematics only for high pre-test students in their sophomore year. When measuring gains over two years, however, the positive effect of teachers with more mathematics preparation is limited to the low pre-test students.³⁹

Two concerns arise when rewarding Masters degrees in math and science. First, some studies show that an advanced degree or knowledge of a subject only has an effect for those teaching advanced courses, such as the A.P. high school curriculum. However, elementary school teachers do not gain effectiveness with a certification or degree attainment in a particular subject area.⁴⁰ Second, the value of a Masters degree varies depending on timing: teachers who earn a Masters more than five years after they start teaching appear to be somewhat less effective on average than those who do not have a graduate degree at all.⁴¹

Teacher Performance on Praxis

More effective teachers score higher on some types of standardized test (e.g., a licensure or SAT test). For instance, increasing the distribution of teacher test scores by one standard deviation increases student achievement by ten to twenty-five percent.⁴² However, the findings from this study may overestimate the effect of teacher academic proficiency on student achievement, as student test scores were not disaggregated to examine the impact on various subgroups.⁴³

Using *disaggregated* data, several recent papers demonstrate a smaller but significant relationship between teacher performance on licensure exams (such as the Praxis tests used in North Carolina) and student achievement. For example, in their study of fifth grade students, Clotfelter et al. found that a 1 standard deviation increase in a teacher's average Praxis score predicted a 1.1 percent of a standard deviation increase in reading scores and a 1.8 percent of a standard deviation increase in math scores.⁴⁴ Similarly, Goldhaber found a positive relationship between a teacher's performance on state licensure tests and student achievement in grades four through six.⁴⁵ Finally, Goldhaber also found that a 1 standard deviation increase in teacher test scores increases student test scores by 1 to 4 percent in

³⁹ David Monk and Jennifer A. King, (1994). "Multilevel Teacher Resource Effects on Pupil Performance in Secondary Mathematics and Science: The Case of Teacher Subject-matter Preparation," in *Choices and Consequences: Contemporary Policy Issues in Education*, ed. Ronald G. Ehrenberg (Ithaca, NY: ILR Press): 29-58.

⁴⁰ Dan Goldhaber, "Teachers matter, but effective teacher quality policies are elusive," in *Handbook of Research in Education Finance and Policy*, ed. Helen F. Ladd and Edward B. Fiske (New York: Routledge, 2008), 146-65.

⁴¹ Clotfelter, Ladd, and Vidor, Teacher credentials and student achievement: Longitudinal analysis with student fixed effects

⁴² Dan Goldhaber, "Teachers matter, but effective teacher quality policies are elusive," in *Handbook of Research in Education Finance and Policy*, ed. Helen F. Ladd and Edward B. Fiske (New York: Routledge, 2008), 146-65.

⁴³ *IBID*

⁴⁴ Clotfelter, C.T., Ladd, H.F., and Vidgor, J. "Teacher-student matching and the assessment of teacher effectiveness." *Journal of Human Resources* 41(2006): 778-820.

⁴⁵ Goldhaber, D. "Everyone's doing it, but what does teacher testing tell us about teacher effectiveness?" *Journal of Human Resources* 42(2007): 765-94.

grades three through five. Goldhaber notes, “Neither of the above papers, however, explores whether licensure tests are differentially predictive of teacher quality at different points in the test distribution, or account for the possibility that sample selection or nonrandom attrition from the teacher labor market may bias the results.”⁴⁶

Clotfelter *et al.* used data derived from the North Carolina Education Research Data Center to explore the relationship between teacher credentials and student achievement while controlling for student fixed effects (which overcomes the bias that teachers with stronger credentials tend to be matched at both the school and classroom level with students who are more educationally advantaged). Using test scores from the Elementary Education or Early Childhood Education test and another test focused on content, the authors examined the relationship between teacher test scores and student achievement. They found that higher average test scores are associated with higher math and reading achievement, with far larger effects for math.⁴⁷ The authors concluded, “Specifically, having a teacher at one of the extremes of the distribution has big effect on achievement relative to having an average teacher.”

Also using data housed at the North Carolina Education Research Data Center, Goldhaber linked teachers to individual students in grades three through six over a ten-year period (1994-95 through 2003-04) to examine the relationship between teacher testing and teacher effectiveness as measured by value-added contributions to student learning gains. Goldhaber accounted for the nonrandom distribution of teachers across schools and classrooms as well as the nonrandom attrition of teachers from the work force, factors that might otherwise bias estimates. His findings indicate that raising licensure standards to the higher standard required by Connecticut would exclude less than 0.5 percent of very ineffective teachers, but would also exclude seven percent of effective teachers from the teaching pool.⁴⁸

Hard to Staff Schools

The definition of a “hard to staff” school varies among academic circles. However, minority, disadvantaged, and struggling students are more likely to be enrolled in hard to staff schools. Sixty-two percent of students in hard to staff schools are ethnic minorities, compared to 39 percent of the students in other schools.⁴⁹ The study also reported that 47 percent of students in hard to staff schools were eligible for free or reduced-price lunch compared with 35 percent in other schools, showing that poorer students are concentrated in hard to staff schools.

Case studies from various school districts suggest bonus pay for teachers at hard to staff

⁴⁶ Goldhaber, D. “Teacher licensure tests and student achievement: Is teacher testing an effective policy?” in *Learning from Longitudinal Data in Education*, eds. Duncan Chaplin and Jane Hannaway (Washington, D.C.: Urban Institute Press, forthcoming).

⁴⁷ Clotfelter, C.T., Ladd, H.F., and Vidgor, J. “Teacher credentials and student achievement: Longitudinal analysis with student fixed effects.” *Economics of Education Review* 26 (2007): 673-82.

⁴⁸ Goldhaber, D. “Everyone’s doing it, but what does teacher testing tell us about teacher effectiveness?” *Journal of Human Resources* 42(2007): 765-94.

⁴⁹ SERVE Center, University of North Carolina at Greensboro, “Teacher Retention at Low-Performing Schools,” *Using the Evidence*, December 2006, accessed online: http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/34/f0/3d.pdf

schools can effectively recruit and retain teachers. When the Chattanooga, TN, district used pay incentives to attract teachers in nine underperforming elementary schools, vacancies dropped from thirty to two in one year even after the city dismissed one hundred low-performing teachers. Proficiency levels in reading among third graders in each of these nine schools increased by as much as ten percent. Similarly, teacher attrition in Caroline County, VA, fell from sixty in 2004 to two in 2005 after the implementation of a pay incentive program.⁵⁰ This evidence shows that pay incentives to teach in hard to staff schools can also retain teachers by reducing turnover at these schools.

Beginning in 2001, North Carolina awarded certified math, science, and special education teachers working in high-poverty or academically failing schools an annual bonus of \$1,800 over three years. Results show that the pay bonus helped reduce mean turnover rates of the targeted teachers by twelve percent.⁵¹ The program could have reduced turnover in these schools by even more if the state had fully educated teachers and principals of the eligibility criteria. In 2003-04, seventeen percent of principals in schools with the program did not know their schools had ever been eligible, and thirteen percent of teachers receiving the program that year did not know they were eligible.⁵²

Professional Development

According to research, in order to be effective, professional development must be content specific (i.e. focused strictly on one subject), require teachers to attend trainings for 75 to 100 hours per year (spread throughout the year), and incorporate interaction among teachers into the lessons.⁵³ Furthermore, professional development classes must emphasize the importance of understanding the student learning process by encouraging teachers to debate pedagogical strategies, and share their experiences regarding specific classroom challenges (i.e. instructing an ADHD child).⁵⁴ However, teachers in the United States average only 8 hours per year of professional development on effective methods for teaching mathematics and 5 hours per year on methods for delivering reading instruction. Moreover, high school teachers receive fewer than 24 hours per year of content-specific professional development in their area of expertise. Thus, teachers do not receive as many hours of customized professional development as research indicates that they need in order to improve the pedagogical strategies in their subject area.

While this policy alternative draws on an evidence-based logic model, direct empirical evidence of its effects is difficult to identify. Because few teacher training programs have been implemented consistently on a large scale, it is difficult to identify specific characteristics that define a successful program. Most studies on teacher training programs

⁵⁰ Wheeler, Justin, and Elizabeth Glennie, "Can Pay Incentives Improve the Recruitment and Retention of Teachers in America's Hard-To-Staff Schools? A Research Summary." *Policy Matters*, Summer 2007, Center for Child and Family Policy, Duke University

⁵¹ Clotfelter, Charles, et al, "Would Higher Salaries Keep Teachers in High-Poverty Schools? Evidence from a Policy Intervention in North Carolina," National Bureau of Economic Research Working Paper No. 12285, June 2006, JEL No. I2, J33, J45

⁵² *IBID*

⁵³ Herbert G. Heneman III, Anthony Milanowski, and Steven Kimball. 2007. Teacher Performance Pay: Synthesis of Plans, Research, and Guidelines for Practice. *Research in Education Policy and Finance*

⁵⁴ Borko, Hilda. 2008. Professional Development and Teacher Learning: Mapping the Terrain. Boulder University of Boulder, CO.

suffer from internal and external validity problems due to their limited scopes. Currently, since there is little research on the topic and the administration of professional development is inconsistent, it remains unclear how to best allocate the 75-100 hours of training.

According to the survey cited above, teachers would prefer an 11-month schedule to the proposed mandated twelve-month schedule for a few reasons. Teachers are uncertain as to what the additional month would entail (i.e. more staff development). Second, teachers want to retain their two months of summer vacation. Implementing an 11-month schedule, however, would also confront some political opposition. Critics argue that adding an additional month to the contract will require additional funds for professional development, but would also attract additional talent into the profession because the timeline would compare to other “professional” occupations.

APPENDIX III: Teacher Survey Results

A survey was designed and distributed to teachers to determine teacher attitudes toward various aspects of the proposed teacher salary schedule. In particular, the survey focused on asking teachers about their attitudes towards bonuses for teaching in hard to staff schools and their willingness to work under a twelve month contract. In all, 6,716 teachers responded to the survey from across the state. Of these, a little over 20 percent were on steps 0-5 of the current salary schedule, approximately 45 percent were on steps 6-19, and 32 percent were on step twenty or above. Slightly less than 40 percent of respondents were elementary school teachers, and over 50 percent taught middle or high school.

Of the teachers who responded to the question, 58.7 percent indicated a willingness to accept a twelve month contract for additional pay. Of these, slightly less than one fourth (23.5 percent) were on steps 0-5 of the salary schedule and 16.9 percent were on steps 6-10. The vast majority, 59.6 percent, were on step 11 of the salary schedule or above. Interestingly, this trend was very similar for those teachers who indicated they would not be willing to accept a twelve month contract. Of those teachers, 18 percent were on steps 0-5, 18 percent on steps 6-10, and 64 percent on step 11 or above. In summary, of those who support a twelve month teacher contract, the majority are experienced teachers. Of those who do not support a twelve month contract, the majority are also experienced teachers. In addition, there is a slightly smaller proportion of newer teachers who oppose the twelve month contract than support it.

Of those teachers who responded to the survey, 63.6 percent said they either “strongly agreed” or “agreed” that teachers at hard to staff schools should be paid higher salaries. Of these teachers, 22.8 percent were on steps 0-5 of the salary schedule, 17.4 percent were on steps 6-10, and 59.6 percent were on step 11 or above. Additionally, these teachers show a slightly higher willingness to accept a twelve month contract, with 62.7 percent saying they were willing to accept such a contract. 23.2 percent of teachers said that they either “strongly disagreed” or “disagreed” that teachers at hard to staff schools should be paid higher salaries. Only 15.3 percent of those teachers were on step 0-5, 16.4 percent were on step 6-10, and 68.7 were on step 11 or above. Of survey respondents, it appears that more experienced teachers tend to disagree with paying bonuses for working at hard to staff schools.

**APPENDIX IV:
Salary Schedule Cost Calculations**

Table 1: Total Cost to Front Load the Schedule and Provide Supplements Statewide			
	Less Masters / NBPTS	Less Masters/5% NBPTS	Less Masters /12%NBPTS
Without Hold Harmless	\$ 4,743,677,534	\$ 4,772,609,178	\$ 4,813,114,392
With Hold Harmless	4,746,152,275	4,775,083,919	4,815,589,133

*Beginning Teacher Salaries Starting at \$35,000

**Additional Pay Differentiated on a hard to staff index: non hard to staff/hard to staff

Table 2: Additional Money Required to Front Load the Schedule and Provide Supplements			
	Less Masters/ NBPTS	Less Masters/5% NBPTS	Less Masters /12%NBPTS
Without Hold Harmless	\$ 184,182,347	\$ 213,113,991	\$ 253,619,205
With Hold Harmless	186,657,088	215,588,732	256,093,946

*Beginning Teacher Salaries Starting at \$35,000

**Additional Pay Differentiated on a hard to staff index: non hard to staff/hard to staff

Table 3: Costing for a Halifax Pilot of Proposed Schedule			
	Less Masters / NBPTS	Less Masters /5% NBPTS	Less Masters /12%NBPTS
Total Cost	\$ 15,055,281	\$ 15,113,801	\$ 15,195,689
Additional Cost	439,839	498,359	580,247

*Beginning Teacher Salaries Starting at \$35,000

**Additional Pay Differentiated on a hard to staff index: non hard to staff/hard to staff

APPENDIX V: Hard to Staff High Schools

#	LEA #	School #	LEA Name	School Name
1	80	312	Bertie County Schools	Bertie High
2	100	308	Brunswick County Schools	Brunswick County Academy
3	230	330	Cleveland County Schools	Davidson School
4	260	359	Cumberland County Schools	E E Smith High
5	310	352	Duplin County Schools	James Kenan High
6	320	341	Durham Public Schools	Lakeview School
7	340	700	Forsyth County Schools	Sch Computer Technology Atkins
8	420	358	Halifax County Schools	Southeast Halifax High
9	422	324	Weldon City Schools	Weldon High
10	450	343	Henderson County Schools	Balfour Education Center
11	600	396	Charlotte-Mecklenburg Schools	Garinger High
12	600	386	Charlotte-Mecklenburg Schools	Hawthorne High School/TAPS
13	600	375	Charlotte-Mecklenburg Schools	Midwood High
14	650	354	New Hanover County Schools	Lakeside
15	660	324	Northampton County Schools	Northampton High West
16	780	391	Robeson County Schools	Red Springs High
17	900	365	Union County Public Schools	South Providence
18	910	364	Vance County Schools	Southern Vance High
19	910	368	Vance County Schools	Western Vance High

APPENDIX VI: Hard to Staff Elementary/Middle Schools

#	LEA #	School #	LEA Name	School Name
49	240	376	Columbus County Schools	Tabor City Middle
50	240	372	Columbus County Schools	Tabor City Elementary
51	240	344	Columbus County Schools	Evergreen Elementary
52	240	354	Columbus County Schools	Hallsboro-Artesia Elementary
53	250	360	Craven County Schools	Oaks Road Elementary
54	250	350	Craven County Schools	James W Smith Elementary
55	260	444	Cumberland County Schools	Teresa C Berrien Elementary
56	260	404	Cumberland County Schools	William H Owen Elementary
57	260	405	Cumberland County Schools	Pauline Jones Elementary
58	260	450	Cumberland County Schools	Warrenwood Elementary
59	260	428	Cumberland County Schools	Spring Lake Middle
60	260	316	Cumberland County Schools	Lillian Black Elementary
61	260	321	Cumberland County Schools	Douglas Byrd Middle
62	260	440	Cumberland County Schools	Sunnyside Elementary
63	260	352	Cumberland County Schools	Cumberland Road Elementary
64	260	456	Cumberland County Schools	Alger B Wilkins Elementary
65	260	402	Cumberland County Schools	Manchester Elementary
66	260	361	Cumberland County Schools	Ferguson-Easley Elementary
67	260	358	Cumberland County Schools	Luther "Nick" Jeralds Middle
68	260	326	Cumberland County Schools	Elizabeth M Cashwell Elem
69	260	371	Cumberland County Schools	Ireland Drive Middle
70	260	382	Cumberland County Schools	Ludie Souders Elementary
71	260	386	Cumberland County Schools	Margaret Willis Elementary
72	260	459	Cumberland County Schools	William T Brown Elementary
73	260	452	Cumberland County Schools	Westarea Elementary
74	260	320	Cumberland County Schools	Brentwood Elementary
75	260	344	Cumberland County Schools	J W Coon Elementary
76	260	410	Cumberland County Schools	Ponderosa Elementary
77	260	396	Cumberland County Schools	Mary McArthur Elementary
78	260	400	Cumberland County Schools	Montclair Elementary
79	291	332	Lexington City Schools	Lexington Middle
80	291	308	Lexington City Schools	Charles England Intermediate
81	291	348	Lexington City Schools	South Lexington/Develop Wing
82	291	352	Lexington City Schools	Southwest Elementary
83	291	340	Lexington City Schools	Pickett Primary
84	292	316	Thomasville City Schools	Liberty Drive Elementary
85	292	320	Thomasville City Schools	Thomasville Middle
86	300	308	Davie County Schools	Cooleemee Elementary
87	310	336	Duplin County Schools	Warsaw Elementary
88	310	384	Duplin County Schools	Rose Hill-Magnolia Elementary
89	310	396	Duplin County Schools	Warsaw Middle
90	310	340	Duplin County Schools	E E Smith Middle
91	310	324	Duplin County Schools	Charity Middle
92	310	304	Duplin County Schools	B F Grady Elementary
93	320	341	Durham Public Schools	Lakeview School
94	320	400	Durham Public Schools	Y E Smith Elementary

#	LEA #	School #	LEA Name	School Name
95	320	344	Durham Public Schools	Fayetteville Street Elementary
96	320	374	Durham Public Schools	C C Spaulding Elementary
97	320	310	Durham Public Schools	Eastway Elementary
98	320	308	Durham Public Schools	Burton Elementary
99	320	314	Durham Public Schools	Chewning Middle
100	320	320	Durham Public Schools	Glenn Elementary
101	320	339	Durham Public Schools	Lakewood Elementary
102	320	363	Durham Public Schools	E K Powe Elementary
103	320	328	Durham Public Schools	Holt Elementary
104	320	304	Durham Public Schools	Bethesda Elementary
105	320	352	Durham Public Schools	Merrick-Moore Elementary
106	320	367	Durham Public Schools	R N Harris Elementary
107	330	332	Edgecombe County Public School	Phillips Middle
108	330	312	Edgecombe County Public School	Coker-Wimberly Elementary
109	330	348	Edgecombe County Public School	West Edgecombe Middle
110	330	354	Edgecombe County Public School	Stocks Elementary
111	330	324	Edgecombe County Public School	C B Martin Middle
112	330	330	Edgecombe County Public School	W A Pattillo A+ Elementary Sch
113	330	304	Edgecombe County Public School	G W Bulluck Elementary
114	330	308	Edgecombe County Public School	G W Carver Elementary
115	340	385	Forsyth County Schools	Griffith Academy
116	340	492	Forsyth County Schools	Philo Middle
117	340	376	Forsyth County Schools	Forest Park Elementary
118	340	351	Forsyth County Schools	Cook Elementary
119	340	424	Forsyth County Schools	Kimberley Park Elementary
120	340	490	Forsyth County Schools	Petree Elementary
121	340	396	Forsyth County Schools	Hill Middle
122	340	447	Forsyth County Schools	Middle Fork Elementary
123	340	368	Forsyth County Schools	Easton Elementary
124	340	452	Forsyth County Schools	Mineral Springs Middle
125	340	462	Forsyth County Schools	North Hills Elementary
126	340	430	Forsyth County Schools	Latham Elementary
127	340	390	Forsyth County Schools	Hall-Woodward Elementary
128	340	476	Forsyth County Schools	Old Town Elementary
129	340	530	Forsyth County Schools	Speas Elementary
130	340	400	Forsyth County Schools	Ibrahim Elementary
131	340	360	Forsyth County Schools	Diggs Elementary
132	340	308	Forsyth County Schools	Ashley Elementary
133	340	448	Forsyth County Schools	Mineral Springs Elementary
134	340	428	Forsyth County Schools	Konnoak Elementary
135	340	314	Forsyth County Schools	Boiton Elementary
136	350	330	Franklin County Schools	Laurel Mill Elementary
137	360	372	Gaston County Schools	Warlick School
138	360	372	Gaston County Schools	Warlick School
139	360	484	Gaston County Schools	Rhyne Elementary
140	360	392	Gaston County Schools	Edward D Sadler, Jr Elementary
141	360	438	Gaston County Schools	Lingerfeldt Elementary
142	360	480	Gaston County Schools	Pleasant Ridge Elementary

#	LEA #	School #	LEA Name	School Name
143	360	520	Gaston County Schools	Woodhill Elementary
144	360	460	Gaston County Schools	Forest Heights Elementary
145	360	526	Gaston County Schools	York Chester Middle
146	360	492	Gaston County Schools	Hershal H Beam Elementary
147	400	332	Greene County Schools	West Greene Elementary
148	410	398	Guilford County Schools	Guilford Newcomers Center
149	410	499	Guilford County Schools	Oak Hill Elementary
150	410	403	Guilford County Schools	W M Hampton Elementary
151	410	598	Guilford County Schools	Wiley Elementary
152	410	439	Guilford County Schools	Kirkman Park Elementary
153	410	328	Guilford County Schools	Bessemer Elementary
154	410	583	Guilford County Schools	Vandalia Elementary
155	410	402	Guilford County Schools	Otis L Hairston Sr Middle
156	410	349	Guilford County Schools	Cesar Cone Elementary
157	410	469	Guilford County Schools	Montlieu Avenue Elementary
158	410	366	Guilford County Schools	Waldo C Falkener Sr Elementary
159	410	511	Guilford County Schools	Parkview Village Elementary
160	410	415	Guilford County Schools	Jackson Middle
161	410	367	Guilford County Schools	Ferndale Middle
162	410	364	Guilford County Schools	Fairview Elementary
163	410	310	Guilford County Schools	Allen Jay Elementary
164	410	532	Guilford County Schools	Rankin Elementary
165	410	385	Guilford County Schools	Gillespie Park Elementary
166	410	373	Guilford County Schools	Jullus I Foust Elementary
167	410	334	Guilford County Schools	Brightwood Elementary
168	410	586	Guilford County Schools	Washington Elementary
169	410	592	Guilford County Schools	Laurin Welborn Middle
170	410	409	Guilford County Schools	Hunter Elementary
171	410	580	Guilford County Schools	Union Hill Elementary
172	410	316	Guilford County Schools	Allen Middle
173	410	322	Guilford County Schools	Archer Elementary
174	410	577	Guilford County Schools	Sumner Elementary
175	410	514	Guilford County Schools	Clara J Peck Elementary
176	410	376	Guilford County Schools	Cyrus P Frazier Elementary
177	410	496	Guilford County Schools	Northwood Elementary
178	410	538	Guilford County Schools	Sedgefield Elementary
179	420	324	Halifax County Schools	Enfield Middle
180	420	312	Halifax County Schools	Brawley Middle
181	420	340	Halifax County Schools	Inborden Elementary
182	420	376	Halifax County Schools	William R Davie Middle
183	420	316	Halifax County Schools	Dawson Elementary
184	420	344	Halifax County Schools	Mdver Elementary
185	420	304	Halifax County Schools	Aurelian Springs Elementary
186	420	348	Halifax County Schools	Pittman Elementary
187	420	328	Halifax County Schools	Everetts Elementary
188	420	308	Halifax County Schools	Bakers Elementary
189	422	318	Weldon City Schools	Weldon Middle
190	422	314	Weldon City Schools	Weldon Elementary

#	LEA #	School #	LEA Name	School Name
191	430	344	Harnett County Schools	Harnett Primary
192	450	343	Henderson County Schools	Balfour Education Center
193	450	306	Henderson County Schools	Bruce Drysdale Elementary
194	460	318	Hertford County Schools	Hertford County Middle
195	460	332	Hertford County Schools	Riverview Elementary
196	460	312	Hertford County Schools	Bearfield Primary
197	470	328	Hoke County Schools	Scurlock Elementary
198	470	336	Hoke County Schools	West Hoke Elementary
199	470	330	Hoke County Schools	South Hoke Elementary
200	470	316	Hoke County Schools	J W McLaughlin Elementary
201	480	306	Hyde County Schools	Mattamuskeet Elementary
202	490	345	Iredell-Statesville Schools	N B Mills Elementary
203	510	388	Johnston County Schools	Selma Elementary
204	510	390	Johnston County Schools	Selma Middle School
205	510	396	Johnston County Schools	West Smithfield Elementary
206	520	336	Jones County Schools	Trenton Elementary
207	520	328	Jones County Schools	Maysville Elementary
208	520	308	Jones County Schools	Comfort Elementary
209	540	306	Lenoir County Public Schools	C H Bynum Elementary
210	540	338	Lenoir County Public Schools	Southeast Elementary
211	540	330	Lenoir County Public Schools	Rochelle Middle
212	540	342	Lenoir County Public Schools	Teachers Memorial Elem
213	540	308	Lenoir County Public Schools	Contentnea Elementary
214	550	312	Lincoln County Schools	Battleground Elementary
215	550	316	Lincoln County Schools	G E Massey Elementary
216	560	332	Macon County Schools	Nantahala School
217	560	316	Macon County Schools	East Frankin Elementary
218	580	316	Martin County Schools	East End Elementary
219	580	350	Martin County Schools	Roanoke Middle
220	580	320	Martin County Schools	Edna Andrews Elementary
221	590	306	McDowell County Schools	Eastfield Elementary
222	600	541	Charlotte-Mecklenburg Schools	Spaugh Middle
223	600	517	Charlotte-Mecklenburg Schools	Reid Park Elementary
224	600	574	Charlotte-Mecklenburg Schools	Walter G Byers Elementary
225	600	489	Charlotte-Mecklenburg Schools	Bruns Avenue Elementary
226	600	553	Charlotte-Mecklenburg Schools	Thomasboro Elementary
227	600	581	Charlotte-Mecklenburg Schools	John T Williams Middle
228	600	311	Charlotte-Mecklenburg Schools	Ashley Park Elementary
229	600	374	Charlotte-Mecklenburg Schools	Druid Hills Elementary
230	600	335	Charlotte-Mecklenburg Schools	Billingsville Elem
231	600	341	Charlotte-Mecklenburg Schools	Cochrane Middle
232	600	585	Charlotte-Mecklenburg Schools	Wilson Middle
233	600	448	Charlotte-Mecklenburg Schools	Martin Luther King, Jr Middle
234	600	577	Charlotte-Mecklenburg Schools	Westerly Hills Elementary
235	600	381	Charlotte-Mecklenburg Schools	Eastway Middle
236	600	329	Charlotte-Mecklenburg Schools	Briarwood Elementary
237	600	308	Charlotte-Mecklenburg Schools	Allenbrook Elementary
238	600	468	Charlotte-Mecklenburg Schools	Nathaniel Alexander Elem

#	LEA #	School #	LEA Name	School Name
239	600	520	Charlotte-Mecklenburg Schools	Sedgefield Middle
240	600	410	Charlotte-Mecklenburg Schools	Hickory Grove Elementary
241	600	301	Charlotte-Mecklenburg Schools	Albemarle Road Middle
242	600	589	Charlotte-Mecklenburg Schools	Winterfield Elementary
243	600	550	Charlotte-Mecklenburg Schools	Sterling Elementary
244	600	300	Charlotte-Mecklenburg Schools	Albemarle Road Elementary
245	600	365	Charlotte-Mecklenburg Schools	Devonshire Elementary
246	600	427	Charlotte-Mecklenburg Schools	Irwin Avenue Open
247	600	393	Charlotte-Mecklenburg Schools	First Ward Elementary
248	600	587	Charlotte-Mecklenburg Schools	Windsor Park Elementary
249	600	474	Charlotte-Mecklenburg Schools	Newell Elementary
250	600	414	Charlotte-Mecklenburg Schools	Highland Renaissance Academy
251	600	412	Charlotte-Mecklenburg Schools	Hidden Valley Elementary
252	600	519	Charlotte-Mecklenburg Schools	Sedgefield Elementary
253	600	495	Charlotte-Mecklenburg Schools	Pawtucket Elementary
254	600	453	Charlotte-Mecklenburg Schools	Merry Oaks Elementary
255	600	459	Charlotte-Mecklenburg Schools	Montclair Elementary
256	600	512	Charlotte-Mecklenburg Schools	Rama Road Elementary
257	600	319	Charlotte-Mecklenburg Schools	Berryhill Elementary
258	600	471	Charlotte-Mecklenburg Schools	Nations Ford Elementary
259	600	441	Charlotte-Mecklenburg Schools	Lincoln Heights Elementary
260	600	450	Charlotte-Mecklenburg Schools	McClintock Middle
261	600	527	Charlotte-Mecklenburg Schools	Shamrock Gardens Elementary
262	600	501	Charlotte-Mecklenburg Schools	Pinewood Elementary
263	620	314	Montgomery County Schools	East Middle
264	620	312	Montgomery County Schools	Candor Elementary
265	620	324	Montgomery County Schools	Mount Gilead Elementary
266	620	334	Montgomery County Schools	Star-Biscoe Elementary
267	630	320	Moore County Schools	Elise Middle
268	630	348	Moore County Schools	Robbins Elementary
269	640	331	Nash-Rocky Mount Schools	James C Braswell Elementary
270	640	354	Nash-Rocky Mount Schools	O R Pope Elementary
271	640	306	Nash-Rocky Mount Schools	Baskerville Elementary
272	640	326	Nash-Rocky Mount Schools	D S Johnson Elementary
273	640	396	Nash-Rocky Mount Schools	Williford Elementary
274	650	354	New Hanover County Schools	Lakeside
275	650	384	New Hanover County Schools	A H Snipes Academy of Arts/Des
276	650	368	New Hanover County Schools	Sunset Park Elementary
277	650	312	New Hanover County Schools	Rachel Freeman Elementary
278	650	360	New Hanover County Schools	Dorothy B Johnson Elementary
279	650	346	New Hanover County Schools	Mary C Williams Elementary
280	660	364	Northampton County Schools	Rich Square WS Creecy Elem
281	660	320	Northampton County Schools	Gaston Middle
282	660	356	Northampton County Schools	Squire Elementary
283	660	316	Northampton County Schools	Garysburg Elementary
284	660	308	Northampton County Schools	Conway Middle
285	660	360	Northampton County Schools	Willis Hare Elementary
286	660	306	Northampton County Schools	Central Elementary

#	LEA #	School #	LEA Name	School Name
287	680	312	Orange County Schools	Central Elementary
288	700	320	Pasquotank County Schools	P W Moore Elementary
289	700	324	Pasquotank County Schools	Sheep-Harney Elementary
290	710	312	Pender County Schools	Burgaw Elementary
291	710	324	Pender County Schools	Malpass Corner Elementary
292	730	356	Person County Schools	South Elementary
293	730	334	Person County Schools	North Elementary
294	740	382	Pitt County Schools	Sadie Saulter Elementary
295	740	402	Pitt County Schools	Wellcome Middle
296	740	375	Pitt County Schools	Northwest Elementary
297	740	376	Pitt County Schools	Pactolus Elementary
298	740	390	Pitt County Schools	South Greenville Elementary
299	740	310	Pitt County Schools	Belvoir Elementary
300	760	340	Randolph County Schools	Ramseur Elementary
301	761	312	Asheboro City Schools	Balfour Elementary
302	761	336	Asheboro City Schools	North Asheboro Middle
303	761	321	Asheboro City Schools	Donna L Loffin Elementary
304	770	304	Richmond County Schools	Ashley Chapel Elementary
305	770	332	Richmond County Schools	Hoffman Elementary
306	770	364	Richmond County Schools	Rohanen Junior High
307	770	344	Richmond County Schools	Mineral Springs Elementary
308	770	366	Richmond County Schools	Rohanen Primary
309	770	328	Richmond County Schools	Hamlet Middle
310	770	368	Richmond County Schools	West Rockingham Elementary
311	780	410	Robeson County Schools	Townsend Middle
312	780	393	Robeson County Schools	Red Springs Middle
313	780	390	Robeson County Schools	R B Dean Elementary
314	780	324	Robeson County Schools	Fairgrove Middle
315	780	326	Robeson County Schools	Fairmont Middle
316	780	344	Robeson County Schools	Magnolia Elementary
317	780	356	Robeson County Schools	Oxendine Elementary
318	780	417	Robeson County Schools	W H Knuckles
319	780	396	Robeson County Schools	Rowland Middle
320	780	394	Robeson County Schools	Rosenwald Elementary
321	780	320	Robeson County Schools	Deep Branch Elementary
322	780	329	Robeson County Schools	Janie C Hargrave Elem
323	780	374	Robeson County Schools	Peterson Elementary
324	780	400	Robeson County Schools	Saint Pauls Elementary
325	780	360	Robeson County Schools	Parkton Elementary
326	780	328	Robeson County Schools	Green Grove Elementary
327	780	392	Robeson County Schools	Rex-Rennert Elementary
328	780	416	Robeson County Schools	Union Elementary
329	780	408	Robeson County Schools	Southside/Ashpole Elem
330	780	412	Robeson County Schools	Union Chapel Elementary
331	780	418	Robeson County Schools	West Lumberton Elementary
332	780	340	Robeson County Schools	Long Branch Elementary
333	780	398	Robeson County Schools	Rowland Norment Elementary
334	780	330	Robeson County Schools	L Gilbert Carroll Middle

#	LEA #	School #	LEA Name	School Name
335	790	358	Rockingham County Schools	Moss Street Elementary
336	790	322	Rockingham County Schools	Draper Elementary
337	790	344	Rockingham County Schools	Leaksville-Spray Elementary
338	790	338	Rockingham County Schools	Lawsonville Ave Elem
339	790	402	Rockingham County Schools	Williamsburg Elementary
340	800	346	Rowan-Salisbury Schools	Elizabeth Duncan Koontz Elemen
341	800	359	Rowan-Salisbury Schools	E Hanford Dole Elementary
342	800	373	Rowan-Salisbury Schools	North Rowan Elementary
343	810	336	Rutherford County Schools	Forest City-Dunbar Elementary
344	810	396	Rutherford County Schools	Spindale Elementary
345	820	370	Sampson County Schools	Union Middle
346	820	312	Sampson County Schools	Charles E Perry Elementary
347	820	384	Sampson County Schools	Union Elementary
348	820	346	Sampson County Schools	Hobbtton Elementary
349	830	336	Scotland County Schools	North Laurinburg Elementary
350	830	347	Scotland County Schools	Shaw Elementary
351	830	320	Scotland County Schools	I E Johnson Elementary
352	830	360	Scotland County Schools	Wagram Primary
353	830	344	Scotland County Schools	Pate Gardner Elementary
354	840	330	Stanly County Schools	North Albemarle Elementary
355	840	316	Stanly County Schools	East Albemarle Elementary
356	840	310	Stanly County Schools	Central Elementary
357	860	320	Surry County Schools	Flat Rock Elementary
358	900	365	Union County Public Schools	South Providence
359	900	306	Union County Public Schools	East Elementary
360	900	351	Union County Public Schools	Rock Rest Elementary
361	900	370	Union County Public Schools	Walter Bickett Elementary
362	900	314	Union County Public Schools	Monroe Middle
363	900	304	Union County Public Schools	Berton Heights Elementary
364	900	332	Union County Public Schools	Marshville Elementary
365	910	312	Vance County Schools	Clark Street Elementary
366	910	320	Vance County Schools	Henderson Middle
367	910	316	Vance County Schools	Eaton-Johnson Middle
368	910	360	Vance County Schools	E M Rollins Elementary
369	910	376	Vance County Schools	L B Yancey Elementary
370	910	356	Vance County Schools	Pinkston Street Elementary
371	910	340	Vance County Schools	New Hope Elementary
372	910	314	Vance County Schools	Dabney Elementary
373	910	308	Vance County Schools	Carver Elementary
374	910	380	Vance County Schools	Zeb Vance Elementary
375	910	346	Vance County Schools	E O Young Jr Elementary
376	920	336	Wake County Schools	Brentwood Elementary
377	920	560	Wake County Schools	Smith Elementary
378	930	344	Warren County Schools	South Warren Elementary
379	930	340	Warren County Schools	Northside Elementary
380	930	330	Warren County Schools	Mariam Boyd Elementary
381	940	328	Washington County Schools	Washington County Union
382	940	314	Washington County Schools	Pines Elementary

#	LEA #	School #	LEA Name	School Name
383	940	306	Washington County Schools	Creswell Elementary
384	960	337	Wayne County Public Schools	Goldsboro Intermediate
385	960	326	Wayne County Public Schools	Dillard Middle
386	960	390	Wayne County Public Schools	North Drive Elementary
387	960	376	Wayne County Public Schools	School Street Elementary
388	960	312	Wayne County Public Schools	Brogden Middle
389	960	348	Wayne County Public Schools	Mount Olive Middle
390	960	314	Wayne County Public Schools	Brogden Primary
391	960	318	Wayne County Public Schools	Carver Heights
392	970	308	Wilkes County Schools	Boomer-Ferguson Elementary
393	970	340	Wilkes County Schools	Moravian Falls Elementary
394	980	357	Wilson County Schools	Vick Elementary
395	980	308	Wilson County Schools	B O Barnes Elementary
396	980	317	Wilson County Schools	Charles H Darden Middle
397	980	356	Wilson County Schools	Margaret Hearne Elementary
398	980	400	Wilson County Schools	Winstead Elementary