

**REPORT OF THE
VIRGINIA BOARD OF EDUCATION**

The High School Graduation Rate Formula

**TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA**



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COMMONWEALTH of VIRGINIA

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December 12, 2006

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The Honorable Timothy M. Kaine
Governor of Virginia
Patrick Henry Building, 3rd Floor
1111 East Broad Street
Richmond, Virginia 23219

Dear Governor Kaine:

Pursuant to Section § 22.1-253 of the *Code of Virginia*, I am pleased to submit the following report: *High School Graduation Rate Formula*, on behalf of the Board of Education.

During 2006, the legislature passed House Bill 19 which amended § 22.1-253 of the *Code of Virginia* relating to the calculation of high school graduation rates. The amendment states that "To ensure the uniform assessment of high school graduation rates, the Board shall collect, analyze, and report high school graduation and dropout data using a formula prescribed by the Board." A second enactment clause requires the Board to report to the House Committee on Education and the Senate Committee on Education and Health the formula approved by the Board and to consider the 2005 Report of the National Governors Association (NGA) Task Force on State High School Graduation data in developing the formula.

This report outlines the Board's review of several graduation rate formulas including the characteristics, strengths, and weaknesses of each formula. The Board found that the NGA On-Time Graduation Rate Formula addressed several weaknesses found in the other rates and decided to adopt that formula.

If you have any questions or require additional information, please contact me at (804) 225-2023.

Sincerely,

A handwritten signature in cursive script that reads "Billy K. Cannaday, Jr.".

Billy K. Cannaday, Jr.

BKCJr/LWN/nhb

cc: The Honorable Robert Tata, Chairman, House Education Committee
The Honorable Russell Potts, Chairman, Senate Education and Health Committee
The Honorable William Frahn, Chief Patron, HB 19

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The High School Graduation Rate Formula

Executive Summary

As Virginia has moved forward with its accountability program there has been increased public interest in accuracy of graduation rates. These rates have long been indicators of school performance, but have been heavily critiqued for their unreliability. Current graduation rate formulas used in Virginia are research estimates of the percentage of students that graduate. They tend to be unreliable when disaggregated to levels below the state and fail to reflect real-life events such as student mobility, declining school populations, and ninth-grade retention. Implementation of the Educational Information Management System (EIMS) (which assigns students with unique state test identifiers that can be used to follow academic progress over time), has provided an opportunity to accurately link freshman records four years later to determine their graduation or completion status.

House Bill 19 (2006) amended section § 22.1-253, 13:4 of the *Code of Virginia* and requires the State Board of Education to assure uniform assessment of high school graduation rates by collecting, analyzing and reporting high school graduation and dropout data using a formula prescribed by the Board. The Board's Committee on Graduation and Dropouts studied seven widely-discussed graduation rate formulas and evaluated the strengths and weakness of each. These characteristics included:

- recognition of the five Virginia diplomas
- recognition of retention practices
- allowing for students who take longer than four years to graduate
- consideration of student mobility and declining student populations, and
- accuracy of the rate when disaggregated to the division, school, and subgroup level.

The formulas studied are listed below:

- The NGA "on-time" Graduation Rate
- The Virginia No Child Left Behind (NCLB) Graduation Rate
- The Virginia Unadjusted Graduation Rate
- The National Center for Education Statistics (NCES) Averaged Freshman Graduation Rate
- The Warren Estimated Completion Rate
- The Green Adjusted Completion Rate
- The Urban Institute Cumulative Promotion Index

Of the seven rates studied, six were estimates, and one, the NGA rate, was an actual measure based on individual student progress over time.

The NGA formula addresses several weaknesses found in the six estimated rates. It recognizes the five Virginia diplomas. Advanced, Standard, Modified Standard, Special, and General Achievement diplomas are included. General Educational Development (GED) diplomas and certificates of program completion are not included. It excludes students who have been retained in the ninth grade; allows Special Education students and students with Limited English proficiency more time to graduate; does not penalize schools with declining enrollments; and takes student mobility into consideration by accounting for students that transfer in and out of schools, the division, and the state.

The Committee on Graduation and Dropouts recommended and the full Board of Education adopted the NGA On-Time Graduation Rate formula.

The NGA On-Time Graduation Rate formula $\{OGy / [(My-4,fg9) + (TI) - (TO)]\}$ is calculated by dividing the number of on-time graduates in a given year (OGy) by the number of first-time entering ninth graders four years earlier (My-4,fg9) plus the number of transfers in (TI) minus the number of transfers out (TO).

In the fall of 2008, the records of first time freshmen (the first group of students assigned state testing identifiers) in 2004-2005 can be linked to their records four years later to determine their graduation or completion status. Therefore, the NGA On-Time High School Graduation rate will be reported by Virginia for the first time in the fall of 2008 for students who entered the ninth grade four years earlier.

Background

House Bill 19 (2006) amended § [22.1-253.13:4](#) of the *Code of Virginia* relating to calculation of high school graduation rates. The amendment states that “To ensure the uniform assessment of high school graduation rates, the Board shall collect, analyze, and report high school graduation and dropout data using a formula prescribed by the Board.” A second enactment clause requires the Board to report to the House Committee on Education and the Senate Committee on Education and Health by December 1, 2006, on the formula. The second enactment clause also requires the Board to consider the 2005 Report of the National Governors Association (NGA) Task Force on State High School Graduation Data in developing the formula (the NGA report may be found on the Internet at www.nga.org/Files/pdf/0507GRAD.pdf). A copy of HB 19 is attached.

Graduation Counts, the report of the NGA Task Force, contains five recommendations that address improving the quality of graduation and dropout data.

- Immediately adopt, and begin taking steps to implement, a standard four-year, adjusted cohort graduation rate using the following formula:

$$\text{graduation rate} = [\text{on-time graduates in year } x] / [(\text{first-time entering ninth graders in year } x-4) + (\text{transfers in}) - (\text{transfers out})].$$
- Build the state’s data system and capacity to ensure that the system can collect, analyze, and report the adopted indicators and other important information.
- Adopt additional, complementary indicators to provide richer context and understanding about outcomes for students and how well the system is serving them.
- Develop public understanding about the need for good graduation and dropout rate data.
- Collaborate with local education leaders, higher education leaders, business leaders, and leaders of local community organizations.

The NGA report defines the recommended graduation rate as

“... a measure of on-time completion, with most students, but not all, expected to finish in four years.”

All 50 state governors then signed a compact, agreeing to

“...calculate the graduation rate by dividing the number of on-time graduates in a given year by the number of first-time entering ninth graders four years earlier. Graduates are those receiving a high school diploma. The denominator can be adjusted for transfers in and out of the system and data systems will ideally track individual students with a longitudinal student unit record data system. Special education students and recent immigrants with limited English proficiency can be assigned to different cohorts to allow them more time to graduate.”

Graduation rates have long been used as indicators of school performance, while being heavily critiqued for their unreliability. Current graduation rate formulas are research estimates of the percent of students that graduate. They tend to be unreliable when disaggregated to levels below the state and fail to reflect real-life events such as student mobility, declining school populations, and ninth-grade retention.

The Virginia Board of Education is committed to adopting a graduation rate formula that may be used to uniformly assess high school graduation rates at the state, division, and school levels. Further, the formula must be an actual reflection of student progress, not an estimate. The formula must take into consideration issues such as student mobility, declining student enrollment, instructional practices such as ninth-grade retention, and student achievement that may take longer than the standard four years of high school. Finally, the formula must reflect student attainment of the five diplomas recognized by the Board of Education: the Standard Diploma, the Advanced Studies Diploma, the Modified Standard Diploma, the Special Diploma, and the General Achievement Diploma.

Board Committee Review of Graduation Rate Calculations

The Virginia Board of Education's Committee on Graduation and Dropouts studied seven widely discussed graduation rate formulas, evaluating the strengths and weaknesses of each. These characteristics included:

- Recognition of the five Virginia diplomas;
- Recognition of retention practices;
- Allowing for students that take longer than four years to graduate;
- Consideration of student mobility and declining student populations; and
- Accuracy of the rate when disaggregated to the division, school, and subgroup level.

The five Virginia diplomas are: Standard, Advanced, Modified Standard, Special, and General Achievement. The U.S. Department of Education required the NCLB calculation to include only the Standard and Advanced Diplomas in the numerator; the numerator of some estimates contains all students that received diplomas and students that received certificates of program completion, as defined by 8 VAC 20-131-50 of the *Regulations Establishing Standards for Accrediting Public Schools in Virginia*.

More students are retained in the ninth grade than any other, making this the largest grade and creating what is referred to as the "ninth grade bulge." Some estimates use membership in the ninth grade four years earlier in the graduation rate denominator; using this number can artificially lower the estimate.

Students with approved individual education plans (IEPs) and limited English proficiency may take longer than four years to graduate. Formulas should account for this by assigning students with IEPs or limited English proficiency to a different cohort.

Some graduation rate estimates do not take into account students that move from school to school, in- and out-of-state, and schools with declining enrollment. As a result, the denominator of the rate (counts of students four years earlier when the population was larger/smaller), is artificially high or low, resulting in an unreliable estimate. Because of this, the estimates are less and less reliable as they are disaggregated, or broken down, to the division, school, and group levels.

The seven graduation rate formulas studied by the Board committee are depicted in the table below.

<i>Rate</i>							
<i>Characteristic</i>	<i>NGA On-Time</i>	<i>Virginia NCLB</i>	<i>Virginia Unadjusted</i>	<i>NCES Averaged Freshmen</i>	<i>Warren Estimated Completion Rate</i>	<i>Green Adjusted Completion Rate</i>	<i>Urban Institute Cumulative Promotion Index</i>
Graduation count: calculation counts actual high school students entering and exiting high school Estimate: provides an estimate based on incomplete data	Graduation count	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Calculation is based on a cohort of four-year graduates	✓		✓	✓	✓	✓	✓
Calculation accounts for students transferring in and out of schools	✓	✓			✓	✓	
Students retained in 9 th grade do not over-influence graduation rate"	✓	✓		✓	✓	✓	
Calculated rate reflects students that receive the 5 Virginia diplomas defined by the Virginia Board of Education	✓		✓	✓		✓	✓

✓ indicates this characteristic is a strength of the formula

The formulas that are used to calculate each rate are included on the last page of this report.

Of the seven rates studied, six were estimates, and one, the NGA rate, was an actual measure based on individual student progress over time. The Board of Education has adopted the NGA On-Time Graduation Rate formula.

The NGA On-Time High School Graduation Rate Formula

In this formula, graduates (recipients of Advanced, Standard, Modified Standard, Special, and General Achievement Diplomas) in a given year are divided by the number of first time ninth-grade students four years earlier, plus students transferring in, minus students transferring out. Adjustments may be made to the formula to account for students with disabilities and limited English proficient students to allow them more time to graduate. The formula is based on individual student records collected over a period of years, making it an actual, rather than an estimated, rate of completion.

The NGA formula addresses several weaknesses found in the six estimated rates. It recognizes the five Virginia diplomas. It excludes students that have been retained in the ninth grade; does not penalize schools with declining enrollments; and takes student mobility into consideration by accounting for students that transfer in and out of schools, the division, and the state.

Implementation of the High School Graduation Rate Formula

Virginia is implementing a longitudinal student information system that collects individual student records at multiple times throughout the school year. Data collected on the student record that relate to the graduation rate formula are listed below.

- State Testing Identifier (unique number assigned to each student)
- Division, school, current grade
- Age, gender, race/ethnicity, and other demographics
- Promotion/retention status
- Reason for leaving school:
 - Graduated with a diploma or completed with a certificate
 - Dropped out or aged out
 - Transferred (out of school, division, state)
 - Extended absence due to illness, suspension, incarceration
 - Died
- Diploma or other credential received (completers only)

Beginning with the 2004-2005 school year, student records were assigned a unique identifier that stays with each student's record throughout their K-12 public education career. In the fall of 2008, the records of first time freshmen in 2004-2005 can be linked to their records four years later to determine their graduation or completion status. Thus,

the NGA On-Time High School Graduation rate will be reported by Virginia for the first time in the fall of 2008 for students who entered the ninth grade four years earlier.

The Virginia Board of Education's Graduation Rate Formula

The Board of Education has adopted the NGA On-Time Graduation Rate formula:

$$\text{graduation rate} = \frac{\text{[on-time graduates in year x]}}{\text{[(first-time entering ninth graders in year x-4) + (transfers in) - (transfers out)]}}$$

The Virginia implementation of the formula defines graduates as students who earn Advanced, Standard, Modified Standard, Special, and General Achievement Diplomas within four years of the first time they entered the ninth grade. Special Education students and students with Limited English proficiency who have plans in place to allow them more time to graduate will be assigned to different cohorts. Deceased students will be counted among transfers out in the denominator, while incarcerated students will be counted as transfers as they leave and re-enter the system.

Formulas for the seven graduation rates studied by the Board Committee on Graduation and Dropouts

Rate	Formula
NGA On-time	$\frac{OGy}{[(My-4,fg9) + (TI) - (TO)]}$
Virginia NCLB	$\frac{Gy}{(Oy + Gy + Dy,g12 + Dy1,g11 + Dy2,g10 + Dy3,g9)}$
Virginia Unadjusted	$\frac{Gy}{My-4,g9}$
NCES Averaged Freshmen	$\frac{Gy}{(My-5,g8 + My-4,g9 + My-3,g10)/3}$
Warren ECR	$\frac{Cy}{g8y-5 * MA}$
Greene ACR (2001)	$\frac{Dy}{((My-5,g8 + My-4,g9 + My-3,g10)/3) * MA}$
Urban Institute Cumulative Promotion	$(g10y/g9y-1)*(g11y/g10y-1)*(g12y/g11y-1)*(Gy-1/g12y-1)$

OG – On-time Graduates

M – Membership

TI – Transfers In

TO – Transfers Out

O – Other Completers

D – Dropouts

G – Graduates

C – Completers

g – Grade

y – School year

MA – Migration Adjustment:

$$1 + ((g9y+g10y+g11y+g12y) - (g9y-4+g10y-4+g11y-4+g12y-4))$$

$$\frac{(g9y-4+g10y-4+g11y-4+g12y-4)}{1 + ((g9y+g10y+g11y+g12y) - (g9y-4+g10y-4+g11y-4+g12y-4))}$$

CHAPTER 584

An Act to amend and reenact § [22.1-253.13:4](#) of the Code of Virginia, relating to calculation of high school graduation rates.

[H 19]

Approved April 5, 2006

Be it enacted by the General Assembly of Virginia:

1. That § [22.1-253.13:4](#) of the Code of Virginia is amended and reenacted as follows:

§ [22.1-253.13:4](#). Standard 4. Student achievement and graduation requirements.

A. Each local school board shall award diplomas to all secondary school students, including students who transfer from nonpublic schools or from home instruction, who earn the units of credit prescribed by the Board of Education, pass the prescribed tests, and meet such other requirements as may be prescribed by the local school board and approved by the Board of Education. Provisions shall be made for students who transfer between secondary schools and from nonpublic schools or from home instruction as outlined in the standards for accreditation. Further, reasonable accommodation to meet the requirements for diplomas shall be provided for otherwise qualified students with disabilities as needed.

In addition, each local school board may devise, vis-à-vis the award of diplomas to secondary school students, a mechanism for calculating class rankings that takes into consideration whether the student has taken a required class more than one time and has had any prior earned grade for such required class expunged.

Each local school board shall notify the parent of rising eleventh and twelfth grade students of (i) the number of standard and verified units of credit required for graduation pursuant to the standards of accreditation and (ii) the remaining number of such units of credit the individual student requires for graduation.

B. Students identified as disabled who complete the requirements of their individualized education programs shall be awarded special diplomas by local school boards.

Each local school board shall notify the parent of such students with disabilities who have an individualized education program and who fail to meet the requirements for graduation of the student's right to a free and appropriate education to age 21, inclusive, pursuant to Article 2 (§ [22.1-213](#) et seq.) of Chapter 13 of this title.

C. Students who have completed a prescribed course of study as defined by the local school board shall be awarded certificates of program completion by local school boards if they are not eligible to receive a standard, advanced studies, modified standard, or general achievement diploma.

Each local school board shall provide notification of the right to a free public education for students who have not reached 20 years of age on or before August 1 of the school year, pursuant to Chapter 1 (§ [22.1-1](#) et seq.) of this title, to the parent of students who

fail to graduate or who have failed to achieve the number of verified units of credit required for graduation as provided in the standards of accreditation. If such student who does not graduate or achieve such verified units of credit is a student for whom English is a second language, the local school board shall notify the parent of the student's opportunity for a free public education in accordance with § [22.1-5](#).

D. In establishing course and credit requirements for a high school diploma, the Board shall:

1. Provide for the selection of integrated learning courses meeting the Standards of Learning and approved by the Board to satisfy graduation credit requirements, which shall include Standards of Learning testing, as necessary;
2. Establish the requirements for a standard, modified standard, or advanced studies high school diploma, which shall include one credit in fine, performing, or practical arts and one credit in United States and Virginia history. The requirements for a standard high school diploma shall, however, include at least two sequential electives chosen from a concentration of courses selected from a variety of options that may be planned to ensure the completion of a focused sequence of elective courses. Students may take such focused sequence of elective courses in consecutive years or any two years of high school. Such focused sequence of elective courses shall provide a foundation for further education or training or preparation for employment and shall be developed by the school division, consistent with Board of Education guidelines and as approved by the local school board;
3. Provide, in the requirements for the verified units of credit stipulated for obtaining the standard or advanced studies diploma, that students completing elective classes into which the Standards of Learning for any required course have been integrated may take the relevant Standards of Learning test for the relevant required course and receive, upon achieving a satisfactory score on the specific Standards of Learning assessment, a verified unit of credit for such elective class that shall be deemed to satisfy the Board's requirement for verified credit for the required course;
4. Establish a procedure to facilitate the acceleration of students that allows qualified students, with the recommendation of the division superintendent, without completing the 140-hour class, to obtain credit for such class upon demonstration of mastery of the course content and objectives. Having received credit for the course, the student shall be permitted to sit for the relevant Standards of Learning assessment and, upon receiving a passing score, shall earn a verified credit. Nothing in this section shall preclude relevant school division personnel from enforcing compulsory attendance in public schools; and
5. Provide for the award of verified units of credit for passing scores on industry certifications, state licensure examinations, and national occupational competency assessments approved by the Board of Education.

School boards shall report annually to the Board of Education the number of industry certifications obtained and state licensure examinations passed, and the number shall be reported as a category on the School Performance Report Card.

In addition, the Board may:

- a. For the purpose of awarding verified units of credit, approve the use of additional or substitute tests for the correlated Standards of Learning assessment, such as academic achievement tests, industry certifications or state licensure examinations; and
- b. Permit students completing career and technical education programs designed to enable such students to pass such industry certification examinations or state licensure examinations to be awarded, upon obtaining satisfactory scores on such industry certification or licensure examinations, the appropriate verified units of credit for one or more career and technical education classes into which relevant Standards of Learning for various classes taught at the same level have been integrated. Such industry certification and state licensure examinations may cover relevant Standards of Learning for various required classes and may, at the discretion of the Board, address some Standards of Learning for several required classes.

E. In the exercise of its authority to recognize exemplary academic performance by providing for diploma seals, the Board of Education shall develop criteria for recognizing exemplary performance in career and technical education programs by students who have completed the requirements for a standard or advanced studies diploma and shall award seals on the diplomas of students meeting such criteria.

In addition, the Board shall establish criteria for awarding a diploma seal for advanced mathematics and technology for the standard and advanced studies diplomas. The Board shall consider including criteria for (i) technology courses; (ii) technical writing, reading, and oral communication skills; (iii) technology-related practical arts training; and (iv) industry, professional, and trade association national certifications.

The Board shall also establish criteria for awarding a diploma seal for excellence in civics education and understanding of our state and federal constitutions and the democratic model of government for the standard and advanced studies diplomas. The Board shall consider including criteria for (i) successful completion of history, government, and civics courses, including courses that incorporate character education; (ii) voluntary participation in community service or extracurricular activities; and (iii) related requirements as it deems appropriate.

F. The Board shall establish, by regulation, requirements for the award of a general achievement diploma for those persons who have (i) achieved a passing score on the GED examination; (ii) successfully completed an education and training program designated by the Board of Education; and (iii) satisfied other requirements as may be established by the Board for the award of such diploma.

G. To ensure the uniform assessment of high school graduation rates, the Board shall collect, analyze, and report high school graduation and dropout data using a formula prescribed by the Board.

The Board may promulgate such regulations as may be necessary and appropriate for the collection, analysis, and reporting of such data.

2. That the Board of Education shall report to the House Committee on Education and the Senate Committee on Education and Health by December 1, 2006, on the formula to

be used for the uniform assessment of high school graduation rates. In developing the formula, the Board of Education shall consider the 2005 Report of the National Governors Association Task Force on State High School Graduation Data.

3. That the provisions of the first enactment clause of this act shall take effect October 1, 2008.