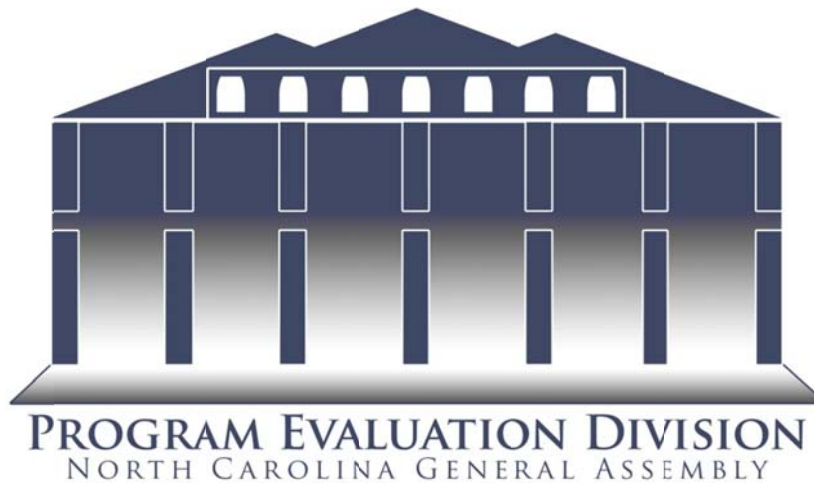


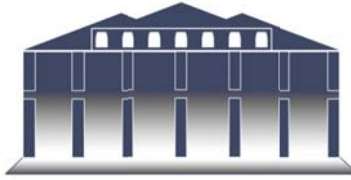
**UNC Enrollment Change Funding Formula
Needs Documentation and
a Performance Component**



**Final Report to the Joint Legislative
Program Evaluation Oversight Committee**

Report Number 2010-05

November 17, 2010



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John W. Turcotte
Director

November 17, 2010

Senator Daniel G. Clodfelter, Co-Chair, Joint Legislative Program Evaluation Oversight Committee
Senator Fletcher L. Hartsell, Jr., Co-Chair, Joint Legislative Program Evaluation Oversight Committee
Representative Nelson Cole, Co-Chair, Joint Legislative Program Evaluation Oversight Committee
Representative James W. Crawford, Jr., Co-Chair, Joint Legislative Program Evaluation Oversight Committee

North Carolina General Assembly
Legislative Building
16 West Jones Street
Raleigh, NC 27601

Honorable Co-Chairs:

Session Law 2008-107, Section 9.10(b) instructed the Program Evaluation Division to complete a comprehensive review of the enrollment growth funding formulas used by The University of North Carolina. This report examined the elements of the formula and evaluated its success in accurately funding enrollment growth.

The University of North Carolina General Administration cooperated with us and was courteous to our evaluators during the evaluation.

Sincerely,

A handwritten signature in black ink, appearing to read "John W. Turcotte".

John W. Turcotte
Director



PROGRAM EVALUATION DIVISION

NORTH CAROLINA GENERAL ASSEMBLY

November 2010

Report No. 2010-05

UNC Enrollment Change Funding Formula Needs Documentation and a Performance Component

Summary

Although the enrollment change funding model is widely accepted by University of North Carolina (UNC) system officials as a valid means to fund one of the system's primary goals—to increase access to higher education—questions about the formula's accuracy have been raised following requests from university officials for adjustments to enrollment change funding. The General Assembly directed the Program Evaluation Division to review the student credit hour enrollment change funding formula to examine its accuracy and consider possible alternatives.

Evaluation findings indicated the student credit hour enrollment change funding formula is complex, relies on inaccurate enrollment growth estimates from campuses, and, as a result, yields inaccurate funding requests. The formula is more complicated than its precursor, the full-time equivalency formula, and this greater detail is intended to provide greater funding equity across campuses. However, this evaluation found the implementation of the student credit hour enrollment change formula is deficient and the increased detail increases enrollment projection errors. Methods used to derive campus-level enrollment projections are not standardized or documented, and funds generated by the formula cannot be tracked.

The formula has generated \$386 million for enrollment growth from State Fiscal Year 2003-04 to 2007-08 but the emphasis on funding growth is not balanced by funding for performance. Although UNC officials have considered increasing accountability and introducing performance funding since 1996, such funding has yet to be implemented.

Four recommendations are based on evaluation findings. First, the General Assembly should require UNC system administrators to thoroughly examine and modify the enrollment change funding formula, standardize the enrollment change projection process, and hold officials accountable to the Board of Governors for sizeable projection errors. Second, the UNC system should develop policy and guidelines for enrollment growth funding decisions. Third, annual campus-level reporting should be provided to the General Assembly using indicators that will hold the system accountable to the public. Finally, the General Assembly should require the UNC system to move forward with implementing performance-based funding that is tied to enrollment growth in order to balance the emphasis on growth with performance in terms of, for example, graduation and retention.

Purpose and Scope

The General Assembly directed the Program Evaluation Division to conduct a comprehensive review of enrollment change funding formulas used by The University of North Carolina (UNC).¹ The UNC system uses the student credit hour enrollment change funding formula to calculate how much money will be needed to fund enrollment increases at 15 of its 17 campuses. In recent years, legislators have questioned the accuracy of this formula because UNC officials have requested funding adjustments to support increases in enrollment in the second year of the biennium. These concerns led the General Assembly to call for the development of an alternative funding formula. In 2005, the General Assembly directed the UNC system, Office of State Budget and Management, and Fiscal Research Division to conduct a comprehensive review of the formula and to develop an alternative approach for the 2007-08 budget process. However, the group did not agree on a new approach. The Office of State Budget and Management proposed changing some factors in the formula, but their recommendations were not acted upon by the General Assembly.

This evaluation addressed three central research questions:

- Does the existing student credit hour enrollment change funding formula provide accurate and reliable projections of likely future growth at UNC campuses and the amounts needed to fund these increases?
- What changes, if any, would improve the accuracy, reliability, and transparency of the existing formula?
- What approaches used in other states might be useful in considering whether to change the existing approach?

To conduct this review, the Program Evaluation Division analyzed information from numerous sources including

- administrative queries completed by each campus;
- interviews and queries with UNC system administrators;
- Board of Governors appropriations requests for the UNC system, 2003-04 through 2009-10;
- budgeted and actual student credit hour enrollment for each campus, 2003-04 through 2008-09;
- budgeted and actual full-time equivalent enrollment for each campus, 2003-04 through 2008-09;
- fall headcount enrollment for each campus, 2003 through 2009;
- certified budgets and year-to-date actual expenditures for 2003-04 through 2008-09;
- literature review of national and other state funding information from higher education organizations; and
- interviews with experts in the field of higher education funding.

¹ 2008 NC Sess. Law, 2008-107. The General Assembly uses two formulas to fund enrollment change in the UNC system: one based on projected changes in student credit hours and the other based on projected changes in full-time equivalency (FTE). This review focuses on the student credit hour formula, which is used by nearly all UNC schools and programs. Appendix A provides information about the FTE formula, which is used by two specialized campuses (North Carolina School for Science and Mathematics and UNC School of the Arts) and seven specific professional schools at four UNC institutions.

The Program Evaluation Division received cooperation from UNC General Administration in conducting this review. However, data requests were not fulfilled in a timely manner, and UNC officials had difficulty locating existing documents. Also, on several occasions, UNC General Administration had to create policy documents in response to requests for historical documentation of the formula's components. These delays lengthened the time needed to complete this review, but the information that was eventually provided was accurate and complete.

Background

Access to higher education is a central goal of the University of North Carolina (UNC) system, and UNC officials regard growth as an important part of ensuring access. Ensuring affordability and access to higher education for all who qualify is the first strategic direction in the system's 2004-2009 long-range plan.² In addition, increased access, particularly for underserved North Carolinians, is the second recommendation—after ensuring high-quality institutions—in the report by the UNC Tomorrow Commission.³ A UNC system official explained that when General Administration works with campuses to develop growth projections, they are guided by the idea that UNC is about access, and this access must be funded.

The UNC system has used funding formulas to justify funding for enrollment growth for over 30 years. The UNC system's first funding model was created in 1978 and used full-time equivalency (FTE) as the basis to calculate and determine funding to support enrollment change (See Appendix A). In 1995, the General Assembly directed the UNC Board of Governors to consider alternative approaches to funding undergraduate and graduate enrollment. Following recommendations from a three-phase study by MGT of America, a consulting firm with expertise in higher education funding, the Board of Governors adopted the semester credit hour⁴ enrollment change funding model in 1998, which was used as the basis for appropriations to support enrollment change in regular-term instruction by the General Assembly for State Fiscal Year 1998-99 (See Appendix B). In the following biennium (1999-01), the request for funding distance education credits was based on the same formula.

Higher education funding formulas are widely used across the country. According to a 2006 survey, 38 states were using funding formulas to determine some or all funding for higher education. North Carolina is among 26 states that use enrollment-based funding formulas. Other methods include

- benchmarks or peer institutions – uses a per student cost for allocations, often based on peer institutions (used in 14 states),

² The University of North Carolina Board of Governors. (2004). *Long-Range Plan, 2004-2009*. Retrieved from <http://www.northcarolina.edu/>.

³ The Commission conducted a study designed to help UNC anticipate and respond to the challenges of the 21st century. See UNC Tomorrow Commission. (December 2007). *Final Report*. Retrieved from www.northcarolina.edu/nctomorrow.

⁴ The term "semester credit hours" is the same as student credit hours.

- performance funding or metrics – metrics of performance are used as a basis to allocate funds (11 states), and
- base plus or minus incremental changes – begins with the previous year's allocation and makes changes, often line-item in nature, based on expected changes (16 states).⁵

North Carolina uses several methods to determine higher education funding, including incremental changes to the base and an enrollment-based funding formula to generate funding requests for enrollment change. Enrollment change funding is added to base funding in subsequent years.

Funding formulas can provide stability and predictability, but the quality of results depends heavily on the accuracy and reliability of the data used. The primary goal of higher education funding formulas is to provide an equitable distribution of available resources. Compared with other strategies for determining funding, formulas are viewed as more objective than other methods because they are developed from data-based projections. For the formula to be reliable, however, the accuracy of the growth projections entered into the model is crucial. Regardless of the rationale supporting the model, if projected enrollment growth is based on unreliable data or assumptions, then funding will not align with actual enrollment growth. In addition, formulas do not take into account program quality, may reinforce preexisting inequalities among institutions, and may not adequately account for changes in the needs of incoming students or for sudden changes in enrollment or costs.

The student credit hour (SCH) enrollment change funding formula is the primary mechanism for determining the appropriations request to support enrollment change for the UNC system. The formula is designed to indicate the amount of funding needed to support instruction, libraries, and general institutional support (i.e., academic support, student services, institutional support, and physical plant) for projected enrollment growth. The SCH funding formula is used at 15 UNC campuses:

- Appalachian State University;
- East Carolina University (except for the school of medicine);
- Elizabeth City State University;
- Fayetteville State University;
- North Carolina A&T State University;
- North Carolina Central University (except for the school of law);
- North Carolina State University (except for the college of veterinary medicine);
- UNC Asheville;
- UNC Chapel Hill (except for schools of dentistry, law, medicine, and pharmacy);
- UNC Charlotte;
- UNC Greensboro;
- UNC Pembroke;
- UNC Wilmington;

⁵ McKeown-Moak, Mary P. MGT of America, Inc. (August 2006). Survey Results: 2006 Survey of Funding Formula Use.

- Western Carolina University; and
- Winston-Salem State University.

The SCH funding formula is more complex than an FTE approach because it takes program costs and degree-level differences into account. As the name suggests, the SCH funding formula is based on student credit hours rather than on headcount or enrollment status. Because smaller class sizes and specialized instruction in certain disciplines result in higher instructional costs, the SCH funding formula treats credit hours generated by discipline and instructional levels differently (e.g., undergraduate history courses are less expensive to teach than doctoral level engineering courses). This approach has a greater degree of “granularity”—that is, it is composed of many individual elements. In general, approaches with greater granularity have the potential to account for more of the characteristics of courses that affect cost, and presumably, result in more accurate funding.

The UNC system divides and differentiates credit hours in the following way. Each instructional discipline is assigned to one of four instructional categories based on similar instructional costs. Disciplines such as history, communications, and psychology are grouped in the lowest cost category (Category I), whereas engineering and nursing are classified in the most expensive cost category (Category IV). Similarly, instructional costs differ by level (i.e., undergraduate, master’s, and doctoral). The combination of the four instructional categories and three degree levels creates a 12-cell matrix of student credit hours that drives the enrollment change funding request.

Generating estimates through the SCH funding formula involves multiple steps. Exhibit 1 presents an overview of the process.⁶ As shown, the first step occurs before the formula is applied: individual campuses develop enrollment projections in conjunction with UNC General Administration. Campuses are responsible for developing projections for each cell of the matrix and estimating tuition revenue from enrollment change. UNC General Administration reviews the proposed enrollment change projections, makes adjustments as needed, and works with campuses to determine appropriate growth for the funding request. (This iterative process is discussed in more detail later in this report.) The agreed-upon total SCH projections for each campus in each of the 12 cells are compared to the prior year’s total SCH projection, then the resulting enrollment change increment is entered into the formula. Funding is calculated separately for regular term and distance education.

The formula itself involves several steps:

- **Determining the number of positions.** The formula uses national cost data⁷ to determine the number of SCH per instructional position needed to accommodate enrollment change. Campuses that serve special undergraduate populations receive an additional

⁶ For a more detailed explanation of the SCH funding formula, see Appendix B.

⁷ University of Delaware. (2002-03 and 2003-04 Academic Years). *National Study of Instructional Costs and Productivity by Academic Discipline*.

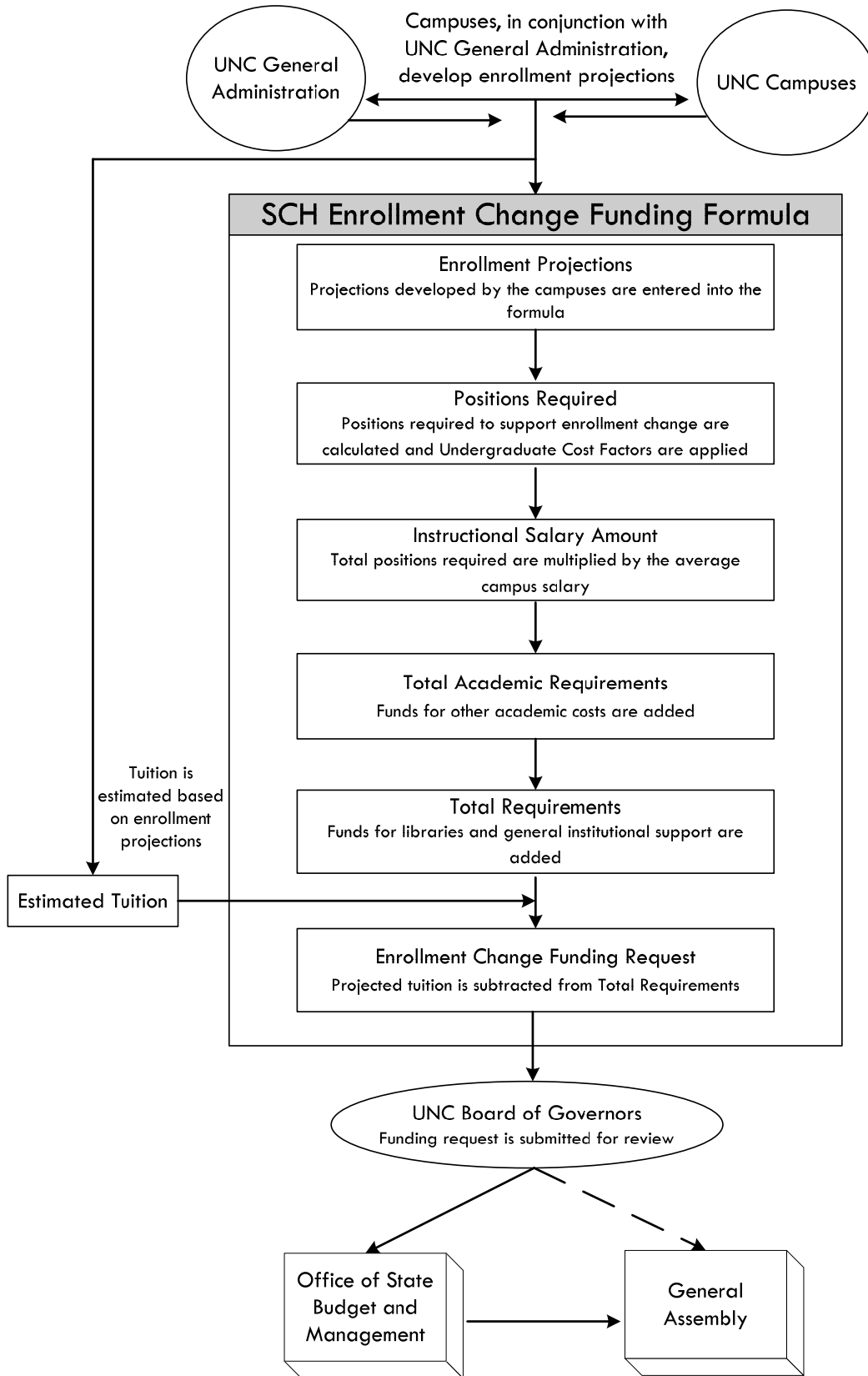
percentage of the number of undergraduate faculty positions needed, referred to as undergraduate cost factors.⁸

- **Determining instructional salary costs.** The total faculty positions generated from the 12-cell matrix and undergraduate cost factors are multiplied by the average faculty salary⁹ for each campus to derive the instructional salary amount.
- **Adding funding for other academic requirements.** Beyond faculty salary, other academic costs are involved in accommodating enrollment growth. These include items such as fringe benefits, support staff, and related instructional costs. To account for these costs, the formula multiplies the instructional salary amount by a fixed percentage (44.89%) and adds the resulting amount to the instructional salary amount to calculate total academic requirements.
- **Adding funding for other enrollment-related cost requirements.** To determine additional funding needed for institutional support related to instruction, total academic requirements are multiplied by fixed percentages for library (11.48%) and general institutional support (54.05%). Added to the total academic requirements, these additional amounts constitute the total requirements needed by each campus to support enrollment change.
- **Applying the tuition offset to generate the enrollment change funding request.** The estimated tuition revenue is subtracted from total requirements to determine the budget appropriation request from the General Assembly. Campuses calculate the expected tuition revenue based on the projected enrollment change for in-state and out-of-state undergraduate and graduate students.

⁸ In 2008-09, the additional percentages ranged from 10% to 25%. Undergraduate cost factors only applied to undergraduate positions generated by the formula. The factors are not considered for distance education enrollment change.

⁹ In 2008-09, average faculty salary ranged from \$64,086 at Fayetteville State University to \$100,740 at UNC Chapel Hill.

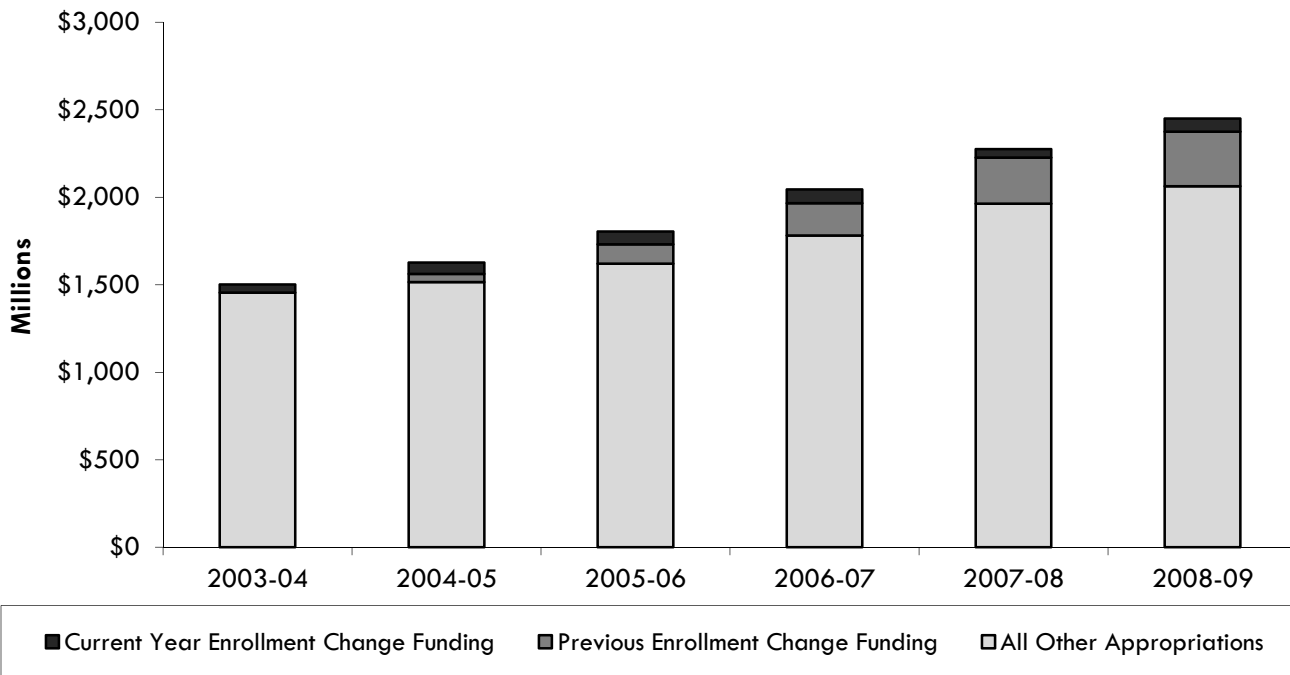
Exhibit 1: Flow Chart of the Student Credit Hour Enrollment Change Funding Model



Source: Program Evaluation Division based on the SCH Enrollment Change Funding Model provided by UNC General Administration.

Enrollment change funding is an important component of UNC system funding because it is added to each campus’s base funding for the following year. The majority of the UNC system’s funding is determined through the base budget request, which is derived largely by adjusting the prior year’s funding to address inflation, personnel cost adjustments, and other factors. Annual enrollment change funding totaled \$386 million between 2003-04 and 2008-09, which represented 2 to 4% of the total appropriations each year. Over time, however, enrollment change funding has a much greater effect because each year the approved amount becomes part of the funding base—and therefore part of the base budget for the following year. As Exhibit 2 shows, when this cumulative effect is taken into account, total enrollment change funding from 2003-04 through 2008-09 represents about 16% of the UNC system’s 2008-09 budget. Thus, enrollment change funding is not trivial because it contributes to the increased amount of funding appropriated to the UNC system every year.

Exhibit 2: Enrollment Change Funding as a Proportion of Total UNC Appropriations and Cumulative Effect for Fiscal Years 2003-04 to 2008-09



Note: Management flexibility reductions may not be reflected in the proportion of previous enrollment funding.

Source: Program Evaluation Division based on appropriations data provided by UNC General Administration.

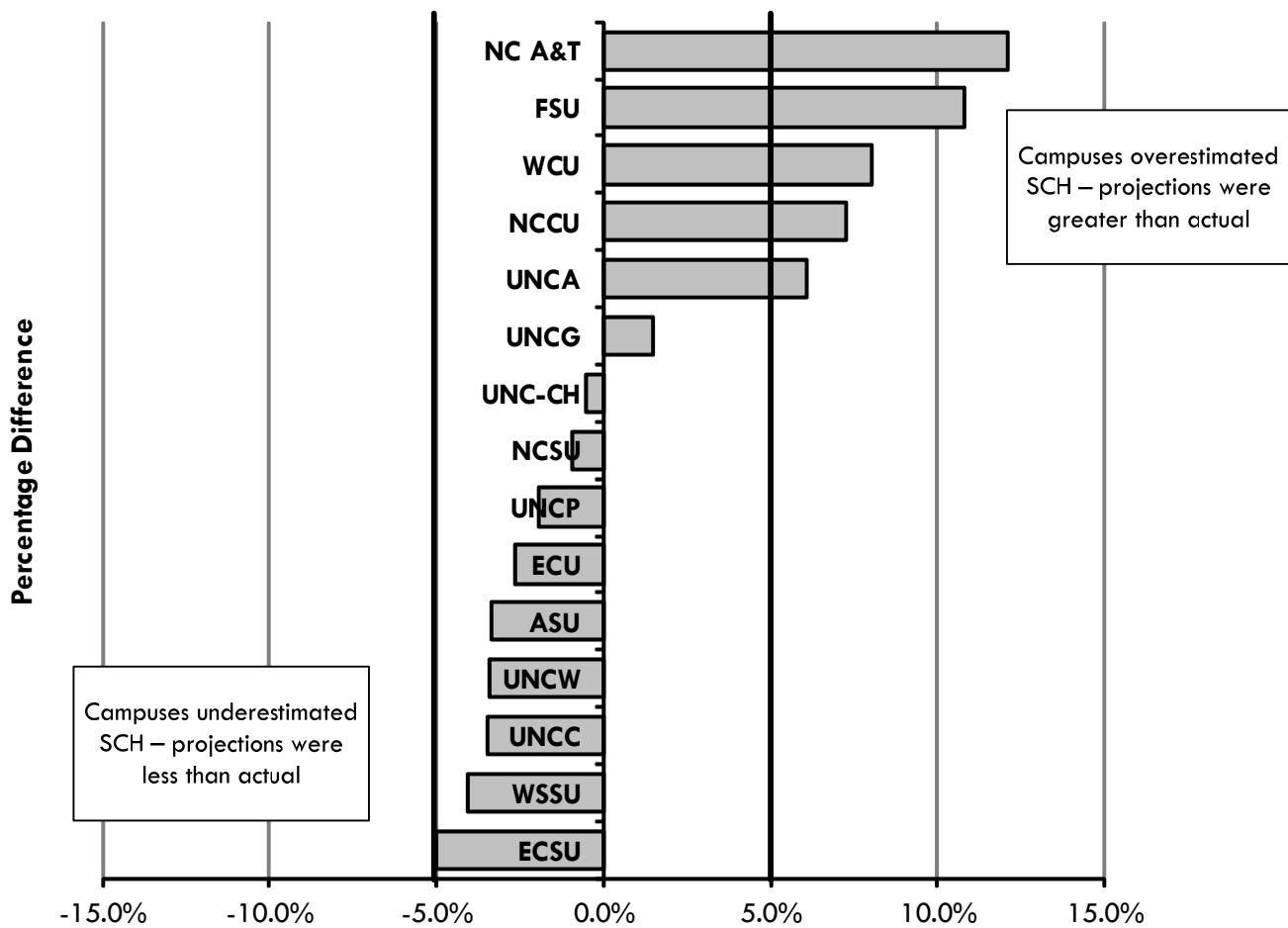
Findings

Finding 1. Funding requests generated by the current student credit hour enrollment change funding formula are based on inaccurate growth estimates.

The formula’s success in determining the appropriate level of funding for growth is contingent upon accurate student credit hour (SCH) projections. Inaccurate SCH projections will result in inaccurate funding. This evaluation found that SCH projections are often inaccurate—often by a wide margin.

Overall accuracy of enrollment estimates varies greatly across campuses. Although some campuses have been relatively accurate in projecting overall SCH, others have not. Exhibit 3 shows the percentage difference between projected and actual campus-level total SCH for the 2008-09 academic year. A negative percentage means the campus underestimated SCH (i.e., the campus projected too few student credit hours) and a positive number means the campus overestimated SCH (i.e., it projected more hours than materialized). Six campuses overestimated or underestimated their SCH by 5% or more for the 2008-09 academic year, with two (Fayetteville State University and North Carolina A&T State University) missing the estimate by more than 10%.

Exhibit 3: Percentage Difference Between Projected and Actual Total Student Credit Hours by Campus, 2008-09



Note: Projections for NC A&T have been held constant since 2006-07 because actual enrollment has not met enrollment projections; therefore, 2006-07 projections were used for this analysis.

Source: Program Evaluation Division based on data provided by UNC General Administration.

Analysis over six years shows the 2008-09 results are fairly typical. To provide an indication of overall accuracy for projections of total SCH, the Program Evaluation Division set a threshold of plus or minus 5% SCH as an accuracy standard. UNC General Administration officials agreed this amount was a reasonable threshold. During the six years of this evaluation study period (2003-04 through 2008-09),

- eight campuses were within this threshold each year (Appalachian State University, East Carolina University, NC State University, UNC Chapel Hill, UNC Charlotte, UNC Greensboro, UNC Pembroke, UNC Wilmington);
- two campuses were outside this threshold one year (Fayetteville State University, Western Carolina University); and
- five campuses were outside this threshold two or more years (Elizabeth City State University, NC A&T State University, NC Central University, UNC Asheville, Winston-Salem State University).

When all of the campuses' projections are added together, the underestimates and overestimates tend to cancel each other out, making the aggregate results closer to actual enrollment. For the 2008-09 academic year, projections of total SCH were within 2% of actual enrollment levels. Whereas UNC General Administration officials have touted this system-level accuracy, it is of little significance in judging the accuracy of funding produced by the formula. The accuracy of this funding is much more dependent on what happens at the campus level. Unfortunately, as the level of detail increases, the accuracy of the projection—and of the resulting funding—diminishes. This discrepancy becomes even more evident when examining results for specific program levels.

Within specific credit-hour cells of the matrix, all campuses show inaccuracies. One of the benefits of the formula is its granularity—that is, it takes into account differences in cost between instructional categories and levels of instruction to create a 12-cell matrix of credit hours. In theory, this granularity yields more appropriate funding—but only if projections within each of the 12 cells are accurate. The Program Evaluation Division found, however, that every campus had large errors in at least some of the 12 cells of the funding formula. For example, in 2008-09, five campuses had projection errors of 100% or more in at least 6 of the 12 cells.

UNC Chapel Hill had the smallest percentage error in total SCH in 2008-09, half of one percent. Despite this small error in the campus's projection of total SCH, there were large errors in many of the 12 cells (see Exhibit 4). Each of the 12 cells was overestimated or underestimated by at least 200 SCH, with 6 of the 12 cells overestimated or underestimated by 1,000 SCH or more. Each level of instruction (undergraduate, master's, and doctoral) had some categories that were overestimated and others that were underestimated. Taken together, the total difference between the projected enrollment change and actual for all 12 cells was 3,235 fewer

SCH than the actual growth that occurred in 2008-09, or an overall underestimate of 30%.¹⁰

In 2008-09 projection error rates calculated with the projected enrollment change within the 12 cells and the actual enrollment change within the 12 cells at all campuses ranged from underestimates of 317% to overestimates of 609%. Some campuses, like UNC-CH, had large errors in many of the 12 cells and other campuses had major errors in just a few cells.

Exhibit 4

Difference Between Projected and Actual Student Credit Hour by Category, University of North Carolina at Chapel Hill, 2008-09

	Projected Change in SCH	Actual Change in SCH	Overestimate (Underestimate)
Undergraduate			
Category I	3,102	2,113	989
Category II	2,736	4,135	(1,399)
Category III	2,122	9,999	(7,877)
Category IV	1,206	-1,165	2,371
Undergraduate Total	9,166	15,082	(5,916)
Masters			
Category I	170	-4,475	4,645
Category II	169	-169	338
Category III	491	117	374
Category IV	-5	267	(272)
Masters Total	825	-4,260	5,085
Doctoral			
Category I	42	1,942	(1,900)
Category II	143	-57	200
Category III	597	1,960	(1,363)
Category IV	106	-553	659
Doctoral Total	888	3,292	(2,404)
Campus Total	10,879	14,114	(3,235)
		Error rate	30%

Notes: Negative numbers in the columns Projected Change in SCH and Actual Change in SCH indicate fewer SCH in 2008-09 than in 2007-08. Underestimates of SCH (the difference between projected and actual) is indicated with the use of parentheses in the final column.

Source: Program Evaluation Division based on data provided by UNC General Administration.

As shown, inaccurate SCH projections occur at the campus level and within the formula's 12-cell matrix. Because funding is appropriated to campuses, the system-level accuracy of enrollment projections is of little significance in judging the accuracy of funding produced by the formula.

¹⁰ The percentages shown in Exhibit 4 are much higher than those shown in Exhibit 3 because the two exhibits are based on different sets of numbers. Exhibit 3 is based on the total number of SCH delivered on each campus, whereas Exhibit 4 is based on the estimated change in SCH.

Finding 2. Inaccurate estimates generate inaccurate funding with minimal consequences for poor enrollment change projections.

Errors in student credit hour (SCH) projections, small or large, lead to inaccurate funding for campuses. Each of the 12 cells in the SCH enrollment change formula is funded at a different rate because the cost of teaching varies by discipline (e.g., humanities vs. engineering) and by level (undergraduate, master’s, doctoral). Thus, the cells in which the errors occur have varying impacts on the funding the campuses receive.

Specific cells in which inaccuracies occur can dramatically affect the level of funding provided. Within the University of North Carolina’s (UNC) funding formula, the level of funding provided in some cells can be up to 10 times as high as the level of funding provided in other cells. Thus, even small errors in some cells can lead to substantial effects on funding. The Program Evaluation Division calculated the total requirements for one credit hour in each of the 12 cells.¹¹ As shown in Exhibit 5, total requirements per credit hour ranged from a low of \$217 (for Category I undergraduate credit hours at the least expensive campus) to \$2,986 (for Category IV doctoral credit hours at the most expensive campus) for the 2008-09 academic year.

Exhibit 5

Range of Total Requirements per Student Credit Hour By Category and Level for the 2008-09 Academic Year

	Lowest Cost Campus	Highest Cost Campus
Undergraduate		
Category I	\$ 217	\$ 341
Category II	\$ 287	\$ 451
Category III	\$ 378	\$ 595
Category IV	\$ 662	\$ 1,040
Master’s		
Category I	\$ 907	\$ 1,425
Category II	\$ 506	\$ 795
Category II	\$ 825	\$ 1,297
Category IV	\$ 1,705	\$ 2,680
Doctoral		
Category I	\$ 1,330	\$ 2,091
Category II	\$ 1,395	\$ 2,193
Category III	\$ 1,399	\$ 2,199
Category IV	\$ 1,900	\$ 2,986

Note: Total requirements shown here are calculated prior to tuition offset.

Source: Program Evaluation Division based on student credit hour enrollment change funding formula data provided by UNC General Administration.

¹¹ As explained in the background section, “total requirements” represents the instructional positions multiplied by the campus average faculty salary, then multiplied by rates for other academic costs, library, and general institutional support.

Because the costs differ so greatly across the various instructional categories and levels, the specific cells in which the errors occur can mean dramatic differences in funding. To show how the cell location of projection errors can have different results, Exhibit 6 provides two detailed scenarios—both hypothetical and developed for illustration purposes. The calculations for each scenario are based on cost information at the UNC campus with the lowest cost per SCH. Each scenario assumes the campus overestimated SCH by 5,000 credit hours.¹² However, the cells in which the overestimates occurred differ between the two scenarios, with substantial differences in effect.

- In Example A, there was a large projection error in undergraduate Category I and small projection errors in the other cells. The cumulative effect of these errors was an overestimate of total requirements by \$265,567.
- In Example B, projection errors (both overestimates and underestimates) were more pronounced across all cells, with the main overestimate coming in master's Category I. The cumulative effect of these errors was an overestimate of total requirements by \$6,385,087, or more than 24 times the effect in Example A.

In both of these examples, the overestimates would result in the campus receiving more money than needed to support actual enrollment changes. Determining the actual amount to be requested under the formula also would require applying the final step of the funding formula—the tuition offset. Without supporting documentation to show how campuses project FTE used to calculate tuition offset, it is impossible to know how projection errors affect estimated tuition, which in turn affects the funding request.

Projection errors can be even more costly than portrayed in these two examples. If these scenarios were computed using cost amounts at the campus with the highest cost per SCH, for example, the overestimate in Example B would increase to \$10,037,038. Projection errors, then, can have very different effects depending not only on the formula cell in which the error occurs but also on the campus that makes the error.

¹² In 2008-09, 12 of the possible 15 UNC campuses overestimated or underestimated total growth by at least 5,000 SCH.

Exhibit 6: Two Hypothetical Examples Illustrating Potential Funding Errors from Inaccurate Student Credit Hour Projections

Example A: Large Error in One Undergraduate Category			
	Projection Error	Cost per SCH	Funding Error
Undergraduate			
Category I	6,250	\$ 217	\$ 1,355,603
Category II	-750	\$ 287	-215,172
Category III	535	\$ 378	202,418
Category IV	-200	\$ 662	-132,359
Master's			
Category I	-475	\$ 907	-430,676
Category II	-25	\$ 506	-12,643
Category III	50	\$ 825	41,267
Category IV	-85	\$ 1,705	-144,889
Doctoral			
Category I	-315	\$ 1,330	-418,968
Category II	0	\$ 1,395	0
Category III	15	\$ 1,399	20,986
Category IV	0	\$ 1,900	0
Total	5,000		\$ 265,567

Example B: Errors in Every Category, with Largest Error in Master's Category			
	Projection Error	Cost per SCH	Funding Error
Undergraduate			
Category I	-655	\$ 217	\$ -142,067
Category II	-1,500	\$ 287	-430,344
Category III	1,250	\$ 378	472,940
Category IV	-2,575	\$ 662	-1,704,119
Master's			
Category I	7,465	\$ 907	6,768,418
Category II	215	\$ 506	108,728
Category III	575	\$ 825	474,566
Category IV	1,100	\$ 1,705	1,875,033
Doctoral			
Category I	-1,300	\$ 1,330	-1,729,076
Category II	975	\$ 1,395	1,360,376
Category III	-750	\$ 1,399	-1,049,301
Category IV	200	\$ 1,900	379,932
Total	5,000		\$ 6,385,087

Note: Although these examples resulted in overestimates of SCH, errors also can result in underestimates.

Source: Program Evaluation Division based on student credit hour enrollment change funding formula data provided by UNC General Administration.

For campuses that underestimate growth for the second year of the biennium, funding consequences appear minimal. For a biennium's second year, the UNC system requests additional funds based on updated enrollment projections. The General Assembly has generally accepted these requested adjustments and included the additional amount in the budget bill. The most significant example occurred during the 2008 legislative session, when the UNC system requested an additional \$34.6 million for enrollment change above the \$39.8 million already funded to support enrollment change for the 2008-09 academic year.

The consequences to a campus for overestimating SCH appear minimal. When a campus falls short of budgeted SCH projections, the UNC Board of Governors can request the Legislature grant "hold harmless" status as part of the enrollment budget request. Hold harmless status ensures the base budget for that campus is not reduced. According to UNC General Administration officials, "Without a hold harmless [the system] would have a campus that is in a downward spiral and it would not come back from that. Hold harmless is a safety net while the campus gets back on its feet." When a campus is awarded hold harmless status, however, the campus does not return any funding it was already awarded to address the anticipated but unrealized growth. In addition, this funding amount is

added to the next year’s base budget, so it has a continuing effect in subsequent years.

The recent experience of North Carolina A&T State University illustrates what happens when anticipated SCH do not materialize. The university projected its SCH would grow to 308,652 in 2006-07, but instead of growing, SCH declined (see Exhibit 7). The university received hold harmless status, under which its budgeted SCH has remained at 308,652 even though its enrollment has continued to decline.¹³ The university has received no enrollment change funding since 2006-07, but it was allowed to keep the \$2,105,749 for the unrealized growth it received that year. In addition, this amount was included in the university’s base budget for 2007-08, and thus the initial overestimation will continue to affect future budgets.

Exhibit 7

NC A&T State University
Was Granted Hold
Harmless Status for
Academic Years 2007-08
and 2008-09

Academic Year	Budgeted SCH	Actual SCH	Enrollment Change Funding Received
2003-04	255,030	268,387	\$ 2,965,792
2004-05	286,164	283,951	\$ 6,472,423
2005-06	293,700	295,927	\$ 73,724
2006-07	308,652	283,404	\$ 2,105,749
2007-08	308,652	278,400	\$ 0
2008-09	308,652	271,214	\$ 0

Notes: Budgeted SCH are projected SCH funded through the formula. NC A&T State University also received hold harmless status for 2009-10 and 2010-11.

Source: Program Evaluation Division based on SCH and funding data provided by UNC General Administration.

Projection errors, then, translate into inaccurate funding with few, if any, consequences when campuses overestimate or underestimate enrollment change. This problem is especially apparent in the second year of the biennium when the UNC system is granted additional funds it requests when the first year’s projections were low, and in the case of NC A&T State University when hold harmless status has been awarded repeatedly.

Finding 3. The formula’s complexity contributes to projection errors, and there is little justification or documentation to support enrollment projections and formula elements.

University of North Carolina (UNC) system leadership believes the enrollment change formula is widely understood. Although the formula’s role in garnering funding for growth may be clear, the Program Evaluation Division found the formula’s elements and the projection process are unduly complicated or are based on sparse or outdated information. Furthermore, very limited documentation describes the process used to assure formula accuracy and explain how projections are derived. The complexity of the

¹³ NC A&T State University continues to be held harmless for 2009-10 and 2010-11 because the campus has still not achieved the SCH projected in 2006-07.

formula and sparse documentation undermine the formula's transparency and credibility.

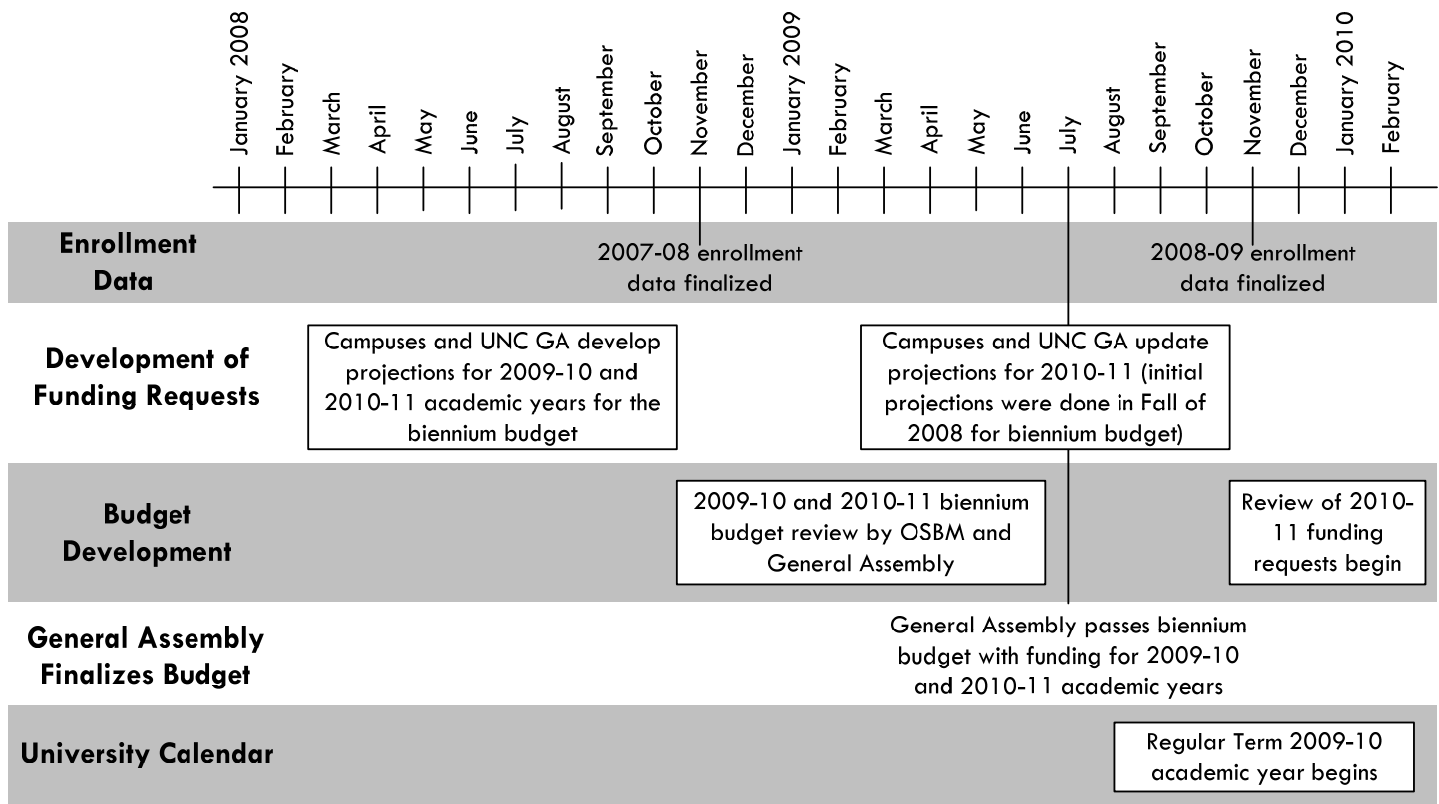
The complexity of the formula begins with the projection process. The process for developing projections of student credit hours (SCH) involves multiple, time-consuming steps. Campuses develop projections for each of the 12 cells but also must estimate which credit hours are fundable through the formula, whether courses will be taught through regular term or distance delivery methods, and how much tuition the campus will receive.

After campuses project total fundable SCH for regular term and distance education, they compare the total SCH in each cell to the prior year's projected SCH in each cell to derive the enrollment change numbers that are entered into the formula. Using this method means the numbers entered into the formula include not only the estimated growth for the coming year but also account for projection errors made in previous years.

Officials with UNC General Administration stated the formula is self-correcting, and over- or under-funding balances out from one year to the next. However, it is difficult to discern the true growth that campuses are projecting from year to year because projections are not based solely on the change in SCH a campus expects to realize in the coming year. Enrollment change is calculated by comparing the current year's projection to the prior year's projection. Actual SCH are not used to calculate the enrollment change that is entered into the formula. Past actual SCH are reviewed while formulating projections, but actual data are not used as the basis for enrollment change funding. Neither UNC General Administration nor campus administrators evaluate how well the formula funds enrollment change and whether a campus is over- or under-funded.

Because of the timing of the budget process, enrollment change projections are made at least 18 months in advance of the academic year they are funding (see Exhibit 8). For example, projections for the 2009-10 and 2010-11 academic years were made in the summer of 2008. At that time, the actual enrollment data for 2007-08 were still being finalized. Whereas actual SCH from prior years is used to inform projections, it is not the basis for determining the enrollment change entered into the formula due to the timing of the budget process. This timeframe means campuses are projecting growth without information about current enrollment. As a result, campuses may be over- or under-funded for one or two years before errors might be identified.

Exhibit 8: Budget Development Timeline, 2009-10 Academic Year



Note: UNC GA is the General Administration of the University of North Carolina system and OSBM is the Office of State Budget and Management.

Source: Program Evaluation Division based on timeline provided by UNC General Administration.

The enrollment projection process is time consuming for campuses and UNC General Administration. According to a timeline provided to the Program Evaluation Division, it takes from four and one-half to eight months to develop campus projections and submit the funding request to the Office of State Budget and Management and the General Assembly. UNC General Administration described this process as “excruciating” and time consuming. At least six UNC General Administration senior staff members are involved, and campuses reported as many as 14 administrators may participate in the development of campus-level projections. Some campuses include every dean and department head in the process. However, this investment in system and campus staff does not necessarily result in accurate SCH estimates for the formula.

Elements of the funding formula are based on sparse or outdated information. UNC calculates funding requests generated from the formula using national instructional position data, undergraduate cost factors, and rates for non-salary elements. Closer examination of each of these sources of information raises questions about the appropriateness of certain underlying assumptions.

- **UNC Assumption:** *Undergraduate cost factor funding added to selected universities increases equity in funding across campuses.*

Evidence: Created by the Board of Governors in the mid-1990s, undergraduate cost factors are comprised of an additional percentage of undergraduate SCH funding allotted to campuses that qualify if they serve disadvantaged students (5% factor), have a non-doctoral mission (10%), have diseconomies of scale (5%), or have a liberal arts focus (10%). UNC system administrators stated “there is no science” behind the percentages and they add very little to formula requests. Program Evaluation Division analysis confirms that on average, undergraduate cost factors generated less than 4% of total requirements for campuses between 2003-04 and 2008-09. However, without accountability measures to track or assess how these funds are used, it is impossible to tell whether they actually achieve equity.

- **UNC Assumption:** *The current percentages applied to determine funding for other academic support, libraries, and general institutional support elements in the formula are appropriate.*

Evidence: Factors for other academic support, libraries and general institutional support were established based on previous expenditures. However, expenditures for enrollment change in non-salary items funded through the formula cannot be examined because funds appropriated through the formula are not tracked separately. The Program Evaluation Division’s analysis of total campus expenditures suggests actual spending across campuses does not adhere to the proportions suggested by funding formula rates. For example, based on overall campus expenditures averaged across five years (2003-04 to 2008-09), campuses spent 37% on general institutional support, whereas the formula provides 33%.¹⁴ However, historical expenditures alone can not be the basis for analysis of efficient and effective use of resources.

Data collected for the present evaluation suggest UNC has little documentation to explain the basis for the formula. The importance of documenting funding formula policies and procedures was emphasized in the 1996 MGT report that recommended the formula’s adoption. However, documentation for the formula has been lacking since its adoption.¹⁵ The consultant hired to produce the initial formula did not provide documentation to explain, for example, how the instructional position factors (i.e., the 12 cells) had been calculated, leaving system administrators to explain the formula as best they could. Created with the assumption that periodic revisions would be required, the formula was revised in 2005-06 to incorporate updated instructional position cost data and to review the multipliers that had been used to generate funding for enrollment growth in libraries and general institutional support. However, the revision also lacks documentation: UNC General Administration

¹⁴ This figure was calculated with funding formula factors of 44.89% of instructional salary amount for other academic support, 11.48% of total academic requirements for libraries, and 54.05% of total academic requirements for general institutional support.

¹⁵ The *Enrollment Change Funding Formula User’s Manual*, which was most recently revised in 2009, describes calculations that produce the funding request but not how campus projections are derived or applied.

responded to the Program Evaluation Division's request for documentation with a computer program used to produce the calculations but no explanation for the revision process. If the program authors were the only ones expected to work on future revisions, then the lack of specificity may be acceptable, but the chief author of the 2005-06 revision is no longer at UNC General Administration.

The lack of guidelines or documented procedures contributes to the variation in accuracy of growth projections across campuses. The lack of documentation extends to the step that precedes application of the formula—projecting SCH change at individual campuses. This process may be even less widely understood than the formula itself. Without policy documents to describe or guide the process, the description that follows was based on interviews with UNC system administrators.

The process of developing enrollment growth projections begins when UNC General Administration sends each campus a computer spreadsheet summarizing actual and budgeted SCH for the previous three years. Projection methodologies used by individual campuses to develop SCH projections vary from a statistical model to a small committee's review of the data provided by UNC General Administration. Campuses submit initial SCH projections for each of the 12 funding formula cells; UNC General Administration then reviews and responds to each campus with feedback including questions about cell values that are not consistent with campus goals. Emphasizing that each campus is different—in terms of the data they draw on, method, experience making projections, and conditions they face, UNC system administrators characterize this process as a “discussion,” and campuses are given latitude to develop the first submission. This iterative process between campuses and UNC General Administration can result in adjustments to projection numbers. UNC General Administration also characterized the projection process as one of analysis but added, “there is also a lot of art.”

While some flexibility may be needed, the fact that the enrollment growth formula is credited as a data-based method to predict funding for growth suggests there should be documentation to ensure some measure of standardized procedures. UNC system officials stated turnover in key staff at the campuses can have a significant effect on the quality of projections. Because there are no established written guidelines on how to develop projections or standards for documenting factors used as a basis for previous projections, this institutional knowledge leaves with individuals. Even when the same campus administrators project enrollment change from year to year, there are no established guidelines to ensure consistent inputs and similar calculations are used from one campus to the next.

There is no written policy to guide procedures for granting a campus hold harmless status. In their report recommending the SCH enrollment change model, MGT consultants suggested adopting a “no loss in funding” provision to protect campuses that fell short of enrollment growth projections. In the period between 2004-05 and 2010-11, six campuses have been granted hold harmless status: Elizabeth City State (2004-05), North Carolina State (2006-07), North Carolina Central (2009-10), UNC Asheville (2009-10), North Carolina A&T State (2007-08, 2008-09, 2009-10, and 2010-11), and Fayetteville State (2010-11). The Program

Evaluation Division requested a written policy for hold harmless for this evaluation, and UNC system administrators reported it did not exist. The Board of Governors has discretion to determine how hold harmless status is merited, then recommends to the General Assembly who should receive it each year. Without documentation, the process behind these decisions is indiscernible. As it is, UNC system administrators report that hold harmless decisions are made on a subjective, case-by-case basis.

The lack of standardized, written guidelines to determine hold harmless status exemplifies problems surrounding the enrollment change funding formula. Complicated and sparsely documented funding formula processes, the time lag between when data are available to inform future SCH projections, and inconsistent projection processes across campuses raise questions about the formula's ability to generate appropriate funding for enrollment change.

Finding 4. University of North Carolina General Administration's lack of oversight through monitoring and data analysis makes it difficult to evaluate funding provided through the enrollment change funding formula.

Each campus knows how much state funding is provided each year for the base budget and for enrollment change, but University of North Carolina (UNC) General Administration does not systematically track the accuracy of campus projections to verify that funding requests are in line with actual enrollment change. Furthermore, campuses have full discretion over enrollment change allocations: campuses do not have to apply the money they receive specifically to the various cost elements contained in the formula. Thus, the degree to which the formula actually funds enrollment change is uncertain.

Despite the UNC system's emphasis on growing to assure access to higher education and the central role of enrollment projections in generating funds needed for growth, there is no analysis to show how actual campus-level enrollment change aligns with projections. Annual campus projections are intended to compensate for past student credit hour (SCH) overestimates or underestimates as well as to estimate future enrollment change. UNC General Administration explained they rely on campuses to realize the need for these compensatory adjustments, adding that if campuses fail to realize the need to adjust projections, then General Administration would "hopefully" catch errors. General Administration was "confident" past downward adjustments had been realized and made, though the process to ensure these adjustments happen is apparently not methodical and does not rely on data analysis or a documented procedure. Final approval of formula projections rests in the hands of the Senior Vice President of Academic Affairs, the Chief Financial Officer, and the system president, but ultimately approval is the responsibility of the UNC Board of Governors.

Although UNC officials claim features of the formula accomplish its intended purpose, there are no available data to support these claims. For example, administrators assert the formula provides equity of funding for campuses in light of the different levels of education and range of course

offerings provided from one campus to the next. However, UNC does not collect data to evaluate this specific claim, especially data that would show whether the complicated process required by the formula is justified. Insufficient evidence challenges several other assumptions about the formula:

- **UNC Assumption:** *The formula provides an appropriate level of funding to meet the needs associated with increasing student enrollment.*

Evidence: UNC does not collect data that could evaluate this intention of the formula. UNC General Administration staff stated they review overall expenditures but do not examine the specific uses of funding requested based on the funding formula.

- **UNC Assumption:** *Enrollment growth funding allows campuses to hire additional faculty needed to accommodate new students, thereby ensuring access to higher education.*

Evidence: Campuses develop projections based on anticipated enrollment growth, but spending is discretionary; campuses may hire faculty or other instructors, and the number and level are up to them regardless of formula appropriations. Because campuses are not required to spend funds according to projections and they are not required to report on how they do expend funds to UNC General Administration or to the General Assembly, there is no way to know to what extent funds support higher access.

- **UNC Assumption:** *When compared with the Full-Time Equivalency (FTE) model, the SCH model provides more accurate funding to accommodate enrollment growth.*

Evidence: The SCH formula provides a more granular method to predict positions requested to ensure access, but UNC General Administration has not analyzed its merit over the more straightforward FTE approach. Because it is not clear that the complexity of the SCH formula improves funding accuracy, it is not possible to determine whether the lengthy process required to work with the SCH formula is necessary.

Questions about accountability for enrollment change appropriations arise largely because campus administrators have discretion over how those funds are spent and spending is not tracked. UNC General Administration reported campuses may face difficult funding decisions and are not required to reconcile expenditures with how the funds were derived using the formula. They noted library funds are “usually spent on libraries,” but added hiring decisions may vary widely from the assumptions that generated the funding formula request. These observations by UNC officials, however, are not based on data: no analysis has been conducted to compare the funding proportions to expenditures. Outcomes (in this case, what was spent where) cannot be traced because of how funding is tracked. Despite the extensive negotiation process required to develop detailed projections, there is no expectation that campuses will spend the money following formula categories and elements.

Finding 5. The current formula emphasizes growth and has no component for assuring accountability for campus performance.

Access to higher education—and the growth necessary to provide it—has been the central goal of the University of North Carolina (UNC) system, and available data indicate the system is achieving this goal. Although access is an important goal, it is not clear how UNC General Administration is managing system growth to ensure both access and student success. Outcome data, specifically student outcomes such as retention and graduation rates, are collected by the UNC system but are not used to inform enrollment change funding. Rather, the formula is driven by inputs, with sole attention on what is needed to accommodate growth.

Although this focus is directly in line with system goals, there are risks associated with too much emphasis on growth. Carolyn Herrington, professor of educational policy at Florida State University and an expert consulted as part of this evaluation, explained there is a thin line between accounting for and providing incentives for growth, adding that the latter sometimes “jeopardizes quality.”

Nationally, economic pressures and heightened awareness of the need for government spending accountability have focused attention on higher education spending. The resulting attention on higher education spending is complicated by two features of higher education: historically high aspirations for higher education and an emphasis on institutional-level control. Public colleges and universities have long been granted a high level of autonomy by government officials who sought to promote universities as the source of new ideas that could only be hampered by political interference.

Whereas regard for universities and preserving their freedom to provide higher education as they see fit remains, the relationship between government and public universities has changed over time. With today’s increased awareness of accountability and outcome assessments, state higher education systems—including UNC—typically report outcomes such as enrollments, student-faculty ratios, and student graduation and retention.

Some states have gone beyond collecting performance data to considering strategies that take student outcomes into account in directing a portion of funding. In a 2006 survey of how states funded their higher education systems, 11 states reported they utilized performance measures to direct some resources for higher education.¹⁶ Advances in technology and heightened attention to accountability by the federal government have created a new opportunity for emphasizing performance funding.¹⁷ A 2008 report on state higher education accountability systems noted several states had gone beyond merely reporting to using information to inform funding.

- **Tennessee** was the first state to adopt performance funding in 1979. Institutions can earn up to 5.45% above their normal allocation according to a scale based on outcomes in student

¹⁶ McKeown-Moak, Mary P. MGT of America, Inc. (August 2006). Survey Results: 2006 Survey of Funding Formula Use.

¹⁷ Carey, K., & Aldeman, C. (December, 2008). *Ready to assemble: A model state higher education accountability system*. Retrieved from www.educationsector.org.

learning; student, alumni, and employer surveys; achievement of state master plan priorities; and assessment outcomes.

- **Pennsylvania** implemented performance funding in 2000-01. By 2005-06, performance funding accounted for 7% of general fund appropriations and totaled \$31 million. Campuses receive a share of the funds if they meet established targets based on measures of student retention and graduation, faculty productivity, employee diversity, and instructional costs per student.
- **Indiana** uses a funding formula and, beginning in the 2007-09 biennium, added performance funding incentives for degree completion, on-time graduation, and two-to-four-year transfer activity. Institutions receive additional funding for growth in the number of degrees completed over the previous year (e.g., \$5,000 for each graduate degree above the previous year). The change came with a directive for campuses to shift attention gradually from enrollments to outcomes.

The UNC system collects information that could be used to measure performance, but data are not used as a basis for funding. Although the UNC system has data that could help inform stakeholders and the public more specifically about program quality, such information is currently not used in the funding process. For example, the system, which has tracked campus-level retention and graduation rates since 1989, reports several indicators of student retention and cohort four- and six-year graduation rates. UNC was recognized in a 2009 report by Education Sector, an education policy think tank, as a best-practice institution for gathering information. However, the report also notes that collecting data is essential but by itself does not comprise an effective accountability system. UNC received a low mark—“needs improvement”—when it came to using the information it collects.

Performance funding has been recommended to and considered by UNC General Administration and the Board of Governors. Five sources recommending a shift toward increased accountability and performance funding were identified in this evaluation.

- The 1996 report by MGT consultants cited House Bill 229, Section 15.6, recommending UNC pursue incentive funding as a component of the formula. The statute directs the Board of Governors to study incentive funding for campuses when they “accomplish specifically stated performance goals in the improvement of the quality of undergraduate education.”
- Recommendation 5.8 of the 2007 *UNC Tomorrow* report cites the need to “continue efforts to establish accountability and performance measures that ensure and demonstrate transparently its success in carrying out its missions.” The report suggests UNC implement an accountability plan that had already been approved by the Board of Governors. (This recommendation urged greater accountability but did not endorse performance funding.)
- UNC President Erskine Bowles endorsed adopting some level of performance funding. In a statement to the Program Evaluation

Division, he noted the funding formula may need alteration to “encourage graduation and retention as well as access.”

- A draft memo dated November 2009 described the planned adoption of performance measures as part of strategic planning. For example, 2007 freshman-to-sophomore retention rates were more than 2% below the national average for five campuses and only six campuses increased their freshman-to-sophomore retention rate between 2003 and 2007. Performance could be improved by linking enrollment growth funding to meeting graduation and retention benchmarks.
- Most recently, the UNC Board of Governors affirmed its intention to implement performance funding in the 2010-11 budget allocation request: “future enrollment allocations will be based on a revised SCH enrollment change funding model that takes into account performance relative to student retention and graduation goals.”

A draft document dated October 2010 describes possible steps to implement this intention. Noting that targets have been set for freshman-to-sophomore retention, four- and six-year graduation rates, and graduation rates of community college transfers with an associate’s degree, the document lists additional targets to be considered. The draft plan suggests enrollment growth funding would be contingent on substantial progress toward retention goals.

The draft plan states that beginning in 2011-13, a campus could not increase enrollment if it was not meeting or making progress toward its graduation goals. Each campus’s success would be determined relative to a set of peer institutions approved by the Board of Governors. The draft plan notes some incentive funding could be added as a result of eliminating two undergraduate cost factors—liberal arts designation and non-doctoral mission—and using those funds for a new cost factor to promote graduation rates. The draft plan suggests additional funds including a request of additional appropriations (or funds from strategic initiative funding or trust funds, should the General Assembly deny the request) could be added to launch the incentive fund.

Together these documents indicate UNC system officials have considered performance funding since 1996 but have yet to adopt it. The recent draft plan and the UNC Board of Governors budget allocation language suggest the system may be poised to take this critical step to consider the quality of education along with funding growth. To date, however, a formal plan does not exist.

Recommendations

The student credit hour (SCH) enrollment change funding formula is widely accepted by University of North Carolina (UNC) General Administration as a valid means to fund one of the UNC system's primary goals: to increase access to higher education. The formula is more detailed than its precursor, the full-time equivalency formula, and the greater detail is intended to provide greater funding equity across campuses. However, this evaluation found implementation of the formula is deficient. Methods used to derive inputs are not standardized, are undocumented, and funds generated by projections cannot be tracked. As a result, the appropriateness of the amounts the formula generates to support enrollment is unknown.

Whereas access to higher education remains an important goal for the UNC system, the state's financial situation increases the need to consider program quality as another essential component in funding decisions. In many ways, the UNC system is well positioned to move toward performance-based funding because it collects the necessary data and has already examined performance-based funding in considerable depth. The UNC draft performance-based funding plan suggests both withholding growth funding and adding new funding as a performance incentive. Although current budgetary constraints make additional funding difficult, linking a campus's receipt of enrollment growth funding to its performance, as measured by appropriate indicators, would introduce an emphasis on performance.

Exhibit 9 below summarizes four recommendations based on the findings in this report. Each of these recommendations is explained in further detail in the text that follows.

Exhibit 9

Summary of Recommendations

Recommendation	Specific Actions
<p>1. Require the UNC Board of Governors, with the assistance of UNC General Administration, to thoroughly examine and modify the existing student credit hour enrollment change funding formula and standardize the enrollment projection process</p>	<ul style="list-style-type: none"> • Simplify and standardize the enrollment projection process • Re-examine and justify funding factors for libraries and general institutional support • Present the revised enrollment projection process, revised cost factors, and resulting weighted cost per student credit hour to the General Assembly no later than June 30, 2011 • Implement the new model for enrollment change funding beginning with the 2011-13 biennium • Analyze accuracy of projections and adjust funding to correct errors prior to including in annual base
<p>2. Require the UNC Board of Governors, with the assistance of UNC General Administration, to develop written policies for enrollment change funding decisions</p>	<ul style="list-style-type: none"> • Establish procedures for developing campus enrollment projections, calculating tuition offset, and calculating funding formula elements and cost factors • Develop criteria for granting hold harmless status • Produce a policy and procedures manual no later than January 1, 2012
<p>3. Require the UNC Board of Governors to provide annual reports with performance indicators for holding the UNC system accountable to the public</p>	<ul style="list-style-type: none"> • Determine appropriate campus indicators, such as retention rates, graduation rates, trends in student credit hours, accuracy of enrollment projections, and explanation of sizeable projection errors • Report campus indicators annually to the General Assembly beginning no later than June 30, 2012
<p>4. Begin implementation of performance-based funding by linking each campus's receipt of enrollment growth funding to its achievement of target outcomes</p>	<ul style="list-style-type: none"> • Develop appropriate campus-level performance indicators and goals • Require each campus to meet target outcomes in order to receive enrollment growth funding beginning with State Fiscal Year 2011-12 • As appropriate given future budgets, consider working with UNC General Administration to develop an incentive funding program to encourage campuses to focus more on performance

Source: Program Evaluation Division.

Recommendation 1. The General Assembly should require the University of North Carolina Board of Governors, with the assistance of UNC General Administration, to thoroughly examine and modify the student credit hour enrollment change funding formula and standardize the enrollment projection process. The current formula is characterized by a high level of detail intended to provide equity in campus funding and greater accuracy. The intent behind this detail is sound: the cost of delivering instruction varies by the type of course and the level at which it is taught, and this variation justifies the theory behind the 12-cell matrix of the student credit hour (SCH) funding formula. However, inaccurate

projections within the 12 cells compromise the accuracy and reliability of the resulting funding request.

Campus enrollment projections in each of the 12 cells are prone to error, and all campuses make errors at this level even if the overall campus projection is on target. In addition, the projection process is a time-consuming burden for campuses and UNC General Administration. A more straightforward method that does not require cell-level projections could streamline and add clarity to the process.

An alternative to the current approach would be to use a more streamlined set of steps that still manage to utilize the detailed cost factors of the SCH model. Although another alternative would be to return to the full-time equivalency model, the following approach would retain the granularity of the 12-cell matrix while eliminating errors associated with campuses making detailed SCH projections in each of the cells. Furthermore, it would eliminate the need to calculate funding for regular term and distance education separately.¹⁸ An illustrative example is shown in Exhibit 10. Calculations were based on the factors in the current SCH model only to serve as an illustration of the steps. Enrollment change funding calculations would be based on the following four steps, which are described in more detail in Appendix C.

Step 1: Calculate the total weighted cost per SCH for instruction for each campus. Procedures in carrying out this calculation differ from the current process, which does not require separate projections for each of the 12 cells. Instead, as shown in Exhibit 10, Step 1, there would be one average SCH cost for each campus. The procedures would be as follows:

- calculate the cost of instruction per SCH for each of the 12 cells that includes instructor salary and funding for other instructional costs such as fringe benefits, support staff, and related instructional supplies;
- use the past three years of actual enrollment data to calculate the percentage of SCH attributable to each of the 12 cells to account for the unique mix of credits on each campus and the differences in the cost of teaching different disciplines and levels; and
- multiply the cost of instruction per SCH by the proportion in each cell and add the cells together to determine the campus total weighted cost per SCH for instruction.

Before implementing this step, UNC General Administration would first need to analyze the other instructional costs used as part of this calculation. Other instructional costs should be modified by UNC General Administration using UNC and national data.¹⁹

¹⁸ There was no difference found in the cost to deliver distance and on-campus courses. Program Evaluation Division. (2010, April). *University Distance Courses Cost More to Develop Overall but the Same to Deliver as On-Campus Courses*. Report to the Joint Legislative Program Evaluation Oversight Committee. Raleigh, NC: General Assembly.

¹⁹ One source of national data is the Delta Cost Project (<http://www.deltacostproject.org/data/overview.asp> and <http://nces.ed.gov/ipeds/about/>). This project has organized data on institutional spending and revenues into aggregate measures of costs per student and costs per degree/certificate produced. These measures are drawn from the Integrated Postsecondary Education Data System, which includes data collected from every college, university, and technical and vocational institution that participates in federal student financial aid programs.

Step 2: Project the change in SCH. As shown in Exhibit 10, Step 2, procedures for carrying out this projection would be substantially less complicated than under the current process, because the change in SCH would not require projections for each of the 12 cells. Instead, campuses would calculate an overall projection of total growth in SCH (the example in Exhibit 10 is based on a projection of 5,000 SCH) using a uniform process to be developed by UNC General Administration. The steps campuses would follow in using this process would be as follows:

- campuses review historical enrollment change data to inform an overall estimate of change in SCH; and
- each campus projects the change in total SCH.

Before implementing this step, UNC General Administration would first need to develop a standard and uniform process to project enrollment growth.

Step 3: Calculate total funding requirements. Procedures in carrying out this calculation may be similar to the current process, utilizing more fully studied and justified funding amounts for libraries and general institutional support. Once those amounts have been determined, the procedures would be as follows:

- calculate the cost for library and general institutional support to accommodate the projected change; and
- add these amounts to the instructional cost to derive the total funding to support enrollment change.

Before implementing this step, UNC General Administration would first need to study and justify the appropriate level of funding needed for libraries and general institutional support. As with the steps needed to successfully implement Step 1, funding requirements for libraries and general institutional support should be analyzed and modified using UNC and other national data.

Step 4: Calculate total funding requested. Procedures in carrying out this calculation would be essentially the same as under the current process:

- estimate the amount of tuition expected to be paid based on the estimated change in SCH (in Step 2); and
- subtract the expected tuition from the total funding requirements (calculated in Step 3) to determine the funding requested for the campus to support enrollment change.

Before implementing this step, UNC General Administration would first need to develop a standard and uniform process to estimate tuition review based on enrollment growth projections.

The revised approach described in the four steps above has the following advantages:

- **Simplified projection process.** Under this approach, campuses would need to project only campus-wide *change* in SCH. Currently, campuses project SCH for the 12 cells of the formula. SCH projections at this level of detail are erroneous. This alternate formula will require campuses to only project the total enrollment change in SCH.

- **Greater transparency in funding.** Currently, it is difficult to see the funding provided per SCH. This method shows the funding requirements per SCH and would calculate funding for each item (e.g., library, general institutional support) based on projected enrollment change.
- **Greater ability to track and analyze projections.** The current method for projecting SCH growth does not allow projections to be tracked and analyzed for accuracy. Campuses project the total number of SCH in each category they estimate will be on campus, not just the change in enrollment. The projection of total SCH is then compared to the prior year's projection of total SCH to calculate the enrollment change for the coming year. This method introduces errors because it uses two estimates of SCH (current year and prior year). Using just one projection allows for analysis and tracking of the accuracy of projections, which are not possible with the current projection method. Tracking the accuracy of enrollment funding from year to year should be a routine part of the enrollment funding process. This type of analysis adds accountability for funds appropriated for growth. Sizeable projection errors (e.g., $\pm 5\%$) should result in funding corrections, much like what is currently in place for exceeding the limit on nonresident freshmen enrollment in tuition estimates. If a campus does not realize the projected SCH for two consecutive fiscal years, adjustments should be made to their state operating budget.

This alternative formula does not include undergraduate cost factors because UNC General Administration does not have written justification for their application or the percentages used. In addition, a draft memo written by UNC General Administration on performance funding recommends eliminating two of the current undergraduate cost factors. If the Board of Governors believes the cost factors are important features of the model, they should direct UNC General Administration to provide the appropriate percentages that should be applied based on available data and recommend including these factors in the formula to the General Assembly. For example, the number of additional positions required to support disadvantaged students should be derived based on data from campuses with experience serving this population.

Exhibit 10: Alternative Enrollment Change Funding Formula Example

	Salary Cost per SCH	Other Instructional Costs per SCH	Total Cost of Instruction per SCH	Proportion of Actual SCH (3-year average)	Weighted Cost per SCH	
Undergraduate						
Category I	\$ 105.84	\$ 47.51	\$ 153.35	37.9%	\$ 58.19	
Category II	\$ 139.99	\$ 62.84	\$ 202.84	19.9%	40.38	
Category III	\$ 184.62	\$ 82.88	\$ 267.50	18.7%	49.99	
Category IV	\$ 322.93	\$ 144.96	\$ 467.89	1.9%	8.79	
Master's						
Category I	\$ 442.43	\$ 198.60	\$ 641.03	1.0%	6.17	
Category II	\$ 246.77	\$ 110.77	\$ 357.54	5.6%	20.01	
Category III	\$ 402.73	\$ 180.78	\$ 583.51	8.1%	47.21	
Category IV	\$ 831.76	\$ 373.38	\$ 1,205.14	0.5%	6.14	
Doctoral						
Category I	\$ 649.01	\$ 291.34	\$ 940.36	2.7%	25.34	
Category II	\$ 680.83	\$ 305.62	\$ 986.45	1.0%	9.66	
Category III	\$ 682.69	\$ 306.46	\$ 989.15	2.6%	25.67	
Category IV	\$ 926.96	\$ 416.11	\$ 1,343.07	0.1%	1.97	
Step 1: Calculate the total weighted cost per SCH for instruction for each campus					Total Weighted Cost per SCH for Instruction	\$ 299.53

Step 2: Project the change in SCH and enter into the formula

	Estimated Change in Total SCH	Funding per SCH	Funding Requirements
Instruction	5,000	\$ 299.53	\$ 1,497,633
Library	5,000	\$ 34.39	\$ 171,928
General Institutional Support	5,000	\$ 161.89	\$ 809,471

Step 3: Calculate total funding requirements

Total Funding Requirements	\$ 2,479,033
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Estimated Tuition	\$750,000
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Step 4: Calculate total funding requested

Total Funding Requested	\$1,729,033
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Note: Faculty salary for this example is \$75,000, the approximate median for UNC campuses in 2008-09. Instructional position factors and factors for other instructional support, libraries, and general institutional support in this model are from the current SCH enrollment change funding formula for illustrative purposes only. UNC General Administration will need to update these factors.

Source: Program Evaluation Division based on SCH enrollment change funding formula provided by UNC General Administration.

The UNC Board of Governors, with assistance from UNC General Administration, should develop a standardized method for projecting enrollment change, determine the appropriate factors, and present the updated weighted cost per SCH formula to the General Assembly no later than October 1, 2011. The new formula should be used to fund enrollment change for the 2012-13 academic year.

Recommendation 2. The General Assembly should require the UNC Board of Governors, with the assistance of the University of North Carolina General Administration, to develop written policies for enrollment change funding decisions. The 1996 MGT report that recommended adoption of the funding formula clearly stated thorough documentation of “both the formula-based and more subjective funding decisions” is essential to any formula-based funding approach.²⁰ Findings from this evaluation suggest this documentation is lacking. A companion document to the *Enrollment Change Funding Formula User’s Guide* would provide the level of documentation recommended by MGT. To this end, UNC General Administration should be directed to develop a policies and procedures manual to provide guidelines for the following processes.

Developing campus enrollment projections. The manual would provide guidelines for campuses so they all would use similar, documented approaches. The manual also would help to ensure consistent decision-making over time by UNC system and campus administrators. Guidelines should establish parameters for data used to develop campus enrollment change projections, list and describe steps involved in developing projections, and define the documentation required to explain factors that influenced campus and UNC General Administration decisions. Although each campus may face unique conditions that affect projections, standardized types of and timeframes (e.g., three years of historical enrollment data) for the data that should be used to inform projections is essential. The manual also should explain the step-by-step process involved in developing projections to promote consistency. The manual should provide guidance without restricting flexibility at the campus level.

In interviews, UNC General Administration observed changes in campus staff responsible for developing projections contributed to delays and inaccuracies in campus projections. A policies and procedures manual would help alleviate this problem by providing a consistent, standardized approach for new staff to follow. Similarly, the manual would likely increase the equity the formula is intended to provide because each campus would follow comparable procedures.

Policies should also address unrealized enrollment growth that had been funded in previous years. Discrepancies between projected and actual student credit hour (SCH)—whether shortages or overages—should be calculated for each campus. At a minimum, UNC General Administration should assure that enrollment funding appropriated for SCH that did not materialize should not be added to campus base funding.

Calculating the tuition offset. A written policy describing calculations and guidelines to ensure campuses calculate tuition offset in a uniform manner is needed. Currently, each campus has a different method to estimate tuition revenue with little guidance from UNC General Administration. Written policies and procedures should be developed to guide campus estimates based on historical enrollment data for in-state and out-of-state students. UNC General Administration also should consider convening a workgroup of campus representatives to establish and disseminate best practices to estimate tuition revenue.

²⁰ MGT of America. (November, 1996). *A Revised Funding Model for the University of North Carolina: Phase 2 Final Report* (p. 3-1).

Calculating funding formula elements and cost factors. As described in Finding 3, formula elements generate funding to cover enrollment growth in non-faculty salary instructional costs, libraries, and general institutional support. Undergraduate cost factors are applied to enrollment change to add funds for campuses with specific needs or missions. Each of these formula components requires review and justification following established procedures that should be described in the policies and procedures manual.

UNC data are appropriate to generate instructional position factors because they are based on data reflecting how instruction has been delivered. The appropriateness of using historical UNC data to determine whether formula elements are adequate, however, is another matter. The existing rates were based on the relative distribution of funds across the UNC system as proportions of total faculty salary costs. The *User's Manual* directs UNC General Administration to review rates for library and general institutional support if there is a "significant change" that requires it. This review, however, will not reflect whether the rates are appropriate as compared with norms across peer institutions. As noted by UNC General Administration in an interview with the Program Evaluation Division, funding formula costs should be periodically compared with national data. Comparing UNC rates to those at peer institutions will help determine whether UNC rates have been appropriate. The policies and procedures manual should describe a periodic review of similar rates at peer institutions and use the information to inform adjustments to UNC rates as needed.

Granting hold harmless status. When MGT suggested adopting the formula, it recommended providing leeway for years when campuses miss enrollment targets but appear to be on track for making up the gap in the future. However, the recommendation was to hold funding constant for one to two years, and UNC has not developed written guidelines for determining to whom, when, and for how long hold harmless status should be granted. Without a written policy on hold harmless status, decisions are made on a case-by-case, *ad hoc* basis. NC A&T State University is a case in point: they have been granted a fourth consecutive year of hold harmless status even as their enrollment has continued to decline. The policies and procedures manual should provide guidelines for granting hold harmless status and limit each campus to a two-year period as originally recommended by MGT.

The policies and procedures manual should be guided and approved by the UNC Board of Governors and presented to the General Assembly's Joint Legislation Education Oversight Committee no later than January 1, 2012.

Recommendation 3. The General Assembly should require the University of North Carolina Board of Governors to provide annual reports with performance indicators for holding the system accountable to the public. Reporting to the General Assembly would require University of North Carolina (UNC) General Administration to systematically track and analyze data from each campus. Currently, there is no systematic

analysis of the funding provided to UNC campuses for enrollment change. Campus administrators have complete discretion over spending of appropriations for growth, making it impossible to discern if appropriations for enrollment change are in line with the number of students or faculty and staff hired. Campus-level reporting is necessary to provide the minimum accountability for enrollment change funding to the General Assembly and citizens of North Carolina.

UNC General Administration should work with campus staff to create an annual report to be approved by the Board of Governors and presented to the General Assembly. Data collected for this evaluation revealed campus data necessary for this reporting are available but appear in a variety of forms in a variety of reports. Annual reports should contain trend data by campus including

- student credit hour (SCH) delivered each year,
- annual estimated change in SCH,
- number of students served,
- number of new faculty and staff positions by area of responsibility,
- previous year enrollment funding,
- analysis of projection accuracy,
- retention rates,
- graduation rates, and
- explanations of projection errors greater than 5% along with the results of investigations into those errors and the measures taken to resolve those errors.

The format of this report needs to be a clear electronic presentation of current year numbers and graphical presentations of trends and analyses performed; Program Evaluation and Fiscal Research Divisions should be consulted on the final format. This report should be approved by the UNC Board of Governors and presented to the General Assembly annually, with the first report submitted by January 1, 2012.

Recommendation 4. The General Assembly should begin implementation of performance-based funding by linking each campus's receipt of enrollment growth funding to its achievement of target outcomes. Performance-based funding—making some proportion of funding contingent on achieving target outcomes set by each campus, such as student graduation or retention—is necessary to counterbalance the enrollment change funding formula's sole emphasis on growth. Documentation provided by University of North Carolina (UNC) General Administration and statements by outgoing system president Erskine Bowles suggest performance funding has been considered since 1996 but has yet to be implemented. UNC's current draft plan suggests the system is well positioned to implement performance-based growth funding beginning in State Fiscal Year 2011-12.

The UNC draft plan suggests providing performance funding from both existing (i.e., enrollment growth) and additional (cost factors that could be earned if targets are reached) sources. Performance funding from additional sources is unlikely in the current economic climate. Although this

approach has been used in other states (see Finding 5), the likelihood of additional funds for such an initiative at present is low.

The approach to performance-based funding that appears most feasible in the current economic climate would be to tie performance to enrollment growth funding—that is, to make enrollment growth funding contingent on attainment of UNC campus targets. Campus targets have been set (for freshman to sophomore retention, four- and six-year graduation rates, and graduation rates for community college transfers with an associate degree), and data are already collected on campus performance. Data from the previous reporting period (one or more academic years, to be determined by UNC General Administration) should be used to determine whether a campus would be eligible to request funding for enrollment growth the following year. A campus could only request enrollment growth funding (that is, an increase in funding to deliver additional SCH) if that campus had met its targets. If a campus fails to achieve its targets, it would be ineligible to receive enrollment growth funding.

The approach recommended here does not require additional funding. It provides an opportunity to enhance campus and UNC system accountability and to demonstrate the system's commitment to performance. Growth funding should only be given to campuses that achieve targets. Campuses that work toward but fail to achieve goals should not receive funding because targets should be meaningful (e.g., reflect improvements in graduation and retention) but achievable.

Performance-based funding will require time to implement, but work already done to establish campus targets will hasten the process. Remaining steps to be taken by UNC General Administration include writing detailed policies and procedures to guide performance-based funding, holding system-wide meetings to ensure the approach and implementation timeline are fully understood, and working closely with campuses to ensure they have every opportunity to meet their targets, especially campuses at risk for falling short.

The existing planning draft developed by UNC officials notes two years of performance data will be available by the start of State Fiscal Year 2011-12 and the enrollment growth funding request for the biennium starting in that year should be tied to performance. Recommendation 4 assumes this timeline. The Fiscal Research Division and the Joint Legislative Education Oversight Committee should provide oversight for the initial and on-going implementation of performance-based funding. The General Assembly should require UNC General Administration to review and revise campus performance targets periodically, analyze the effectiveness of this approach, and consider whether additional approaches should be considered to emphasize performance.

Once the budget situation eases, the General Assembly could consider working with UNC General Administration to provide incentive funding to encourage campuses to focus more on performance. Funds could be used to reward accomplishments and to support new approaches to attaining identified outcomes. At present, however, this approach is not recommended in light of budgetary constraints.

Appendices

Appendix A: University of North Carolina Full-Time Equivalency Funding Formula

Appendix B: University of North Carolina Student Credit Hour Enrollment Change Funding Formula

Appendix C: Alternative Funding Formula Calculation

Agency Response

A draft of this report was submitted to the University of North Carolina General Administration to review and respond. Its response is provided following the appendices.

Program Evaluation Division Contact and Acknowledgments

For more information on this report, please contact the lead evaluator, Michelle Beck at michelle.beck@ncleg.net.

Staff members who made key contributions to this report include Catherine Moga Bryant, Carol H. Ripple, and Pamela L. Taylor. Intern Korinne Chiu also contributed. John W. Turcotte is the director of the Program Evaluation Division.

Appendix A: University of North Carolina Full-Time Equivalency Funding Formula

Two specialized campuses and seven professional schools receive enrollment change funding based on the full-time equivalency (FTE) funding formula:

- Campuses
 - North Carolina School for Science and Mathematics
 - University of North Carolina (UNC) School of the Arts
- Professional Schools
 - Brody School of Medicine at East Carolina University
 - School of Law at North Carolina Central University
 - College of Veterinary Medicine at North Carolina State University
 - Schools of dentistry, law, medicine, and pharmacy at UNC Chapel Hill

An FTE is defined as

- an undergraduate student who is enrolled for 12 or more hours per regular semester,
- a graduate student who is enrolled for 9 or more hours per regular semester, or
- the sum of several part-time students whose hours are translated into an equivalent for a full-time student according to a conversion table.

Undergraduate Students		Graduate Students	
Student Credit Hours	FTE	Student Credit Hours	FTE
12 or more credit hours	1.00	9 or more credit hours	1.00
9-11 credit hours	0.75	6-8 credit hours	0.75
6-8 credit hours	0.50	3-5 credit hours	0.50
1-5 credit hours	0.25	0-2 credit hours	0.25

The FTE funding formula calculates funding for enrollment change based on the percent change in the number of annual average full-time equivalent students (AAFTE). The model takes current-year expenditures for instruction, libraries, and general institutional support and multiplies them by the same percentage that AAFTE are projected to grow (or decline) in the upcoming academic year. Next, the expected tuition revenue is subtracted from the total funding requirement for enrollment change to arrive at the appropriation request. In the example below, the campus projects an increase of 50 FTE, which represents .73% of the 6,788 projected AAFTE for the upcoming academic year.

Projected FTE Enrollment Change		50
Projected FTE Enrollment for Campus		6,788
Projected Percent Enrollment Change		0.73%
Requirements		
Requirements	Base	Projected Requirements
Instruction	\$ 57,280,625	\$ 418,149
Libraries	\$ 8,312,155	51,616
General Institutional Support	\$ 42,600,116	269,138
Total Requirements		\$ 738,903
Receipts		
Estimated Receipts	AAFTE	Tuition
Resident Undergraduate	0	\$ 0
Nonresident Undergraduate	0	0
Resident Graduate	32	117,440
Nonresident Graduate	18	279,540
Total Estimated Receipts	50	\$ 396,980
Appropriation Request		\$ 341,923

Note: Total instruction is comprised of faculty costs plus other academic expenses.

Appendix B: University of North Carolina Student Credit Hour Enrollment Change Funding Formula

Overview

The University of North Carolina (UNC) student credit hour enrollment change funding formula calculates the number of new teaching positions required based on presently authorized resource levels and the amount of financial support needed to support enrollment growth on each campus. State support is provided for instructional and related activities during the regular term and for distance education. Though the funding formula is used to request money from the General Assembly and allocate state funds to each institution, institutions retain control on how these funds are distributed on their campus.

The funding formula supports costs for fundable student credit hours (SCH) associated with projected enrollment growth for each campus. Fundable SCH include

- hours taken for credit or remedial instruction at a UNC institution;
- resident instruction provided to in-state and out-of-state students within North Carolina in the fall/winter/spring terms (i.e., does not include resident instruction provided in the summer term); and
- distance education instruction provided to North Carolina residents and nonresident students within North Carolina in all terms.

The funding formula is calculated separately for regular term and distance education enrollment.

The 12-Cell Formula Matrix

The core of the SCH enrollment change funding formula consists of a matrix of costs for each instructional category (i.e., academic discipline) and instructional level (undergraduate, master's, doctoral) at a given campus. Each discipline in the UNC system is classified into one of four instructional categories. The table below shows each discipline by category.

CATEGORY I	CATEGORY II	CATEGORY III	CATEGORY IV
<ul style="list-style-type: none"> • Communications • English Language & Literature • Mathematics • Military Technologies • Philosophy & Religion • Theological Studies • Psychology • Protective Services • Social Sciences & History • History • Other 	<ul style="list-style-type: none"> • Area Studies • Business Management & Administrative Services • Education • Foreign Language & Literature • Home Economics • Law & Legal Studies • Liberal Arts & Sciences • Marketing Operations • Multi/Interdisciplinary Studies • Parks, Recreation, Leisure & Fitness Studies 	<ul style="list-style-type: none"> • Agricultural Business & Production • Agricultural Sciences • Conservation & Renewable Natural Resources • Architecture & Related Programs • Computer & Information Sciences • Engineering-related Technology • Health Professional Residual (Allied Health) Library Science • Biological Sciences/Life Sciences • Physical Sciences • Science Technologies • Public Administration & Services • Visual & Performing Arts 	<ul style="list-style-type: none"> • Engineering • Nursing

The SCH enrollment change funding formula also takes into account the different costs associated with teaching undergraduate, master's, and doctoral level courses. Since instructional costs per student credit hour increase as instructional level increases, the funding formula calculates these costs separately. The three instructional levels and four categories together create a 12-cell matrix, with a different instructional cost for each cell.

Student Credit Hour Projections

The next step in calculating the enrollment change funding request for each campus involves estimating projected student credit hours. These are estimated for each cell in the matrix and are expressed as an increase or decrease in the number of student credit hours from the prior year.

Below is a hypothetical example of the projected SCH for a campus. In this example, the campus estimates 4,700 additional SCH for the next academic year.

Instructional Category	Instructional Level		
	Undergraduate	Master's	Doctoral
Category I	1,000	200	100
Category II	1,000	200	-100
Category III	1,000	200	50
Category IV	1,000	50	0
Total by Level	4,000	650	50
Institution Total			4,700

SCH per Instructional Position

Instructional position factors reflect the relative number of SCH delivered by a faculty member in each category and level. Cost data from the National Study of Instructional Costs and Productivity ("the Delaware study") are used to derive these factors. This study was first conducted in 1992 by the University of Delaware to assess departmental instructional costs and establish national disciplinary benchmarks for resource allocation and utilization at higher education institutions. Over 500 institutions voluntarily participate in what is now an annual study, including the State University of New York System, the California State University System, and the Louisiana Board of Regents; 15 institutions within the UNC system have participated since 1999.¹ Participating institutions submit cost and productivity information on an annual basis.

The instructional position factors were last updated in 2005 to reflect productivity data from the 2002-03 and 2003-04 Delaware Study and UNC data on average class size. The current instructional position factors are shown in the table below. The same factors are used for all UNC institutions.

Instructional Category	Instructional Level		
	Undergraduate	Master's	Doctoral
Category I	708.64	169.52	115.56
Category II	535.74	303.93	110.16
Category III	406.24	186.23	109.86
Category IV	232.25	90.17	80.91

Instructional Positions Required

Projected SCH are divided by instructional position factors to determine the number of faculty positions needed as a result of projected enrollment growth. The example below shows this calculation.

¹ North Carolina School of Science and Mathematics does not participate in this study.
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Example: Category I Undergraduate

$$1000 \text{ (SCH)} / 708.64 \text{ (Instructional position factor)} = 1.41$$

Instructional Category	Projected SCH Change (A)	Instructional Position Factor (B)	Positions Required (A/B)
Undergraduate Category I	1,000	708.64	1.41

Instructional categories are then summed by instructional level (i.e., undergraduate, master's, doctoral), then totaled for the campus to determine the additional positions needed to support projected enrollment growth. These totals can be seen in the table below in the row labeled Positions Required (Subtotal).

Instructional Category	Instructional Level		
	Undergraduate	Master's	Doctoral
Category I	1.41	1.18	0.87
Category II	1.87	0.66	-0.91
Category III	2.46	1.07	0.46
Category IV	4.31	0.55	0.00
Positions by Level	10.05	3.47	0.41
Positions Required (Subtotal)			13.93

Undergraduate Cost Factors

The UNC Board of Governors determined that institutions serving specific populations of undergraduates require funding levels beyond what is included in the formula. In 2004, the Board of Governors established four criteria to account for differential costs in instruction for undergraduate students.

Undergraduate Cost Factor	Eligibility Criteria/Rationale	Percentage	Eligible Institutions (2008-09)
Service to disadvantaged students	More than one-third of resident undergraduate students receive Pell Grants	5%	Elizabeth City State University Fayetteville State University North Carolina A&T University North Carolina Central University UNC Pembroke Winston-Salem State University
Non-doctoral mission	Institution without doctoral research mission	10%	Appalachian State University Elizabeth City State University Fayetteville State University North Carolina Central University UNC Pembroke UNC Wilmington Western Carolina University Winston-Salem State University
Diseconomies of Scale	Institution has less than 6,000 students (headcount)	5%	Elizabeth City State University UNC Asheville
Liberal Arts Mission	Designated public liberal arts institution	10%	UNC Asheville

Institutions may meet the criteria for more than one undergraduate cost factor. For example, an institution with a non-doctoral mission that also serves disadvantaged students is eligible for a 15% undergraduate cost factor (10% for the non-doctoral mission and an additional 5% for service to disadvantaged students). Eligible cost factors are added together (i.e., 10% for non-doctoral mission and 5% for service to disadvantaged students) and then multiplied by the undergraduate positions generated by the enrollment growth model (subtotal positions required in table below). Eligibility for undergraduate cost factors are reviewed on an annual basis and are applied only to regular-term instruction. The positions generated from the undergraduate cost factor are

included in the total positions generated by the SCH enrollment change funding formula for regular term instruction only.

	Undergraduate	Master's	Doctoral	Total
Subtotal Positions Required	10.05	3.47	0.41	13.93
Undergraduate Cost Factor (15%) Positions	1.51			
Total Positions Required	11.56	3.47	0.41	15.44

Total Academic Requirements

Total Academic Requirements has two components, Instructional Salary Amount and Other Academic Costs.

Instructional Salary Amount - The instructional salary amount is calculated for each campus based on the budgeted average teaching salary. In Fiscal Year 2008-09, the instructional salary rate of campuses ranged from \$64,086 at Fayetteville State University to \$100,740 at University of North Carolina at Chapel Hill. This rate is multiplied by the total positions required to determine the instructional salary amount.

Total Positions Required	15.44
Average Faculty Salary	\$ 75,000
Instructional Salary Amount	\$ 1,158,000

Other Academic Costs - Other academic costs provide funds for instructional expenses beyond faculty salary including fringe benefits for instructional positions, support staff in the academic departments, and related instructional supplies and expenses. To calculate Other Academic Costs, the instructional salary amount is multiplied by a fixed percentage (44.89%). According to the *User's Manual* for the UNC Semester Credit Hour Enrollment Change Funding Model, "This rate was corroborated by estimating the typical costs in an academic department beyond direct teaching salaries."

UNC General Administration calculates the rate applied for Other Academic Costs as: $(\text{Total Instruction} - \text{Faculty Salary}) \div \text{Faculty Salary}$

Other academic costs and the instructional salary amount are added together to calculate the Total Academic Requirements in the funding formula.

Instructional Salary Amount	\$ 1,158,000
Other Instructional Costs (44.98%)	\$ 520,868
Total Academic Requirements	\$ 1,678,868

Library Rate

The SCH funding formula provides funds for library resources as institutions increase enrollment. A fixed percentage (11.48%) is multiplied by total academic requirements. According to the *User's Manual* for the UNC Semester Credit Hour Enrollment Change Funding Model, "This rate was determined through an analysis of the operating budgets of relevant activities at the 15 campuses covered by the SCH model compared to the budget for total academic requirements."

UNC General Administration calculates the library rate as: $\text{Library} (1151) \div \text{Total Instruction}$

Total Academic Requirements	\$ 1,678,868
Library Amount (11.48%)	\$ 192,734

General Institutional Support

General institutional support provides funding for functions that support instructional activities such as academic support services, student services, institutional support, campus administration, and physical plant operations. To calculate general instructional support, the total academic requirements amount is multiplied by a fixed percentage (54.05%). According to the *User's Manual* for the UNC Semester Credit Hour Enrollment Change Funding Model, "The GIS rate was determined through an analysis of the operating budgets of relevant activities at the 15 campuses covered by the SCH model compared to the budget for total academic requirements."

UNC General Administration calculates the General Institutional Support rate as: GIS rate = [General Academic Support (1 152) + Student Services (1 160) + Institutional Support (1 170) + Physical Plant (1 180) – utilities] ÷ Total Instruction

Total Academic Requirements	\$ 1,678,868
General Institutional Support (54.05%)	\$ 907,428

Total Academic Requirements, Library Costs, and General Institutional Support are added together to derive Total Requirements to support enrollment growth for the following academic year.

Total Academic Requirements	\$ 1,678,868
Library Costs (11.48%)	192,7341
General Institutional Support (54.05%)	907,428
Total Requirements	\$ 2,779,030

Tuition Offset

To determine the total enrollment change funding to request from the General Assembly, tuition revenues from projected enrollment growth are subtracted from the Total Requirements calculated above. The tuition offset from resident instruction is calculated on a full-time equivalency (FTE) basis using the Annual Average FTE and the full-time annual tuition rate for the institution. The tuition offset from distance education instruction is calculated based on a SCH basis using the change in distance education student credit hours and the SCH tuition rate. Estimated tuition revenue calculations are made for five student populations:

- in-state resident undergraduate students;
- out-of-state resident undergraduate students;
- out-of-state students considered residents per G.S. 116-143.6;
- in-state graduate students; and
- out-of-state graduate students.

In the example below, the campus has estimated expected tuition revenue of \$1 million. This amount is subtracted from the total requirements to determine the amount to request from the General Assembly to support enrollment growth.

Total Requirements	\$ 2,779,030
Tuition Offset	(1,000,000)
Amount Requested	\$ 1,779,030

Compared to the FTE funding formula, the SCH enrollment change funding formula is more complex. This percentage differs by campus and school. The table below explains differences between the FTE and SCH enrollment change funding formulas.

Component	FTE Enrollment Change Funding Formula	SCH Enrollment Change Funding Formula
Estimated Enrollment Change	(percent change) divided by (total FTE)	change in SCH enrollment by instructional level and program area
Number of Instructional Levels	1	3
Number of Program Areas	1	4
Faculty Positions Required	not calculated	same factors applied to all institutions
Faculty Costs	((total instruction) multiplied by (percent change)) divided by (total FTE)	(average faculty salary per institution) multiplied by (total faculty positions required)
Other Academic Expenses	included in faculty costs	44.89% of faculty costs
Libraries	((library) multiplied by (percent change)) divided by (total FTE)	11.48% of total instruction
General Institutional Support (GIS)	((GIS) multiplied by (percent change)) divided by (total FTE)	54.05% of total instruction

Appendix C: Alternative Funding Formula Calculation

The Program Evaluation Division developed an alternative approach to the current Student Credit Hour (SCH) Enrollment Growth Funding Formula. The approach described below is a hybrid that takes the simplicity of a Full-Time Equivalency (FTE) model and combines it with the detailed cost factors of the current SCH formula. It retains the granularity of the 12-cell matrix while eliminating the errors introduced by requiring campuses to make detailed SCH projections in each of the cells. With this model, campuses project the overall total change in SCH to calculate funding required. Below is a step-by-step description of this alternative formula based on a campus estimating overall enrollment change of 5,000 SCH.

1. Determine cost of teaching one SCH in each of 12 instructional categories

- Calculate Instructional Position Factors – the number of credits that can be taught by one instructor during one academic year by category (Column **A**)
- Convert Instructional Position Factors to the number of instructors required for one SCH (**B**)
 - $1/A = B$
- Multiply the Converted Instructional Position Factors (**B**) by the Campus Salary Amount (**C**) to derive the Salary Cost per SCH (**D**)
 - $B * C = D$
- Calculate Other Instructional Costs per SCH (fringe benefits, support staff, related instructional supplies, and expenses) (**E**)
 - $E = D * 44.89\%$
 - Note: UNC General Administration needs to review this rate (44.89%), update as necessary, and provide justification for the percentage used.
- Add Salary Cost per SCH (**D**) and Other Instructional Costs per SCH (**E**) to derive Total Cost of Instruction per SCH (**F**)
 - $D + E = F$

	A	B	C	D	E	F
	Instructional Position Factors (SCH per Faculty)	Converted Instructional Position Factors (Faculty per SCH)	Campus Salary Amount	Salary Cost per SCH	Other Instructional Costs per SCH (44.89%)	Total Cost of Instruction per SCH
Undergraduate						
Category I	708.64	0.0014	\$64,086	\$ 90.44	\$ 40.60	\$ 131.03
Category II	535.74	0.0019	\$64,086	\$119.62	\$ 53.70	\$ 173.32
Category III	406.24	0.0025	\$64,086	\$157.75	\$ 70.82	\$ 228.57
Category IV	232.25	0.0043	\$64,086	\$275.94	\$123.87	\$ 399.80
Master's						
Category I	169.52	0.0059	\$64,086	\$378.04	\$169.70	\$ 547.75
Category II	303.93	0.0033	\$64,086	\$210.86	\$ 94.65	\$ 305.51
Category III	186.23	0.0054	\$64,086	\$344.12	\$154.48	\$ 498.60
Category IV	90.17	0.0111	\$64,086	\$710.72	\$319.04	\$1,029.77
Doctoral						
Category I	115.56	0.0087	\$64,086	\$554.57	\$248.95	\$ 803.52
Category II	110.16	0.0091	\$64,086	\$581.75	\$261.15	\$ 842.90
Category III	109.86	0.0091	\$64,086	\$583.34	\$261.86	\$ 845.20
Category IV	80.91	0.0124	\$64,086	\$792.07	\$355.56	\$1,147.62

2. Calculate the weighted cost per SCH for the campus

- Determine the Proportion of SCH (**G**) in each category (based on the campus's historical 3-year average)
 - These numbers are calculated based on the actual proportion of all SCH by category for the campus
- Multiply the Total Cost of Instruction per SCH (**F**) by the Proportion of SCH (**G**) to derive the weighted cost per SCH (**H**) by category
 - $F * G = H$
- Add the 12 weighted costs to derive the Total Weight Cost per SCH (**J**) for the campus

	F	G	H
	Total Cost of Instruction per SCH	Proportion of SCH (3-year Average)	Weighted Cost per SCH
Undergraduate			
Category I	\$ 131.03	37.9%	\$ 49.73
Category II	\$ 173.32	19.9%	\$ 34.51
Category III	\$ 228.57	18.7%	\$ 42.71
Category IV	\$ 399.80	1.9%	\$ 7.51
Master's			
Category I	\$ 547.75	1.0%	\$ 5.27
Category II	\$ 305.51	5.6%	\$ 17.10
Category III	\$ 498.60	8.1%	\$ 40.34
Category IV	\$ 1,029.77	0.5%	\$ 5.25
Doctoral			
Category I	\$ 803.52	2.7%	\$ 21.65
Category II	\$ 842.90	1.0%	\$ 8.26
Category III	\$ 845.20	2.6%	\$ 21.94
Category IV	\$ 1,147.62	0.1%	\$ 1.68
	J	Total Weighted Cost per SCH	\$ 255.94

3. Calculate funding required for instruction to support enrollment change

- Multiply the Estimated Change in Total SCH (**K**) by the Total Weighted Cost per SCH (**J**) to determine the Funding Requirement for Instruction
 - $K * J = L$

K	J	L
Estimated Change in Total SCH	Total Weighted Cost per SCH	Funding Requirements for Instruction
5,000	\$255.94	\$1,279,698

4. Calculate Total Funding Requirements

- Multiply Estimated Change in Total SCH (**K**) by the Library Funding Requirements per SCH (**M**)
 - $K * M = N$
 - Note: UNC General Administration needs to review this rate, update as necessary, and provide justification for the percentage used.
- Multiply Estimated Change in Total SCH (**K**) by the General Institutional Support Funding Requirements per SCH (**P**)
 - $K * P = Q$
 - Note: UNC General Administration needs to review this rate, update as necessary, and provide justification for the percentage used.
- Add Funding Requirements for Instruction (**L**), Funding Requirements for Library (**N**), and Funding Requirements for General Institutional Support (**Q**) to derive Total Funding Requirements (**R**)
 - $L + N + Q = R$

K	J	L
Estimated Change in Total SCH	Total Weighted Cost per SCH	Funding Requirements for Instruction
5,000	\$255.94	\$1,279,698

K	M	N
Estimated Change in Total SCH	Library Funding Requirements per SCH (11.48% of Total Weighted Cost per SCH)	Funding Requirements for Library
5,000	\$29.38	\$146,909

K	P	Q
Estimated Change in Total SCH	General Institutional Support Funding Requirements per SCH (54.05% of Total Weighted Cost per SCH)	Funding Requirements for General Institutional Support
5,000	\$138.34	\$691,677

R	Total Funding Requirements	\$2,118,283.76
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5. Calculate Total Funding Request

- Subtract Estimated Tuition (**S**) from the Total Funding Requirements (**R**) to derive Total Funding Requested (**T**)
 - $R - S = T$

R	Total Funding Requirements	\$2,118,283.76
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S	Estimated Tuition	\$750,000
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T	Total Funding Requested	\$1,368,284
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The University of North Carolina

GENERAL ADMINISTRATION

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School of
the Arts

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University of
North Carolina
at Wilmington

Western Carolina
University

Winston-Salem
State University

November 1, 2010

Mr. John Turcotte, Director
Program Evaluation Division
North Carolina General Assembly
Legislative Office Building, Suite 100
Raleigh, North Carolina 27603-5925

Dear Mr. Turcotte:

Thank you for the opportunity to review and comment on the Program Evaluation Division's Enrollment Growth Funding Formula Report. As you are aware, the enrollment funding model was developed in the 1990s in response to a legislative directive. My understanding is that the perception among legislators at that time was that funding enrollment growth on an FTE basis failed to recognize differences in the cost of education by discipline and by level of education and the legislature was seeking an improved methodology that recognized these differences. The model was developed using expertise provided by a firm that is highly respected in academic circles (MGT of America, Inc.) and presentations were made to legislative committees as the model was developed and implemented. It is our belief that the model has served the University and the taxpayers of North Carolina well, has withstood scrutiny over time, and has assisted legislators in fulfilling the State's constitutional obligation¹ to provide public higher education, as far as practicable, free of expense to the students. That, of course, does not mean that it cannot be improved as you suggest. Our belief is that should we revert to a simplified model it would take our campuses back to a time when differences in the cost of education were not recognized nor funded appropriately. However, there is no question that a simplified model would be easier to manage and, if the members of the General Assembly wanted us to adopt such a simplified method, we would implement one as soon as practicable. We would, however, want to fully examine with you any unintended consequences that could result from such a change. We would also hope to obtain an outside expert such as MGT. We would hope to avoid a model that would provide an incentive to our campuses to teach the courses that we now fund at a lower than average rate and a disincentive to teach more costly courses like nursing and engineering.

¹ N.C. Constitution, Article IX Section 9.

Although we challenge some of the data in the report, it is clear that your division has done its homework and that it understands the mechanics of our funding model. Your comments about our inability to be responsive to you on a timely basis are true and I apologize – we have many demands on our time and our President has tried to reduce administrative expenses throughout the University – perhaps he has been too successful in reducing the staffing within General Administration. I believe our employees have worked hard to be responsive as they meet competing demands. I know that you are also aware that two long-term employees in our Finance Division, including the Vice President, retired while this study was underway. No excuses, we will do our best to be more responsive in the future.

While we are prepared to implement several of the recommendations of the report, there are points made throughout the report with which we take issue. We believe that our data is accurate. The data that feeds that model is the best projection data that we have at the time that the model is updated. Prior to the first year of the biennium, we project student credit hours to be delivered for two years – students won't sign up for the courses in the spring semester of the second year until 18 months after the initial projections are made. In the interim period, there are economic downturns and other external factors that affect the number of students that enroll and the kinds of courses that they take. We make our best effort to project as accurately as possible and we take our projections seriously. Projections are developed using an over 100-page guidance manual, which is reviewed and revised annually by UNC General Administration. Enrollment management is an art and not a science which is why we hire knowledgeable people to manage the process at all of our campuses. Potential students apply to college, we accept some of the applicants, and some of those students that are accepted enroll in our institutions. There will never be a completely accurate way to predict how many students 18 months from now will be enrolled at our campuses or taking a specific course funded through a specific cell in our model. This is also why we adjust our projections in the second year of the biennium and why, during the recent economic downturn, the adjustments in our projections were significant. We make our best good faith effort.

The report focuses on accuracy of the 12-cell model at the individual cell level rather than the overall accuracy of the model. Exhibit 4 cites a 30% error rate based on an analysis of incremental credit hours. A true performance assessment would evaluate total credit hours of instruction projected against those delivered. The revised Exhibit 4 (attached) demonstrates that UNC-CH's projected student credit hours of instruction were 602,035 while the campus actually delivered 605,270, with the additional hours unfunded. The report extensively highlights the impact to the State for overestimating, but does not discuss the impact to the campuses for underestimating student credit hours. The model in its entirety was over 99% accurate in both 2008 and 2009 in projecting the

number of student credit hours taught at UNC (see Attachment A). This compares to a widely used standard of 2% above or below projections as an acceptable range of model accuracy.

The report says that we should be more accountable for our predicted student credit hours and ensure that we deliver as predicted. No one believes in accountability more than our President and we will give serious thought to ways to effectively improve. We do analyze actual student credit hours delivered in each of the twelve cells in the matrix against student hours projected and take this into account as we project enrollment growth in the next year. We don't specifically request that our chancellors justify differences between projected and actual student credit hours delivered by cell in the model but the projected to actual comparisons by cell are an integral part of our projection process. This is a part of the self-correcting aspect of the model, which is not adequately acknowledged in the report. However, we will work to identify additional ways to hold our chancellors more accountable.

The report correctly cites that once funds are allocated to a campus, allocations within the campus are at the discretion of campus leadership and are not uniform among the campuses. This is true and was always intended to be true provided that the additional student credit hours of instruction were delivered. We will work with our campuses to strengthen accountability over the internal allocations of funding.

The report recommends that the University implement performance funding and cites current efforts underway to do this. When Erskine Bowles was elected President five years ago the University's focus was on growth and "access" to an education and he truly believed that growth alone is not an appropriate incentive for our campuses. The Board of Governors has now supported his position that the focus should be on student success, providing students not only with an opportunity for an education but ensuring that they graduate with a meaningful degree. The process has taken time. The Board of Governors first implemented higher admissions standards to ensure that the students that enrolled had the ability to be successful. The Board then set goals for retention and graduation rates and our chancellors are now focused on meeting those goals. Our campuses have initiated new programs, like summer academic bridge programs and improving their student advising and counseling, to enable them to meet their retention goals. Now that our campuses have had time to change behavior and meet those goals, we are incorporating performance into our enrollment growth model. As your report points out, we are eliminating two undergraduate cost factors (non-doctoral campuses and liberal arts mission) that have been in the model since its inception and we are replacing them with factors that provide clear incentives for our campus to meet the performance goals established by our Board (retention, graduation, efficiency in degree production).

We are in sync with your recommendations regarding performance funding. The Board of Governors will be considering adjustments to the funding model at its November meeting that reward and encourage performance and will apply those adjustments in the 2011-2012 academic year. We are also working with the North Carolina Community College System to funnel lower division enrollment growth to the community colleges and ensure that students that take courses at one of our community colleges are able to transfer credit for those courses to a UNC institution.

Next, your report cites the dollars that we have received through the enrollment funding model but does not recognize that budget reductions have offset the availability of all of those dollars. There is no doubt that our General Assembly has been very generous in providing funding for the University. There is also no doubt that budget reductions resulting from our recent economic climate have eroded enrollment funding as well as other appropriation support.

Your concerns over campuses that are held harmless are valid. We do not have a process with criteria that we consider when we request that the General Assembly hold a campus harmless when enrollment declines. There are valid reasons to hold a campus harmless and we transparently present our request to hold a campus harmless to the General Assembly for consideration and action by the legislature. Specifically, your report cites that we have requested that the General Assembly hold North Carolina A&T University harmless for a number of years and the General Assembly has done this. In the past five years, we have had four different chancellors at North Carolina A&T State University and the current Chancellor unfortunately is dealing with poor decisions made by past leaders. Holding the campus harmless is allowing academic and admissions decisions to be made without penalizing the campus with budget reductions beyond those already imposed by the General Assembly. We appreciate the General Assembly's support for North Carolina A&T State University but recognize that our decision to request that a campus be held harmless is discretionary and should be more clearly defined and documented.

We are appreciative that your staff has taken the time to fully understand the mechanics of our funding model and we always want to be accountable to the General Assembly and the taxpayers of North Carolina.

Sincerely,



Jeffrey R. Davies

Accuracy of UNC System Enrollment Projections - 2003-04 to 2009-10					
	Projected SCHs	Actual SCHs	Nominal Difference	Percent Difference	Actual as % of Budgeted
2003-04	4,208,343	4,287,579	79,236	1.9%	101.9%
2004-05	4,404,905	4,461,285	56,380	1.3%	101.3%
2005-06	4,592,673	4,643,181	50,508	1.1%	101.1%
2006-07	4,783,972	4,756,676	(27,296)	-0.6%	99.4%
2007-08	4,933,060	4,927,865	(5,195)	-0.1%	99.9%
2008-09	5,095,094	5,080,307	(14,787)	-0.3%	99.7%
2009-10	5,224,753	5,250,576	25,823	0.5%	100.5%

NOTE: The accuracy of enrollment projections has improved over time. Projections have been within 1% of actual enrollment in each of the last four years.

Exhibit 4 (Revised) UNC-Chapel Hill							
	Total Budgeted Student Credit Hours 2007-08	Total Budgeted Student Credit Hours 2008-09	Projected Change in SCH	Total Actual Student Credit Hours 2008-09	Actual Change in SCH	Overestimate (Underestimate)	Difference Actual and Projected
Undergraduate							
Category I	225,098	228,200	3,102	227,211	2,113	989	0.4%
Category II	118,464	121,200	2,736	122,599	4,135	(1,399)	-1.2%
Category III	105,078	107,200	2,122	115,077	9,999	(7,877)	-7.5%
Category IV	11,794	13,000	1,206	10,629	(1,165)	2,371	20.1%
Undergraduate Total	460,434	469,600	9,166	475,516	15,082	(5,916)	-1.3%
Masters							
Category I	9,680	9,850	170	5,205	(4,475)	4,645	48.0%
Category II	34,431	34,600	169	34,262	(169)	338	1.0%
Category III	47,359	47,850	491	47,476	117	374	0.8%
Category IV	3,005	3,000	(5)	3,272	267	(272)	-9.1%
Masters Total	94,475	95,300	825	90,215	(4,260)	5,085	5.4%
Doctoral							
Category I	13,808	13,850	42	15,750	1,942	(1,900)	-13.8%
Category II	6,517	6,660	143	6,460	(57)	200	3.1%
Category III	14,603	15,200	597	16,563	1,960	(1,363)	-9.3%
Category IV	1,319	1,425	106	766	(553)	659	50.0%
Doctoral Total	36,247	37,135	888	39,539	3,292	(2,404)	-6.6%
Campus Total	591,156	602,035	10,879	605,270	14,114	(3,235)	-0.5%

Note: Had UNC-CH achieved 100% accuracy in their SCH projections with no over- or underestimation in any of the categories or levels, their enrollment request to the state would have been approximately \$150,000 higher. The data shown in Exhibit 4 actually shows that the variance among cost categories results in a very minor error in the accuracy of the projections and the enrollment funding that follows.