MEMORANDUM

To: Judy Rhodes, Director, Office of Education Accountability
From: Bob Palaich, John Augenblick, Doug Rose and Justin Silverstein,
            Augenblick, Palaich and Associates, Inc.
Date: May 29, 2004

Re: An update of the Mississippi Adequate Education Program and Creation
            of Adjustments for Special Student Needs

This memo reviews the work Augenblick, Palaich and Associates, Inc. (APA) completed
in the fall of 2003 to update the cost components of Mississippi's Adequate Education
Program (MAEP). This memo describes the methods we used, what we found, and what
it means for the school finance system in Mississippi. The work on the base cost figure
builds on the approach we used a decade ago modified to reflect the state's new
accountability system and associated data; we feel that the logic of the approach, the
reasonableness of the districts selected, and the accuracy of the data yield a valid result.
The work on the adjustments for special student needs used a different approach – one
that has been used in other states. When the results are expressed as student weights
relative to the base cost figure they are comparatively high, which might reflect a
relatively low base cost. We believe the weights are correct – but if they were used it
would be very important to assure that the student counts to which the weights would
apply are precise.

Introduction

For all the effort involved, our work can be viewed as producing a few figures that can
serve as the key elements of a school finance system: (1) a base cost figure that can serve
as the foundation level in a foundation program and (2) a set of adjustments to the base
cost that is designed to consider the most important, uncontrollable factors that affect the
cost of providing education services in different school districts.

Under our contract, we were asked to help the state recalibrate the MAEP base amount
and to create adjustments to that base for costs associated with special needs students.
The following list describes the objectives of our work:

- replace the old accreditation indicator of quality with an indicator (or set of indicators) derived from the recently adopted state accreditation and assessment systems;
- modify the adjustment for at-risk students to reflect the resources needed to help those students meet state standards; and
- convert the categorical programs associated with special education, gifted and vocational students into adjustments to the base cost.

Updating MAEP

Changing the quality indicators in the base cost calculation is a critical update to the MAEP. Such an update will help Mississippi convert its first generation definition of adequacy, which was driven largely by "input" resources and the opinions of informed professionals, into one that reflects the performance of students, an "outcome" driven approach consistent with current state and federal expectations about student achievement. As the result of the MAEP update, school districts should receive the resources necessary to help the typical student, one with no special needs, meet state standards. The analysis was undertaken in four steps: (1) data collection and analysis; (2) a visit with Mississippi Department of Education staff and selected educators to discuss how new accreditation system indicators could be integrated into the MAEP calculation; (3) computation of the new values for each functional area; and (4) preparation of this document.

The calculation of the MAEP is based on the "successful school district" approach (SSD) to estimate school finance "adequacy." This approach is appealing to many policy makers because it calculates cost on the basis of the spending in districts that actually meet a set of student results criteria. Unlike some other approaches, the SSD is not based on speculation and judgment, but rather, on actual achievement and associated expenditures. The SSD approach requires that we identify districts that meet some criterion indicative of success. Further, we included district selection criteria related to the efficiency with which services are provided. The use of both effectiveness and efficiency criteria assure that the selection of districts is based on factors of importance to state policy makers while avoiding the selection of districts that are unusual for some reason.

We met with panels of educators to set the "success" criteria for each functional area of the MAEP – instruction; administration; maintenance and operations; and ancillary services. In the original version of the MAEP, the quality indicator used was the district's accreditation level under the old accreditation system, which was driven largely by "input" requirements. The new accreditation system is driven much more by student performance and the availability of statewide assessment results for districts and schools allows the state to use a more robust set of indicators for school district success in meeting state performance "outcomes." In October, the four separate panels agreed on a common set of criteria to measure "success" for the functional areas:

- The district must meet the new state accreditation standards;

- The district must avoid scoring less than two standard deviations below the mean on all of the 26 tests required by the state;
- The district must score above one standard deviation below the mean on 24 of the 26 tests required by the state; and
- The district must reach an average achievement level of 3.5 across all schools (on a 1-5 scale).

These four indicators of success were used as the quality component of the district selection process in each of the four functional areas of the MAEP calculation. It should be noted that the first and fourth criteria are "positive" ones; the fourth indictor being a very high standard. The second and third indicators are "negative" criteria, which require minimum performance levels on all tests – a district cannot meet the criteria by doing extremely well in a few areas; rather, it has to do minimally well in all areas (which also turns out to be difficult standard to meet).

For each functional area of the MAEP, measures of efficiency, tailored to each area, were also developed and employed. The efficiency criteria were designed to exclude districts with high (or extremely low) resource levels in order to avoid the inclusion of districts that either might have "bought" high levels of performance or were lucky enough to be able to achieve them without expending many resources. Although some people might suggest that efficiency should focus on those districts that meet a performance standard while expending the least resources, our experience is that whatever is happening in such districts is unusual and cannot be duplicated routinely in other places.

In the instructional area, the efficiency variable used was based on the number of teachers per 1,000 students. We created a range of reasonableness for that variable, which had a minimum level two standard deviations below the mean and a maximum level one half of a standard deviation above the mean. That is, we excluded districts with modestly high resource use or extremely low resource use; many districts with resource use above the average were excluded while many of those districts with resource use below the average were included. In fact, a district was excluded if it had more than 66.58 teachers per 1,000 students or less than 50.27 teachers per 1,000 students (based on an average of 63.32 teachers per 1,000 students and a half standard deviation of 3.26 teachers per 1,000 students).

In the administration area, the efficiency variable used was based on the number of administrators per 1,000 teachers. The range of reasonableness for that variable was based on the same statistical levels as the one used for instruction (districts with an administrative ratio more than one half standard deviation above the mean or more than two standard deviations below the mean were excluded). Districts were excluded that had more than 76.12 administrators per 1,000 teachers or fewer than 29.79 administrators per 1,000 students (based on a statewide average of 66.85 administrators per 1,000 teachers and a standard deviation of 9.27 administrators per 1,000 teachers).

In the maintenance and operations area, two efficiency variables were used – the number of custodians and maintenance staff per 100,000 square feet and dollars spent on

maintenance and operations per square foot. The mean across all school districts in Mississippi for the number of custodians and maintenance staff per 100,000 square feet was 4.71. The mean across all school districts in Mississippi for the number of dollars spent on maintenance and operations per square foot was $2.94. Districts that met all of the quality indicators and met the following two additional conditions – had fewer than 6.59 custodians and maintenance staff per 100,000 square feet and more than 0.93 staff per 100,000 square feet; and spent less than $3.93 per square foot and more than $.97 per square feet – were selected for inclusion in the calculation of the MAEP functional area for maintenance and operations. The 6.59 figure for staff and the $3.93 figure for dollars spent are one standard deviation above the respective state means. The .93 figure for staff and the $.97 figure for dollars spent per square foot are two standard deviations below the respective state means.

In the ancillary services area, three efficiency variables were used – guidance counselors per 1,000 students, librarians per 1,000 students, and the percentage of classrooms with five or more high quality computers. The mean across all school districts in Mississippi for the number of guidance counselors per 1,000 students was 2.28. The mean across all school districts for the number of librarians per 1,000 students was 1.74. The mean across all school districts for the percentage of classrooms with five or more high quality computers was 16.00. Districts that met all of the quality indicators and met the following three additional conditions – had fewer than 3.11 guidance counselors per 1,000 students and more than 0.61 guidance counselors per 1,000 students; had fewer than 2.16 librarians per 1,000 students and more than 0.92 librarians per 1,000 students; and had a percentage of classrooms with five or more high quality computers smaller than 35.18 – were selected for inclusion in the calculation of the MAEP functional area for ancillary services. The 3.11 figure for guidance counselors, the 2.16 figure for librarians and the 35.18 percentage for classrooms with five or more high quality computers are one standard deviation above the respective state means. The 0.61 figure for guidance counselors and the 0.92 figure for librarians are two standard deviations below the respective state means.

Table 1 presents the districts selected for computation of the new results oriented MAEP calculation. It is important to note that in future years, the districts selected by the process will change and the resulting MAEP base cost figure will change even though the criteria for selecting districts remains the same.

Table 1: Districts Selected under New MAEP Criteria for Each of the Four Functional Areas

DISTRICT NUMBER	DISTRICT NAME	INSTRUCTION	ADMIN.	M&O	ANCILLARY	TOTAL SELECTIONS
920	HOUSTON SCHOOL DIST	X	X	X	X	4
2000	GEORGE CO SCHOOL DIST	X	X	X	X	4
2521	CLINTON PUBLIC SCHOOL	X	X	X	X	4
2900	ICSD	X	X	X	X	4
3022	PASCAGOULA SCHOOLS	X	X	X	X	4
3112	WEST JASPER CONSOLIDAT	X	X	X	X	4

DISTRICT NUMBER	DISTRICT NAME	INSTRUCTION	ADMIN.	M&O	ANCILLARY	TOTAL SELECTIONS
3620	OXFORD SCHOOL DIST	X	X	X	X	4
3900	LAWRENCE CO SCHOOL DIS	X	X	X	X	4
4300	LINCOLN COUNTY SCHOOLS	X	X	X	X	4
4500	MADISON CO SCHOOL DIST	X	X	X	X	4
4620	COLUMBIA SCHOOL DIST	X	X	X	X	4
4800	MONROE CO SCHOOL DIST	X	X	X	X	4
5100	NEWTON CO SCHOOL DIST	X	X	X	X	4
5530	POPLARVILLE SCHOOL DIST	X	X	X	X	4
5711	NORTH PIKE SCHOOL DIST	X	X	X	X	4
5800	PONTOTOC COUNTY SCHOOL	X	X	X	X	4
5820	PONTOTOC CITY SCHOOLS	X	X	X	X	4
5921	BOONEVILLE SCHOOL DIST	X	X	X	X	4
6100	RANKIN COUNTY SCH DIST	X	X	X	X	4
6120	PEARL PUBLIC SCHOOL DI	X	X	X	X	4
6500	SMITH CO SCHOOL DIST	X	X	X	X	4
6600	STONE CO SCHOOL DIST	X	X	X	X	4
6920	SENATOBIA MUNICIPAL SC	X	X	X	X	4
7011	NORTH TIPPAH SCHOOL DI	X	X	X	X	4
7012	SOUTH TIPPAH SCHOOL DI	X	X	X	X	4
7100	TISHOMINGO CO SP MUN S	X	X	X	X	4
7300	UNION CO SCHOOL DIST	X	X	X	X	4
200	ALCORN SCHOOL DIST	X	X		X	3
220	CORINTH SCHOOL DIST		X	X	X	3
420	KOSCIUSKO SCHOOL DIST	X	X	X		3
1211	ENTERPRISE SCHOOL DIST		X	X	X	3
1700	DESOTO CO SCHOOL DIST		X	X	X	3
1821	PETAL SCHOOL DIST	X	X		X	3
2300	HANCOCK CO SCHOOL DIST	X	X		X	3
3000	JACKSON CO SCHOOL DIST	X	X		X	3
3021	OCEAN SPRINGS SCHOOL D	X	X		X	3
3400	JONES CO SCHOOL DIST		X	X	X	3
3700	LAMAR CO SCHOOL DIST	X	X		X	3
3800	LAUDERDALE CO SCHOOL	X	X	X		3
5131	UNION PUBLIC SCHOOL DI	X	X	X		3
5520	PICAYUNE SCHOOL DIST	X	X		X	3
5620	RICHTON SCHOOL DIST		X	X	X	3
5900	PRENTISS CO SCHOOL DIS		X	X	X	3
7320	NEW ALBANY PUBLIC SCHO	X	X		X	3
1000	CHOCTAW CO SCHOOL DIST		X	X		2
2100	GREENE CO SCHOOL DIST	X		X		2
2320	BAY ST LOUIS WAVELAND	X		X		2
2420	BILOXI PUBLIC SCHOOLS		X		X	2
2422	LONG BEACH SCHOOL DIST	X	X			2
2423	PASS CHRISTIAN PUBLIC		X	X		2
3600	LAFAYETTE CO SCHOOL DI		X		X	2

DISTRICT NUMBER	DISTRICT NAME	INSTRUCTION	ADMIN.	M&O	ANCILLARY	TOTAL SELECTIONS
3711	LUMBERTON PUBLIC SCHOO		X	X		2
4120	TUPELO PUBLIC SCHOOL D		X	X		2
4821	AMORY SCHOOL DIST	X		X		2
5500	PEARL RIVER CO SCHOOL	X	X			2
2421	GULFPORT SCHOOL DIST		X			1

The new MAEP calculation determined by using the new school district selection criteria described above generated a base cost figure of $3,804 for each student with no special needs. (This figure must be updated using the most recent figures from the Mississippi Department of Education before being used in a state education formula.) The MAEP figure can be used in conjunction with the weights for special needs students to generate a total cost figure for each district. The section that follows describes how the adjustments for special needs students were developed, what the adjustments are and how they were determined.

Adjustments for Special Needs Students

At the outset of the project, it was determined that updating the fiscal adjustment for at-risk students was critical in helping Mississippi students meet state academic standards. Further, it was recognized that converting categorical program funding – in the cases of special education, gifted education and vocational education – to adjustments to the base cost could significantly increase the equity of the Mississippi school funding system. Because the "successful school district" approach is not designed to produce cost figures for special student needs areas, a modified version of the "professional judgement" approach was used to determine the adjustments for these four groups of students.

The primary purpose of the professional judgement approach is to estimate the cost of providing those services believed to be necessary to assure that all students can meet all of the objectives a state has established for public education. This is typically done by determining a base cost figure (the cost to assure that a student with no special needs, attending school in an average school district, can meet those objectives) and a series of adjustments, expressed as pupil weights, which specify the added costs of both serving students with special needs.

In the case of this study, we took the estimate of the base cost figure derived for the MAEP update using the "successful school district" approach and used the "professional judgement" approach to estimate the pupil weights associated with the cost of serving students in special education, students at risk of academic failure (using the number of students eligible for free lunch as a proxy for the number of students who require added support to meet state performance expectations), students in career-technical education and gifted students.

In its simplest form, the professional judgement approach uses panels of well-qualified people to identify the resource needs of categories of special need students. In this study

four professional judgement groups were convened – one for each category of special need students.   Once APA identified the characteristics of the individuals needed to serve on the panels (in terms of role in the school/district and level of experience with the particular category of special needs student), we asked MDE to identify specific people to participate. Approximately thirty people attended the four panel meetings the first week of December, 2003, in Jackson. At each meeting, participants were given a set of instructions to guide their work. Each panel worked with an APA staff team (John Augenblick, Bob Palaich, Justin Silverstein and Todd Ziebarth fulfilled this role). The panels specified the resource needed to serve the four different categories of special need students. An APA staff member recorded the consensus of the group into the data gathering tools that APA supplied.

Following the panel meetings, APA summarized the work of the panels and created the weights for each special needs category. The primary prices needed to cost out the resources specified were the salaries and benefits of personnel and the prices assigned to different kinds of technology equipment. For personnel salaries, we used statewide average figures. It is worth noting that the panels discussed resources, primarily in terms of personnel, and did not know the cost of the resources being discussed. Also, at the time the panels met, no one from APA who facilitated the work of the panels knew the cost of the resources. The implication of these conditions is that no one was in position to manipulate the outcome to produce a particular dollar result.

Regardless of the level at which the base cost figure (MAEP calculation) is set, the professional judgement approach provides information about how to adjust a base cost figure in a school finance formula to reflect different student needs. For example, the figures in Table 2 suggest that a system of pupil "weights" could be developed to specify the cost of special services for students with special needs. Student weights are used when the proportion of students with a special need varies across school districts and when there is an added cost, above the base cost, to serve such students. Weights are used to modify the count of students so that the modified count reflects the relative cost. For example, if the added cost of serving students with a particular need is 20 percent greater than the base cost and the proportion of students with that need varies across all districts, students with that need would be counted as 1.20 students – when the weight is multiplied by the base cost the total reflects the full cost of serving the student. Using this approach, 1.00 represents the base cost of providing service (the new MAEP base of $3,804) and .20 represents the *added* cost for the particular need.

Student weights can be as simple or as complex as data and policy permit. For example, student weights are often used in special education. In some states, multiple weights are used for special education with each weight designed to reflect the relative cost of providing services to students with particular disabilities or based on the levels of service, each of different cost, individual students receive (of course, this approach requires information about the relative cost of different levels of special education). Because of the possibility of mis-classifying students when multiple weights are used for special education, some policy makers advocate the use of a single weight for special education,

assuming that the distribution of students with varying levels of special education needs is, or should be, similar across school districts.[1]

Special Education Weight in Mississippi

In Mississippi, given the recently adopted matrix system for generating special education funding, it would be possible to generate up to 12 different student weights for special education. For the purpose of this summary memo, we will discuss only a single student weight for special education. If policymakers in a later stage of deliberations need to consider establishing multiple categories of weights in special education, APA can create a report on two additional options for applying special education student weights given the state matrix – special education student weights for each treatment category and special education student weights for each level of treatment (measured in hours).

Table 2: Derived Special Need Student Weights
for At-risk, Special Education, Career-Technical and Gifted Students

BASE COST AND ADJUSTMENTS	BASE COST	WEIGHTS	ADDED AMOUNTS
NEW MAEP BASE COST	$3,804		
Special Education		2.07	$7,874
At-risk		1.14	$4,337
Career-Technical: 7th & 8th		0.13	$ 495
Career-Technical: 9th & 12th		0.37	$1,407
Gifted		0.48	$1,260

In the case of special education for Mississippi, the figures derived from the professional judgement group on special education show that the *added* costs for a single student weight for all categories of special education students is 1.88 without including pre-school and 2.07 including preschool. We would suggest using the weight that includes the mandatory special education pre-school.

The special education student weight of 2.07 is higher that what we have found in other states. A preliminary analysis of the dollar amount estimated for providing special education services, however, is close to the estimates developed in other states. The student weight appears higher because the base cost figure for Mississippi (the MAEP base cost calculation) is relatively low. The national figure for the added cost of all special education students calculated by the National Center on Special Education

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1   Some people have advocated the use of the "census-based" approach to deal with special education costs. Under this approach, an assumption is made that every district has, or should have, the same total proportion of special education students. Once this assumption is made, the cost of special education can be included in the base cost figure since the proportion of students with special needs would not vary across districts.

Finance ranges between .90 and 1.09. It should be noted that the use of the single special education student weight assumes the policy decision that all students in special education are treated in the same way regardless of disability; this approach may make sense for all students other than those few students with extraordinary high needs, who probably should be funded directly by the state given that even a single such student could have an enormous fiscal impact in a smaller school district.

At-risk Weight in Mississippi

In the case of at-risk students, the figure derived from the professional judgement group showed that the *added* cost for an at-risk student is 1.14. The magnitude of this figure is higher than what other states have used to provide added support for at-risk students although it is based on the count of students eligible for free lunch in Mississippi while the count in other states may include those students eligible for free and reduced price lunch. A preliminary analysis of the dollar amount estimated for providing services for at-risk students is again close to the estimates developed in other states. The student weight therefore appears higher because the base cost figure for Mississippi (the MAEP base cost calculation) is relatively low.

Career-Technical Weight in Mississippi

In the case of career-technical students, the figure derived from the professional judgement group showed that the *added* cost for career-technical students are divided into two distinct groups, the added cost for a 7th and 8th grade student is 0.13 and the added cost for a 9th through 12th grade student is 0.37. These estimated weights do not include the cost of equipment at either level. In Mississippi, virtually every 7th and 8th grade student rotates through a career education course. The percentage of students participating in career-technical education at the high school level is approximately 30 percent. No directly comparable weights for career-technical students are available from other states.

Gifted Weight in Mississippi

Finally, for gifted students, the figure derived from the professional judgement group shows that the *added* cost for a gifted and talented student is 0.48. The gifted and talents professional judgement group suggested that the count of these students in high school be limited to those students involved in gifted programming and not include those otherwise identified as gifted. To use a gifted and talented student weight in a funding formula, the state would need to enforce an agreement as to the definition of gifted and talented. The greatest difficulty associated with the incorporation of a gifted and talented weight is the enforcement of a uniform system of identifying gifted and talented students. No directly comparable weights for gifted and talented students are available from other states due to the inconsistency in definition and the counting of students.

Integrating Adjustments in the New MAEP Calculation

All of these weights could be combined to estimate the revenue needs of every school district in Mississippi, which in turn could be used to operate a foundation program of the sort that Mississippi uses to distribute state aid (see formula to determine district cost below). The use of weights would allow all costs to be organized into a single formula rather than operating separate formulas for at-risk, special education, career-technical and gifted as is done now (there is an at-risk student adjustment in the current formula). While the result of this effort would be to specify the revenue needs of every school district such knowledge does not speak to the issue of where needed revenue would come from. Nothing in our analysis specifies how much revenue should come from local or state sources.

Finally, it is worth commenting on one other issue that arises in using results from the successful school districts and professional judgement approaches. Despite the fact that the base cost figure and the new student weights are based on a set of very specific set of resources, it would not be appropriate to require school districts, or schools, to spend the money directly in accordance with the average amount of resources identified in the successful school districts or in the professional judgement panels for special needs students. There are at least two reasons why this is the case.

- First, it is consistent with the theory that underlies the whole concept of the state determining an adequate level of resources. Under that theory, the state's role is to establish performance expectations, measure how well schools and districts are doing, assure that they have adequate resources, give them wide flexibility in how they spend those resources, and hold them accountable for meeting state expectations. In a sense, if the state required schools and districts to spend funds in a specific way, the state could only hold them accountable for doing so, not for the performance of students.

- Second, it is unlikely that any individual school would have the same size and the same demographic characteristics as either the schools in the successful school districts or the prototype schools used in the professional judgement groups. Requiring other schools to deploy resources in the exact same manner would imply that a "one size fits all" for both communities and schools. In education, we know this is not the case.