



Augenblick, Palaich
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Estimating the Cost of an Adequate Education in Minnesota

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INTRODUCTION

This report was prepared by Augenblick, Palaich and Associates, Inc. (APA), a Denver-based consulting firm that has worked with state policy makers on school funding issues for more than 20 years. Over this time, the firm has evaluated school finance systems in more than 20 states and helped create the school finance systems in Colorado, Kansas, Louisiana, Maryland, Mississippi, New Hampshire, Ohio, and South Dakota.

The report was prepared at the request of P.S. Minnesota and follows up work to review a 2004 adequacy study undertaken by Management, Analysis and Planning (MAP) for the School Funding Task Force. P.S. Minnesota asked APA to use the MAP work and to add additional analysis to create a new adequacy study for Minnesota.

The purpose of this report is to estimate the cost of an “adequate” education in Minnesota. As used here, “adequacy” means the cost of meeting state and federal resource requirement and student performance expectations, including those in Minnesota’s education accountability system and the state’s federally-approved plan to comply with the No Child Left Behind Act (NCLB). By defining the cost of adequacy, this report can help school districts, taxpayers, and policy makers understand the revenues schools need to produce the student results that are expected of them. To accomplish this work, APA focuses on two key costs:

- 1) A base cost, per-student (including the cost of plant operation and maintenance, but excluding costs of student transportation, food services, community services, adult education, capital costs, and debt service costs) adjusted for the size of the district; and
- 2) Additional cost “weights” for students with special needs (including “at-risk students” – those eligible for free or reduced price lunch are used as a proxy to define at-risk students – special education students, and English language learners).

APA also examines the cost impacts of district geographic location.

As discussed later in this report, APA used several sources of information and analysis to conduct its work. These include:

- The previous MAP report.
- A “successful schools” analysis.
- Elements of an “evidence based” analysis which were used to evaluate the previous MAP work.
- Elements of a “statistical approach” which were used to better understand regional cost differences and cost impacts due to district size differences.

The chapters of this report are organized as follows:

- Chapter I discusses what it means to examine the cost of an “adequate” education. It provides a background on adequacy, outlines the four main approaches used to conduct adequacy studies, and describes the experiences of three states that have used such studies in the past.
- Chapter II describes APA’s successful school approach and the base, per-student cost figures it produced.
- Chapter III describes previous professional judgment approach work conducted by MAP and how APA used evidence based analyses to examine the MAP results.
- Chapter IV describes the statistical analyses APA conducted to create base cost and funding formula adjustment factors. These statistical analyses address the impact of: 1) Cost of living; 2) district remoteness; and 3) district size differences.
- Chapter V discusses how the figures can be used to estimate the cost of adequacy for Minnesota school districts.
- Chapter VI compares the adequacy figures with current Minnesota district expenditures.
- Chapter VII discusses issues that need to be taken into account when a formula is created that have not been fully addressed in this report.

I. WHAT DOES “ADEQUACY” MEAN?

For purposes of this report “adequate revenues,” or “adequacy,” mean: sufficient funding so that schools and districts have a reasonable chance to meet state and federal student performance expectations. Such performance expectations are reflected in Minnesota’s state education accountability system, the state’s federally-approved plan to comply with the federal No Child Left Behind Act (NCLB), and other requirements.

There are two primary reasons to determine the cost of adequacy:

- (1) To understand the cost implications associated with meeting state and federal requirements/expectations; and
- (2) To estimate needed adjustments to existing state school finance formulas.

With regard to meeting state and federal requirements, the fact is that most states (including Minnesota) and the federal government have decided that standards-based reform is the best way to improve the elementary and secondary education system in this country. Under standards-based reform, the role of the state is to: (1) set standards for students, teachers, schools, and/or school districts (in terms of both “inputs,” such as teacher qualifications, course offerings, or service requirements, and “outcomes”, such as attendance and student performance on achievement tests); (2) measure how well students, teachers, schools, and/or school districts are doing in meeting the standards; and (3) hold students, teachers, schools, and/or school districts accountable for their performance.

At the outset of the standards-based reform movement, starting with the reform of the Kentucky education system in 1990, most states and the federal government did not attempt to estimate the costs that every school or district would incur in order to meet state/federal performance standards. Determining such costs has therefore become an essential missing piece that state policy makers need in order to understand what resources are required for schools and districts to succeed. Once these costs are determined, state policy makers also need to be able to properly incorporate them into the state’s school finance system.

Many states use a “foundation-type” formula as the basis for allocating a majority of the state’s aid to school districts. Under a foundation approach, the state typically determines a “target” amount of revenue per student (combining a fixed, base amount – the foundation level – with added amounts for students with special needs). Districts are required to make a state-calculated amount of local tax effort to help meet the foundation level. In most states, that amount is based primarily on property wealth. Due to differences in property values, however, the same local tax effort can raise varying amounts of funds from district to district. To help level the playing field between wealthy and poor districts, the state makes up the difference between the amount of revenue generated by the property tax and the amount guaranteed as the foundation target.

Minnesota's current school finance formula is called a general education revenue program. It differs from the traditional foundation formula by using full state funding of twelve revenue components for general education without a local property. The Formula Allowance that served as the base cost in the old foundation formula is still used as the basic revenue component in the new formula.

In some states the foundation level is calculated based on the amount of revenue needed for a student with no special needs attending school in an average size school district. In other states, student weights are used to help reflect the added cost of serving students with special, high cost needs. Weights can also be used to reflect the added cost of providing services in districts that face uncontrollable cost pressures – often related to a district's size or regional cost differences. In many states – including Minnesota – however, the determination of the foundation level (i.e. the Formula Allowance and revenue components) does not take into account the state (and federal) expectations for district and school performance. Such a method for determining the foundation does not reflect the level of resources needed to fully implement standards-based reform.

Approaches to Estimating the Cost of Adequacy

In the past few years, states have begun to develop approaches that can calculate a cost that reflects a particular level of desired student performance. These efforts are designed to create a base cost that has meaning beyond simply reflecting available state revenue. Researchers have identified four approaches to determine such a base cost:

- (1) The successful school approach;
- (2) The professional judgment approach;
- (3) The evidence-based approach; and
- (4) The statistical approach.

Each of these methodologies has strengths and weaknesses. They differ in their underlying philosophies, the amounts of information they require, the types of information they produce, the number of states in which they have been used, and the magnitude of the parameters that they estimate.

APA has come to believe that the successful school approach provides a reasonable estimate of the base cost in relation to what school districts are accomplishing at present. Under this approach the base cost is determined by examining the spending of districts that meet current state standards. The base cost applies to students with no special needs attending schools in districts that do not face unusual cost pressures.

We have found that the professional judgment approach provides a reasonable estimate of the base cost for a level of performance expected in the future. It also provides information about the additional costs of serving students with special needs or of serving students in districts that vary in size. The approach

relies on the knowledge of experienced educators and education service providers to specify the resources needed for schools and districts to achieve a set of specified performance objectives. Once the resources are specified (with a focus on numbers of personnel, regular school programs, extended-day and extended-year programs, professional development, and technology), costs are attached and a per pupil cost is determined.

APA has found that the statistical approach – which is based on understanding those factors that statistically explain differences in spending across school districts while controlling for student performance – cannot be used effectively in many states due to a lack of available information. In particular, there is often a lack of needed fiscal data at the school level. We have found the evidence-based approach – which seeks to use information gleaned from research to define the resource needs of a hypothetical school district – to also be limited in its usefulness. This limited usefulness is driven by the limited findings that current education research offers. For instance, existing research speaks only to limited kinds of resources, primarily teachers and some of the staff who support them – and studies even in these areas can offer conflicting or unclear results. In addition, research often says nothing about many critical resources that schools utilize such as librarians, counselors, plant operation and maintenance, and school district administration.

With this in mind APA decided that a Successful School Districts (SSD) approach needed to be added to the current MAP Professional Judgment (PJ) work. We also determined that use of the Evidence Based (EB) approach would allow APA an opportunity to validate the MAP work. Finally, APA used aspects of the Statistical approach to examine differences in costs due to location, the cost of remoteness and differences in costs due to district size.

How Adequacy Studies Are Used: Case Studies in Three States

This section describes the experience of three states (Kansas, Maryland, and Mississippi) that have conducted studies designed to understand the cost of an adequate education. Each state's unique context and circumstances result in different stories for how the adequacy studies are used and implemented by policymakers.

Kansas

Kansas is an interesting example of the interaction between a state's constitution, its legislature, and its courts in terms of education adequacy. The Kansas constitution requires that the "legislature shall make suitable provision for finance of the educational interests of the state." In 1994, the Kansas Supreme Court upheld the recently enacted school finance system (the School District Finance and Quality Performance Act). In 2002 APA released its study, which was commissioned by the state Legislature. The study estimated the factors that could be used to estimate the cost of a "suitable" education. APA, however, never used the factors to make a district by district estimate of such costs. Instead, the State, through the state Department of Education, did its own

analysis and determined that the cost was \$726 million over the \$1.95 billion that was being spent in school districts at that time.

In 2003, a state district court declared the school finance system to be unconstitutional and gave the legislature until the end of the 2004 session to fund the system at an appropriate level. The legislature did not modify funding that year and in 2005 the Kansas Supreme Court found the school finance system to be in violation of the state constitution cited above.

During the 2005 legislative session, the legislature developed a plan to increase education funding by \$141 million and to do so by phasing-in new funds over time. The Kansas Supreme Court required the legislature to add \$143 million to the \$141 million already provided, and this was accomplished before the 2005-06 school year began. During the 2005 session the legislature also required that the Legislative Division of Post Audit (LDPA) conduct an independent study of the costs of a suitable education. A driving factor behind the legislature's request for the LDPA study was a statement made by the Supreme Court that the only information it had to guide its thinking about cost was the 2002 APA study.

The study by the LDPA was released in 2006 and recommended total spending that was consistent with the state's interpretation of the APA study. In 2006, the legislature added additional funding for education and established a plan to phase in additional funding over the next eight years. The Kansas Supreme Court reviewed the legislature's work and ruled that the school finance system is in compliance with the state constitution.

Maryland

Maryland is an example of a state taking the lead in identifying and providing the adequate cost of education. In 1999, Maryland established the Commission on Education Finance, Equity, and Excellence (Thornton Commission). The Thornton Commission first examined the overall structure of the state's school finance system and then began to examine the adequacy of the system. One of the big reasons the commission turned to adequacy was Maryland's strong accountability system and the commission's belief that districts needed to be assured of having the resources necessary to meet the standards.

The Thornton Commission relied on APA, then Augenblick & Myers, to conduct both the Successful Schools and Professional Judgment approaches. The approaches created two base costs and a number of adjustments for students with special needs. The Thornton Commission's final report suggested using the Successful Schools base number as a starting point with district's having the ability to get to the Professional Judgment base. The adjustments for students with special needs were also adjusted to be in line with the number of students who would fall into more than one category.

The legislature enacted Thornton Commission's recommendations in 2002. There was a six year phase in of a \$1.1 billion dollar increase in funding for schools. The phase-in continues today and is nearing full implementation.

Mississippi

Mississippi is an example of a state that has used the successful school (in this case focusing on districts) approach as the basis for developing the base cost figure it uses in its school finance system (the Mississippi Adequate Education Program, or MAEP). MAEP was adopted in 1996, replacing a system that had been based on numbers of personnel and a statewide teacher salary schedule. Both MAEP and its predecessor are foundation-type systems, which require the state to specify the revenue needs of each school district.

At the time MAEP was enacted, the legislature was looking for a way to determine how much school districts needed to spend in order to meet state school district accreditation requirements. The MAEP base, developed by APA, is therefore composed of four accreditation components – instruction, administration, plant operation and maintenance (M&O), and ancillary (primarily student and staff support). APA created a procedure to identify districts that were “successful” in terms of meeting specific criteria associated with each component. First school districts that met the highest level of school district accreditation were selected. Then, within each component, efficiency criteria were specified to identify districts that had personnel ratios that were not too far from the statewide average. So, for example, with instruction, the per student expenditure figures of districts that both met accreditation standards at the highest level and did not have unusually low student-teacher ratios were used to create a statewide average figure for instruction. Figures for the other components were combined with instruction to create a base cost.

In 2005 APA was asked to help the legislature update the figures in light of student performance information (which had not been available earlier) and new efficiency criteria. The legislature adopted the new procedure in 2006 and student performance criteria now play a central role in the state’s accreditation standards. It should be noted that the legislature has not made changes in the ways it provides support for students with special needs, some of which are based on student weights. Additional analysis, using an approach other than the successful school approach would be required to make such adjustments.

II. SUCCESSFUL SCHOOL DISTRICT APPROACH

The Successful School District (SSD) approach seeks to identify districts that meet current and/or future performance standards. The base spending of these “successful” districts – meaning only that spending which is related to serving students with no special needs – is then examined. One should be careful to note that, while these districts are labeled “successful,” it is not necessarily accurate to refer to other districts in the state as unsuccessful. Other districts may, in fact, be making significant positive strides with student performance even though they do not meet the current or future performance standard used under the SSD analysis.

Using the Successful School District Approach in Minnesota

In order to undertake the SSD approach, APA needed spending data for each school district in the state. The spending data had to be organized in such a manner that APA could examine only the base spending for each school. Base spending excludes spending for special education, at-risk students, English language learners, food service, transportation and capital. APA worked with the Minnesota Department of Education to collect this data.

APA also decided to include a number of efficiency screens as part of the SSD work. These screens exclude successful schools from the analysis if they are found to be inefficient or lacking data in their spending. APA developed screens for instructional spending, administrative spending and building maintenance and operations spending.

Selecting Successful School Districts

When selecting districts for the SSD approach APA set criteria to identify districts in Minnesota that were on their way to meeting the future standards set by the state. That is to say that the criteria were not designed to simply identify districts that were doing better than other districts on today’s tests but were actually showing the type of performance or improvement necessary to meet the state’s higher future standards. APA also wanted the criteria to measure success with a broad range of students, not just success with the average student. Minnesota’s testing systems allow the criteria to be designed this way because the tests break out performance results for different types of students.

To meet the objectives for selection described above, APA used a combination of two main criteria. The first focused on the Minnesota No Child Left Behind (NCLB) standards for the 2008-09 school year. APA set the Adequate Yearly Progress (AYP) objectives for that year as the first criteria. This standard differed by grade level as seen in the following table.

Minnesota	Elementary		Middle School		High School	
AYP Objectives,	<i>ELA</i>	<i>Math</i>	<i>ELA</i>	<i>Math</i>	<i>ELA</i>	<i>Math</i>
2008-2009	52%	56%	58%	55%	82%	62%

APA used performance data from the 2002-03, 2003-04 and 2004-05 school years to see if the district's performance trend was on target to meet the 2008-09 objectives. We did this by regressing the proportion of students making AYP against time for each district and using the resulting formula to predict 2008-09 performance. If a district was on target to meet the 2008-09 objectives they were deemed successful.

The second criteria focused on how well the districts were doing with their special need populations with regard to the state's 2004-05 AYP goals. The populations APA focused on were special education, at-risk pupils and English language learners. We examined 2004-05 reading and math test performance for each of these three populations, which gave us six tests to examine for each district. The 2004-05 AYP reading and math goals are shown in the following table.

Minnesota	Elementary		Middle School		High School	
AYP Objectives,	<i>ELA</i>	<i>Math</i>	<i>ELA</i>	<i>Math</i>	<i>ELA</i>	<i>Math</i>
2004-2005	40%	45%	48%	43%	78%	52%

To be considered successful, a district had to meet the first criteria (based on the 2008-09 AYP goals) and at least two of the six special population tests had to meet the 2004-05 performance objectives. Using both criteria in this fashion, 45 districts were found to be successful. The list of these successful districts is found in Appendix A-1.

Identifying Spending

The next step in the SSD approach is to identify the base spending amount for each successful school. As mentioned earlier, APA worked with the Minnesota Department of Education to collect 2003-04 spending data for each district. We collected some data from the Department's website and received other data directly from staff. A base cost figure was then identified for each district. This base figure excludes spending for at-risk students, special education students, ELL students, transportation, food service and capital.

Efficiency

Once APA identified the base spending for each district, we looked to apply efficiency screens for each of three spending areas: Instruction, Administration and Building Maintenance and Operations. The table below show which types of activities are associated with each of the three spending areas.

Instruction

Regular Instruction
Instructional
Support
Pupil Support Services

Administration

District and School
Administration
District Support Services

**Building Operations and
Maintenance**

Operations and Maintenance

The efficiency screens are designed to simply exclude those districts whose spending in any one of the areas is out of line with the other districts. This efficiency is measured in two ways, for instruction and administration APA examined the number of personnel per 1,000 weighted students in the category. For buildings operations and maintenance, personnel data was not available and spending per pupil was used for the efficiency screen.

The personnel data for instruction and administration was collected from the department of education. For instruction APA examined the number of teachers per 1,000 weighted pupils in each school. APA used weighted students in the calculation so that a district with a high number of students with special needs would not be punished for having more teachers for this harder to serve population. The weights we applied come from the PJ work that will be discussed in the following chapter. The weights reflect the APA work done using the Management Analysis and Planning professional judgment work undertaken for the state. We then excluded any district with a teachers-per-1,000-weighted-pupils figure that was one standard deviation above the mean or higher. The administration efficiency screen relied on the number of administrators per 1,000 weighted pupils and again excluded those districts with a figure above one standard deviation above the mean. Finally, for building maintenance and operations APA excluded any district whose spending per pupil in the category was one standard deviation above the mean or higher.

The list of successful districts that passed each efficiency screen can be seen in Appendices A-2 through A-4.

Base Spending

Once the efficiency screens were applied, APA was left with 38 districts for instruction, 39 districts for administration and 43 districts for building maintenance and operations. We examined the per pupil spending for each of these districts in the three different categories and came up with base costs for each area: 1) Instruction weighted average base cost is \$3,926; 2) Administration weighted average base cost is \$663; and 3) Building maintenance and operations weighted average base cost is \$609. This creates a total SSD base

cost of \$5,198 in 2003-04 dollars. When inflated to the 2004-05 year, using the Minneapolis- St. Paul CPI the base cost is \$5,359.

III. PROFESSIONAL JUDGMENT & EVIDENCE BASED APPROACHES

The professional judgment (PJ) approach relies on the assumption that experienced educators can specify the resources hypothetical schools need in order to meet state standards and that the costs of such resources can be determined based on a set of prices specific to those resources. Identified resources are typically divided into two groups:

- (1) Those associated with a “base cost” that applies to all students; and
- (2) Those associated with students who have special needs.

For example, thinking about the base cost, a PJ panel of experienced educators might find that, for a hypothetical school with 200 students, ten teachers would be needed so that students can meet state academic standards. If the statewide average salary and benefits of a teacher were \$40,000, then the cost per student based on the professional judgment panel’s input would be \$2,000 (10 teachers times \$40,000/teacher divided by 200 students). Based on the panel’s judgments, other costs might also need to be incurred such as those associated with teacher aides, school principals, supplies and materials, and so on. Together, these costs could be added to determine the total “base” cost of providing an adequate education.

In Minnesota, Management, Planning and Associates (MAP) previously undertook a PJ approach for the School Funding Task Force. The results of this work were presented in a July 2004 report. MAP’s work used a number of PJ panels which examined hypothetical schools with different mixes of special need students. This work, however, did not yield two key pieces of information: (1) it did not specifically identify a “base cost” that applies to all students; and (2) it did not identify the additional resources needed for students with special needs.

In late 2005, APA attempted to use the MAP findings to generate both a base cost and adjustments for students with special needs. APA’s work in this regard yielded a report (which can be found in Appendix E). Our report used analyses of the MAP data to identify: 1) A base cost of \$5,558 per student (in 2001-02 dollars); and 2) Special need student weights of 1.90 for special education, .75 for at-risk students, and .90 for LEP students.

It is important to note that APA does not necessarily endorse the MAP approach, and that we did not do any independent work to validate the process which MAP used. We are however, able to examine the resources identified by the MAP panels and can compare these findings with the types of resources generated by the Evidence-Based (EB) approach to examining adequacy. This comparison can shed light on whether MAP’s PJ panel work was reasonable, which in turn helps indicate if the above base cost and student weight figures from the 2005 APA report are reasonable as well.

In a number of states, the evidence-based approach has been used to fully cost out an adequate education. APA does not believe the EB approach is

appropriate for this purpose because it treats all state accountability systems and performance standards the same, and therefore is only capable of producing generic, one-size-fits-all recommendations. For the more limited purpose of comparing results with MAP’s panel findings, however, we believe EB findings can be useful. To make this comparison, APA relied on EB work previously conducted in Arkansas, Arizona, and Kentucky.¹

The evidence-based figures are not calculated for all sizes of schools, but instead only for schools of 500. To account for the fact that evidence-based figures were only calculated for one size of school, APA adjusted the figures in relation to the size ratio of the MAP panels’ hypothetical schools. For example, the evidence-based research resource model shows 29 teachers needed for an elementary school of 500. If a panel looked at an elementary school of 300, the research-based figure would be 17.4 teachers. Similarly, if the panel was working with an elementary school of 700 the research-based figure would be increased to 40.6 teachers. The table below shows the general EB figures.

Evidence-based Resource Model			
500 Total Pupils in Each School			
	Elementary	Middle	High
Personnel			
Classroom Teachers	29	20	20
Other Teachers	6	4	4
Counselors	1	1	1
Principal	1	1	1
Assistant Principal	0	0.5	0.5
Instructional Facilitators	2.5	2.5	2.5
Teacher Tutor	1	1	1

The next step was to compare the MAP findings with these EB figures. To do this, APA examined the layout for the “Red Team” from page 52 of the Task Force Report. The report laid out the resources identified by the team for five different 372-student elementary schools. The only difference in the schools were the percent of at-risk and LEP students. APA focused on the resources for “regular” students for the EB comparison. These resources did not change in the five different schools. APA focused on the classroom teachers, “other” teachers, kindergarten teachers and principals for both the PJ and EB work. The table below compares the resources.

¹ See, for example: “A State-of-the-Art Approach to School Finance in Kentucky,” Odden, Fermanich and Picus, (February 2003) for the Kentucky Department of Education.

**COMPARISON OF MAP PJ FIGURES TO EVIDENCE BASED
FIGURES FOR SELECTED PERSONNEL CATEGORIES.**

	<u>MAP PJ Work</u>	<u>Evidence-Based</u>
Classroom Teachers	17.50	17.36
Other Teachers	5.00	4.46
Kindergarten Teachers	4.50	4.13
Principals	1.00	0.74

In the end, the resource levels were quite similar and it appears that the MAP panel work was in line with the research-based figures from the EB approach. This finding gives APA added confidence in continuing to use (with one exception) the figures derived from our first report (shown in Appendix E). The exception is that the Special Education weight needed to be revisited. In fact, after additional analysis, APA found the original special education weight of 1.9 was out of line with national research in the area and with results from numerous APA professional judgment studies in other states. Based on these findings, APA identified a more appropriate weight of 1.0 for each special education student. This change results in the following base cost and added weights:

- 1) Base cost of \$5,938, in 2004-05 dollars using the Minneapolis-St. Paul CPI to adjust the original figure.
- 2) Special Education weight of 1.0
- 3) At-Risk weight of .75
- 4) LEP weight of .90.

IV. STATISTICAL ANALYSES: LOCATION COST METRIC, REMOTENESS AND DISTRICT SIZE ADJUSTMENT

APA used a series of statistical analyses to strengthen our work. These analyses examine three factors:

1. Location Cost Metric
2. Impact of Remoteness
3. District Size Adjustment

Location Cost Metric

In this section, APA analyzes adjustment factors which can be included in Minnesota's education funding formula that take into account geographic cost of living differences across school districts. The purpose of this analysis is to help identify if cost of living differences impact the cost of delivering education services in different areas of the state.

The rationale for such an analysis is well established. In fact, it is now widely recognized that cost of living differences can have a significant impact on the ability of school districts to provide equivalent education services. This is especially true with regard to labor. To retain teachers and other employees, school districts must be able to offer compensation that is competitive with other employers, and employee compensation must be sufficient to purchase goods at local prices.

To help quantify cost of living differences, APA has created a "Location Cost Metric" (LCM). This is a factor that can be included in Minnesota's school funding formula to adjust the amount of state aid districts receive. The LCM reflects both the cost of living and the cost of hiring and retaining personnel. For the labor market, the index reflects both the county-level labor market and, to a lesser degree, the broader market of the economic development region. Within the Twin Cities metropolitan area, distinctions are made among counties based on housing costs and their share of a household budget.

For wages, the choice is between using average wages and comparable wages. Comparable wage data compares the wages for the same occupations across districts. The average wage indicates the collective purchasing power in an area. The standard underlying comparable wage is that if plumbers and lawyers are paid more or less in an area, so should school personnel. The standard underlying average wage is that if teachers are competing with other consumers who earn more or less than those in other areas, then their wages should be scaled to those of other consumers. Because locally determined prices mainly mean housing, the average wage better reflects the reality of what a salary must be able to purchase in order to retain personnel. From this point of view, most districts outside the twin cities area do not need a housing cost adjustment because average wages determine housing cost. The average wage by itself can provide an adequate metric outside of the state's primary metropolitan area.

The LCM was created using average weekly wage data for all industries, made available by Minnesota's Department of Employment and Economic Development (DEED), at <http://www.deed.state.mn.us/lmi/tools/qcew.htm>. For each county school district and for each economic development region, the wages for the most recent available three years (2002-2004) are regressed against year, and the resulting coefficients are used to project the results for the most recent year (2004). The regression has the effect of averaging three years data to smooth out minor fluctuations and also has the effect of being weighted toward the most recent information.

Each district is weighted at 80 percent for its county wages (where personnel work and perhaps live) and 20 percent for its economic region wages. The economic region is considered as the broad labor pool from which a district might compete to hire employees. The resulting composite wage index is divided by the index for the state average wage, so districts, weighted by workers, average 100 percent.² In the table in Appendix B, the wage cost index is in the second column and ranges from .68 for Big Stone to 1.10 for Carver.

In addition to average wages, the LCM reflects housing cost differences in the twin cities metropolitan area. Effectively, we treat the twin cities area as a single labor market with differentiated housing markets. This makes the most sense if, in the long run, school personnel will take jobs anywhere in the area but try to find housing relatively nearby to where they work.

In the metropolitan area, the Regional Multiple Listing Service of Minnesota collects data on median home sales price for a 13-county area, including St. Croix in Wisconsin³. We use the data for the 2005 year. Indices for the districts in the twelve Minnesota counties are adjusted to reflect variations in housing costs within the metropolitan area. District housing costs are measured by the ratio between the county's median home price and the metro area median home price. The table below shows the housing prices by county and their relation to the area average. We have included the mean as well as the median for comparison, but the median figures are the ones used in the LCM (see column three of the table in Appendix B).

² The core formula used here was originally developed for the Association of Metropolitan School Districts by students at the Hubert H. Humphrey Institute of Public Affairs. It was based in part on formulae used in other states. APA has adjusted the core formula by using regression to smooth the wage data and adding a housing component. AMSD now uses a broader approach to cost adjustments based around large regions.

³ For housing costs, the current sales price somewhat overstates the cost of housing. Most school personnel who own a home purchased it at an earlier time. Their costs are set at the time of purchase. No one updates the current housing stock for the simple cost of living, though assessment often lags current value in a way that reflects earlier prices. Assessment has the added advantage of being based on the entire housing stock, rather than the smaller share that changes hands in a year. However, because the state is indexed to 100 percent statewide, with the index only comparing one place and another, rather than absolute costs, the use of sales price rather than assessed value would not normally have much effect on the results. The exception would be in times of rapid changes in the type of housing in one location and not another, so that the high change area had high new home purchase and rental costs, while established residents would have less commodious and cheaper dwellings.

2005 Housing	Median		Average	
13-county	228,900	100%	274,714	100%
Anoka	224,000	98%	249,796	91%
Carver	256,000	112%	310,993	113%
Chisago	225,000	98%	245,999	90%
Dakota	232,000	101%	259,444	94%
Goodhue	170,000	74%	198,294	72%
Hennepin	233,000	102%	296,796	108%
Ramsey	213,000	93%	242,779	88%
Rice	210,000	92%	232,541	85%
Scott	249,900	109%	297,890	108%
Sherburne	216,350	95%		
St. Croix	199,900	87%		
Washington	252,000	110%	297,527	108%
Wright	215,000	94%	240,942	88%

Within the Twin Cities metropolitan area, wage and housing cost indices are combined. The cost index is multiplied by .65 plus .35 times the housing index, where .35 is estimated to be the share of living expenses that co-vary with housing costs. The housing adjustment affects only metropolitan districts, with the index for other districts unchanged by the housing adjustment. The cost of living index (column four in the table in Appendix B) reflects the personnel-related costs of wages and housing.

Of all district costs, 80 percent are estimated to be related to personnel, and the costs unrelated to personnel are expected to be relatively equal across regions, so the LCM is 20% + 80% of the personnel cost of living index. The final column of the county LCM table shows this final index. It varies from 1.12 in Hennepin to .75 in Big Stone, Lincoln, and Lac Qui Parle.

An example of how the LCM can be applied in Minnesota's school funding formula is shown in Chapter VI below.

Remoteness

APA undertook an analysis to examine the impact of district remoteness on the costs for districts in the state. To measure remoteness for Minnesota school districts, APA combined two elements:

1. Internal remoteness and
2. External remoteness.

We measure internal remoteness using cost of transportation per ADM. This combines the geographic spread measured by the isolation index with the

sparsity of population per square mile. If there is concern that transportation cost might be too much under the control of districts for it to be used as an index, a substitute measure of internal remoteness might be population per square mile in the school district.

The measure of external remoteness is the automobile mileage to St. Paul. This has two advantages, simplicity and reflection of the fact that the Twin Cities offer a fuller range of services and opportunities – for professional development, for instance – than any other location. Alternative measures might use distance to the nearest metropolitan area or city of 80,000 people.

The costs of remoteness

The direct impact of remoteness on cost is relatively small. The simple fact of being remote somewhat increases transportation costs, both in terms of moving supplies to and from the district and moving within the district. The bulk of this direct cost, however, is student transportation which is already accounted for in state funding. It is important to remember that transportation is accounted for but not necessarily adequate.

The indirect cost of remoteness, however, is more significant. The alternative to even higher transportation costs and lost transportation time is small schools and small classes. The cost of providing services – administration, teaching, maintenance – is comparatively inflexible, as the building must be there before any principal, the principal before any teachers, and the teacher before any students. The cost gains from combining classes across grades or splitting librarians among schools are partly offset by decreasing efficiency and productivity. Based on actual Minnesota expenditures the relation between 2003-2004 general fund expenditures and district enrollment is:

$$\text{District Expenditures} = \$474,623 + \$7445 \text{ per pupil} + \$0.0544 \text{ *(enrollment}^2\text{)}$$

Per pupil expenditures are U-shaped with enrollment. In other words, expenditures: 1) are high when there are lower numbers of students due to the impact of high fixed costs; 2) level off as fixed costs get divided among more students; 3) rise again at high enrollment levels. A district of 295 students therefore has the same per pupil cost as a district of 29,500, and both cost more per student than a district of 2950.

The most significant cost of remoteness occurs for what are termed opportunity costs. For instance, in a remote school district, there is a lack of opportunity to hire specialized personnel and the percentage of teachers with a master's degree tends to be low. These opportunity costs have numerous effects, the most significant of which is lower student performance.

Also due to remoteness, some districts have fewer specialized services to offer. That means that education depending on these services is less available. Consider special education services. Remoteness problems can make it difficult to hire general education teachers who also have training in special education or

for general education teachers to acquire special training once in the district. As a consequence, special education proficiency as indicated on test results is notably lower in remote locations.

In terms of direct costs, there is little sign that remote locations are under-funded. Leaving aside sparsity funding, remote locations are comparatively well-funded in dollars per students. In addition to sparsity revenue, they benefit from being low cost areas in terms of purchasing power. For instance, a teaching job is a relatively well-paid and high prestige position in most remote areas, even though teacher salary levels are lower than in more central locations. Likewise, a dollar in state funding goes further in most remote areas. Additionally, because they are low wage areas and because free and reduced lunch calculations take no account of the cost of living, a larger share of remote-area students qualify for free and reduced lunch than in other areas.

A proficiency model of education cost

To estimate whether remote areas are adequately funded, APA focuses on student results. We therefore construct a model of the funding needed to reach 100 percent proficiency by NCLB standards in 2013-2014. This model relies on analyzing current expenditures in Minnesota and current performance. The model is not designed to act as a separate adequacy study but simply to examine the costs of remoteness.

APA used the model to examine whether for the remoteness element was adequate or whether remote districts are adequately funded without it. We model the cost of achieving the overall 2013-14 target and the target for four subgroups: 1) free and reduced price lunch (FRL); 2) limited English proficiency (LEP); 3) special education (SPED); 4) and minority students. In general, we estimate the expected additional cost of making subgroup members proficient.

The first step is to create a production function for achieving 100 percent proficiency overall and for each subgroup. We model per pupil costs. For the student body overall, the measure we examine is the yearly rate of improvement in achieving proficiency, and we model the cost of achieving a 1 percent increase. For each subgroup, we model the cost of having proficient subgroup members, as a share of the student body; notice that having non-proficient subgroup members is, for this purpose, estimated to cost nothing. We examine the regression equations of types of spending across districts, looking for the most efficient spending that will produce given results. In other words, we ask the question: for each dollar spent, which spending category has the largest benefit? That variable's coefficient indicates the most efficient spending that would accomplish the target for the group. The production function estimates are indicated below.

We found that regular instruction is the most efficient spending to raise overall performance. To raise the district passing rate by 1 percent would cost an estimated \$889 per pupil. For the four subgroups, raising a member to proficiency costs at least \$1800-1900 apiece for minorities and LEP, and \$3500-3900 for FRL and SPED.

Proficiency Per Pupil	Cost Per Percent
Overall	\$ 889
	Cost Per Member
FRL	\$ 3,544
LEP	\$ 1,908
SPED	\$ 3,869
Minority	\$ 1,804

When all the costs are considered together, the cost of creating overall proficiency dwarfs the costs for any subgroup. The subgroup costs should be considered as add-ons to regular instruction for all students, over and above the cost expected for other students.

The costs of achieving the 100 percent proficiency target are the costs of the present education plus the costs of bringing non-proficient students up to proficiency. For students overall, that is the yearly cost of improvement. For subgroups, we estimate that students who are members of more than one subgroup become proficient at the cost of their most costly subgroup rate, rather than as the sum of their group rates. That is, a student who was both LEP and a minority, would be estimated to cost the LEP rate of \$1908 to achieve proficiency. A district's total costs are the sum of its present cost, its cost for achieving overall proficiency, and its costs for achieving subgroup proficiency.

To achieve 100 percent proficiency by 2014 (including proficiency for LEP, FRL, minority, and Special Education students) would cost a yearly average of \$10,756 (in 2003-04 funding dollars) per student. Districts would range from a low of \$7,031 to a high of \$23,972 per student.

A funding view of the cost of proficiency

The table below indicates how funds might be allocated to districts based on the results of the analysis. Each district, no matter how small, would receive a minimum of \$399,928 for central expenses of the district and schools. The main funds, though, are allocated on a per student basis, including amounts for students who are members of subgroups. Additionally, high school students would receive added funding. Finally, a modest cost of living adjustment is created. All these coefficients derive from current patterns of spending and the assumption of achieving proficiency by 2014.

District Cost of 2014 Proficiency	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t statistic	Sig.
(Constant)	399,928	88939	.092	4.50	0.000
Per Student	3,935	750		5.25	0.000
Per Special Education Student	3,182	1770	.030	1.80	0.073
Per Minority Student	5,686	584	.454	9.74	0.000

Percent Eligible for Free or Reduced Lunch	8,222	634	.556	12.98	0.000
Per Secondary School Student	4,321	1127	.065	3.83	0.000
Cost of Living * Number of Students	791	407	.052	1.94	0.053

This funding is equivalent to increasing four-fold the current compensatory funding while keeping most other funding largely the same, with the exception of sparsity and transportation sparsity. The focus is on funding for groups whose proficiency is most marginal and costly.

Remoteness and proficiency funding

Remoteness is notable by its absence from the formula. Remoteness is not directly a factor in funding. However, it is associated with both the results ($r=.404$) and with the formula ($r=.476$). That is, remote areas tend to receive more funding per pupil despite the absence of an overt remoteness or sparsity component. Under current funding, a district that is maximally remote receives 64 percent more funds than a minimally remote district; under the proficiency funding, a maximally remote district would receive 71 percent more funds than a minimally remote district. A similar difference between proficiency and current funding for remote districts appears when the average student, rather than the average district, is analyzed.

These allocations are based on what appears to produce results, in terms of proficiency. It does not indicate what the ratio between salaries in remote and central areas should be in terms of equity, nor how much it would cost to replicate a metropolitan education in a rural area. The focus is simply on what it would cost to produce proficiency.

The remote component of funding is indirect, as it is primarily in the current system. Remoteness is connected to lack of wealth, hence to free and reduced price lunch. The correction by cost of labor does not come close to outweighing the adjustment for FRL. Additionally, remote districts tend to be smaller in size, so the basic funding for each district reflects more funds to remote districts.

Since the cost of remoteness is largely indirect we feel that the other adjustments discussed throughout the report will address this issue. This is only true as long as the funding for transportation is adequate for each district. With this assumption the size adjustment becomes exceedingly important.

It is important to remember that the coefficients in the table above have been computed simply for a proficiency standard and do not take into account other considerations. They are not appropriate as general purpose weights for subgroups.

District Size Adjustment

APA generally relies on the professional judgment approach to examine the differences in cost due to district size. The MAP professional judgment study did not include a size adjustment as part of their work. In order to create a size adjustment APA turned to two other methods to examine the cost. First, we examined the current Minnesota spending to consider differences in costs based on size. As discussed above, the analysis of spending without taking into consideration cost of living differences for districts or spending for special needs students produced an expenditure pattern that looked like a U. The pattern shows small districts with similar spending to in very large districts, on a per pupil level. This can be shown through the following equation:

$$\text{District Expenditures} = \$474,623 + \$7445 \text{ per pupil} + \$.0544 *(\text{enrollment}^2)$$

APA reviewed a number of studies to determine if any of the work supported a U-shaped size adjustment based on basic expenditures. The studies did not support this finding. Next, APA examined current district spending attempting to account for cost of living differences and spending for special needs pupils. This analysis showed smaller districts spending much more at a base per pupil level than large districts. The results can be seen in the table below. This pattern comes closer to matching the results from outside adequacy studies.

APA was uncomfortable with simply relying on looking at current expenditure analysis to set the district size adjustment. So, APA looked to three states that had recently conducted adequacy studies and whose makeup was similar to Minnesota's. We then examined the size adjustments for each of the states – which included Colorado, Missouri, and South Dakota. All three states show smaller districts spending considerably more than larger districts on base spending before any sort of cost of living adjustment might be made

The following table shows the size adjustments based on district size and the average of the three states. The final column represents Minnesota's actual expenditures corrected for compensatory spending and regional cost of living.

**DISTRICT SIZE ADJUSTMENTS FROM ADEQUACY STUDIES IN THREE STATES AND
CURRENT MINNESOTA DATA**

District Size	Colorado	Missouri	South Dakota	Three State Average	Current Minnesota less Compensatory Spending
50	2.61	1.88	1.81	2.10	4.19
100	2.46	1.65	1.68	1.93	3.02
250	2.03	1.19	1.34	1.52	2.32
500	1.49	1.08	1.26	1.28	2.07
750	1.47	1.08	1.22	1.24	1.98
1,000	1.33	1.07	1.19	1.20	1.95
2,500	1.12	1.04	1.13	1.10	1.84
5,000	1.01	1.00	1.01	1.01	1.77
7,500	1.00	1.01	1.00	1.00	1.74
1,000	1.00	1.02	1.00	1.01	1.68
25,000	1.01	1.05	1.00	1.02	1.42
50,000	1.02	1.05	1.00	1.02	1.00

After analyzing all of the data around differences in costs based on district size, APA concluded that the adjustment we can best support based on research is the Three State average figures. This adjustment is used throughout the remainder of the report.

V. ESTIMATING THE COST OF ADEQUACY IN MINNESOTA

This chapter discusses how APA used the successful school district (SSD) and professional judgment (PJ) analyses to estimate the cost of adequacy for school districts and individual schools with various demographic characteristics.

Alternative Base Cost Figures

The SSD and PJ approaches produce data and information that is specific to successful districts with specific characteristics or to hypothetical schools. That information, however, needs to be translated so it can be applied to schools and districts with any set of demographic characteristics. For these purposes, several specific questions need to be addressed:

- (1) What do the differences in the base cost (the cost of educating a student with no special needs) produced by SSD and PJ approaches mean?
- (2) Does the base cost differ by district size?
- (3) How can the costs of serving students with special needs be used to create student weights?

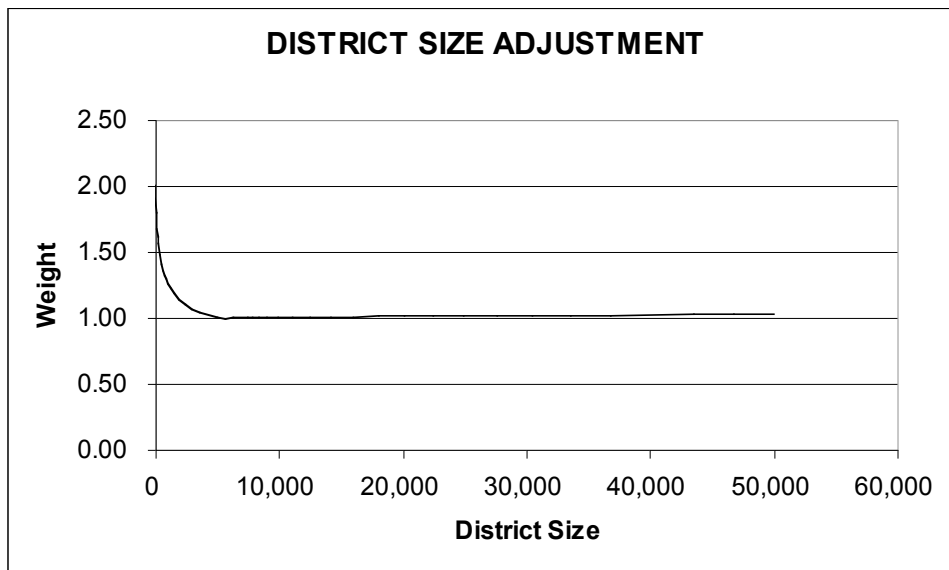
Once we respond to these questions, it becomes possible to estimate costs for each of Minnesota's more than 400 districts.

The two approaches we used to study the cost of adequacy produced two different base cost results. The figures are \$5,938 for the PJ and \$5,359 for the SSD. This means the SSD figure represents 90 percent of the PJ figure.

It is important to note that the SSD and PJ approaches really address two different standards. The SSD base cost represents what districts need to be spending today (2004-05 figures) to be successful. The PJ base cost represents what districts need to be spending in the future to meet the higher performance standards of 2013-14, as specified by the panels of educators. This higher performance expectation explains the higher cost associated with the PJ base.

Size and Special Need Students

As discussed previously, APA reviewed information from three previous adequacy studies conducted in Colorado, Missouri and South Dakota to determine an appropriate size adjustment. The average figures produced from these three studies allowed APA to create a formula to account for differences in costs based on district size. The following graph shows how the weight for district size is the highest in the smallest districts drops to one around 7,500 students and then increases slightly as districts grow.



From the graph, APA was able to create two equations that mimic the graph above and could be used to apply the district size adjustment for any district in Minnesota. They are :

If a district is below 7,500 students then:

$$3.643 * \text{District Size}^{-0.1538} \text{ with a minimum of } 1.00$$

If a district is above 7,500 students then:

$$0.0108 * \text{LN}(\text{District Size}) + 0.9064$$

These formulas produce district size adjustments that can be applied to any base cost to adjust for district size differences. The table below shows the effect of the formula on a number of different size districts.

District Size Adjustment

50	2.00
100	1.79
250	1.56
500	1.40
750	1.32
1,000	1.26
2,500	1.09
5,000	1.00
7,500	1.00
10,000	1.01
25,000	1.02
50,000	1.02

The weights for students with special needs were laid out in the PJ chapter. They are:

- Special Education – 1.00
- At-Risk - .75
- LEP - .90

Again, a weight indicates the additional resources needed to educate a student with a special need up to the standard. That is to say if a student is identified at as needing special education services their district would receive the base amount for that student plus and an additional amount equal to the base, a weight of 1.00, for the student. The weight is applied to the districts size adjusted base figure. The examples below show how the district size adjustment and weights would be applied to two different hypothetical districts.

Examples of How APA's Formulas Work

A) If a Minnesota district had 250 students, 27 of whom were in special education programs; 80 were at-risk; and 10 were in LEP programs; the cost of adequacy, using the SSD base would be calculated as follows:

1. Base cost = 250 X \$8,360 or \$2,090,000
2. At-risk = 80 X .75 X \$8,360 or \$501,600
3. LEP = 10 X .90 X \$8,360 or \$75,240
4. Special Education = 27 X 1.00 X \$8,360, or \$225,720

DISTRICT TOTAL: \$2,892,560

TOTAL PER STUDENT: \$2,892,560 divided by 250 = \$11,570

B) For a larger Minnesota district (with 10,000 students) that has 1,080 children in special education; 3,200 at-risk; and 400 in ELL programs; the calculation would be as follows:

1. Base cost = 10,000 X \$5,413 or \$54,130,000
2. At-risk = 3,200 X .75 X \$5,413, or \$12,991,200
3. LEP = 400 X .90 X \$5,413, or \$1,948,680
4. Special Education = 1,080 X 1.00 X \$5,413, or \$5,846,040

DISTRICT TOTAL: \$74,915,920

TOTAL PER STUDENT: \$74,915,920 divided by 10,000 = \$7,492

These formulas can be applied to every district in the state to determine both their SSD and PJ adequacy figures, excluding capital, transportation and food service.

VI. COMPARING ADEQUACY COSTS WITH ACTUAL SPENDING IN MINNESOTA SCHOOL DISTRICTS

APA's December 2005 Phase I report, shown in Appendix E, provided a simple "gap" figure for the state of Minnesota. This figure was derived by looking at the state in aggregate and assuming that any district with spending currently above adequacy would only spend at the adequacy level and districts currently spending below adequacy would be brought up to adequate levels. In this chapter, APA uses the updated adequacy figures to go beyond this simple comparison.

Appendices C-1 and C-2 examine the differences between current spending and adequate spending using the SSD and PJ approaches. The first decision that had to be made was to decide which current expenditure figures to use for comparison. The simple answer would be to use all current comparable expenditures. This ignores the fact that many Minnesota districts use Operating Referendum monies to supplement their educational programs. This means that local school districts raise additional funds, outside the state funding program, in order to meet the needs of their district. APA felt deducting the Operating Referendum money from current expenditures was the best comparison figure since the adequacy figures are meant to be funded through the state funding program.

APA next had to decide how to address the differences in cost of living between districts in Minnesota. In Chapter IV, APA examined the varied costs to districts of providing education through the Location Cost Metric (LCM.) An example of how the LCM would be applied would be if a district had an LCM of 1.08 and an adequacy need of \$1,000,000, the LCM adjustment would increase the districts adequacy amount by 8% to \$1,080,000. The analysis determined that most districts are located in counties whose LCM is below the state average. Forty-eight districts are in counties whose LCM is above the state average. APA decided to apply the LCM only to districts whose LCM was above the state average.

In order to examine the differences APA used 2004-05 demographic data for districts. For the comparison, APA assumed that students identified in any special needs category (special education, at-risk or LEP) would receive the full value of the corresponding special need weight. So even if a student is both special education and at-risk they would receive the full weighting for both categories, in this case an additional 1.0 for special education and .75 for at-risk. A state may chose to only provide one weight for a student in multi categories. APA did not have the student level data to determine the number of students that are in more than one category for this comparison.

The appendices compare the cost of adequacy to actual, comparable spending in 2004-05, excluding capital, transportation, and food service, for the 341 districts in Minnesota for which APA had full data. APA divided the districts up into five size categories for comparison:

1. Very Small districts with less than 500 students;
2. Small districts with 500 - 1,499 students;
3. Moderate districts with 1,500 - 4,999 students;
4. Large districts with 5,000 - 9,999 students; and
5. Very Large districts with 10,000 or more students.

Appendices C-1 and C-2 are broken into six sections. Section I describes the number of districts and enrollment of those districts for each size category. Section II of each appendix, examines the adequacy figures broken down by base cost, special education, at-risk and LEP. Section III of the appendices, looks at the total adequacy amounts per pupil. Section IV examines the current spending of the districts. Section V examines those districts whose current spending is above adequacy. Section VI examines those districts whose current spending is below adequacy. The Section VI total spending difference often represents the short term cost to the state of adequacy. This figure assumes that districts above adequacy would be held harmless in the short term and the state would focus on bringing districts below adequacy up to adequate levels.

Section I of Appendices C-1 and C-2 shows the 2004-05 demographic characteristics of Minnesota school districts. There were 87 very small districts, 145 small districts, 73 moderate size districts, 21 large districts, and 15 very large districts. Of the 801,191 students enrolled in these 341 districts, 25,980 students were in very small districts, 133,599 students were in small districts, 200,470 students were in moderate districts, 150,475 students were in large districts and 290,667 students were in very large districts.

Section II of Appendices C-1 and C-2 indicates the total cost of adequacy for the state as a whole in 2004-05 based on the SSD approach (in Appendices C-1), and the PJ approach (in Appendices C-2). For example, in Appendices C-1, using the SSD base cost, the total cost of an adequate education in 2004-05 would have been about \$6,905.6 million. The cost of providing base services to all students would have been \$4,874.1 million. The added cost to serve students with special needs would have been: \$663.9 million to serve special education students; \$1,077.6 million to serve at-risk students; and \$290.0 million to serve LEP. Taken together, these costs equate to \$8,619 per student (as shown in Section III of Appendix C-1).

Section IV of Appendices C-1 and C-2 display actual, comparable spending in 2004-05. In the example of Appendices C-1, using the SSD approach, the 341 school districts spent \$5,863.8 million, or \$7,319 per student. These figures suggest that school districts would have needed to spend \$1,041.8 million more in order to reach an SSD-adequate level of spending. In Appendix C-2, using the PJ approach districts would need to spend an additional \$1,787.7 million.

To gain a better understanding of variations in resources currently available to districts, it is important to examine separately those districts that appear to be spending above adequate levels and those spending below adequate levels. Section V of Appendices C-1 and C-2 shows districts spending above the amount estimated to be adequate in 2004-05. Using the same example of

Appendix C-1, of the 341 districts, 10 were spending above SSD-adequate levels. Those districts, which enrolled 35,568 students, spent \$17.6 million over SSD adequacy, or \$491 per student, on average. The districts that were spending above adequacy fell into all of the size categories. Appendices C-2 (using the PJ approach) shows that the number above adequacy was just 4 districts. Those districts' spending above adequacy was \$1.5 million.

Section VI of Appendices C-1 and C-2 show which districts were spending below the estimated adequacy level. In the example of Appendices C-1, the data shows that 331 districts would have needed a total of \$1059.4 million, or \$1,384 per student, on average, to bring them up to the SSD adequacy level. In section VI of Appendices C-2, 337 districts are below adequacy and an additional \$1,789.4 million or \$2,258 would be needed to bring them up to the adequacy level.

Appendices C-1 and C-2 only consider the differences in costs between current spending and estimated adequacy amounts. They do not determine who should pay for any part of the funding. Also, neither the tables nor this report lay out how Minnesota might move from the SSD base funding figure to the PJ base funding figure. All of these issues would need to be resolved for Minnesota to have in place an adequate school funding system.

VII. OTHER ELEMENTS

As mentioned at the end of chapter six this report only estimates the amounts needed in each district to reach adequate funding. It does not address who should pay for what share of the district needs and does not take into account the amount available from the federal government to pay for the cost of adequacy. This chapter lists a number of other issues that either were not addressed in this report or need further explanation when considering how to create a funding system for Minnesota.

Demographics

- A decision needs to be made on applying weights for special needs students who qualify for more than one special need weight. Some states have only applied the highest of the weights for the student. Other states use multiple weights. A student information system with very specific information is needed in order to determine which students are eligible in more than one area.
- For this report the free and reduced lunch count was used as the proxy for the number of at-risk students in each district. Different proxies could be considered.
- The issue of declining enrollment needs to be addressed in any implementation of the adequacy figures.
- The impact of mobility on the cost to districts has not been considered as part of this report.

Available Funds

- The study does not consider how adequacy should be paid for. A decision has to be made on how to determine the state and local's share.
- Federal dollars have not been taken into consideration during this analysis. Federal dollars are available to pay for some of the adequacy amount. These dollars are usually associated with the special needs populations.

Other Issues Not Considered

- Transportation was not evaluated as part of the adequacy study. In order to ensure that adequate funding is available the cost of transportation must be evaluated
- Capital was not evaluated as part of the adequacy study. The PJ approach could include resources that would be difficult to house in

current facilities. A full capital study would need to be undertaken to ensure full adequacy.

- APA used the Minneapolis-St. Paul CPI to inflate the adequacy figures to the 2004-05 year. APA decided to use the CPI figure to be consistent with past work done by the firm. The state of Minnesota has alternate approaches to addressing the rate of inflation which could be used in place of the CPI.

**APPENDIX A-1
MINNESOTA SUCCESSFUL DISTRICTS
USING 2008-09 CRITERIA**

0031	BEMIDJI
0032	BLACKDUCK
0036	KELLIHER
0077	MANKATO
0097	MOOSE LAKE
0111	WATERTOWN-MAYER
0181	BRAINERD
0182	CROSBY-IRONTON
0192	FARMINGTON
0194	LAKEVILLE
0195	RANDOLPH
0196	ROSEMOUNT-APPLE VALLEY-EAGAN
0270	HOPKINS
0271	BLOOMINGTON
0273	EDINA
0277	WESTONKA
0282	ST. ANTHONY-NEW BRIGHTON
0283	ST. LOUIS PARK
0299	CALEDONIA
0306	LAPORTE
0314	BRAHAM
0317	DEER RIVER
0378	DAWSON-BOYD
0458	TRUMAN
0533	DOVER-EYOTA
0595	EAST GRAND FORKS
0621	MOUNDS VIEW
0623	ROSEVILLE
0709	DULUTH
0720	SHAKOPEE
0739	KIMBALL
0811	WABASHA-KELLOGG
0829	WASECA
0832	MAHTOMEDI
0857	LEWISTON-ALTURA
0858	ST. CHARLES
0885	ST. MICHAEL-ALBERTVILLE
2125	TRITON
2143	WATERVILLE-ELYSIAN-MORRISTOWN
2144	CHISAGO LAKES
2174	PINE RIVER-BACKUS
2184	LUVERNE
2397	LESUEUR-HENDERSON
2805	ZUMBROTA-MAZEPPA
2853	LAC QUI PARLE VALLEY

**APPENDIX A-2
MINNESOTA SUCCESSFUL DISTRICTS
MEETING THE INSTRUCTION EFFICIENCY
SCREEN**

0031	BEMIDJI
0032	BLACKDUCK
0077	MANKATO
0097	MOOSE LAKE
0111	WATERTOWN-MAYER
0181	BRAINERD
0182	CROSBY-IRONTON
0192	FARMINGTON
0194	LAKEVILLE
0196	ROSEMOUNT-APPLE VALLEY-EAGAN
0270	HOPKINS
0271	BLOOMINGTON
0273	EDINA
0277	WESTONKA
0282	ST. ANTHONY-NEW BRIGHTON
0283	ST. LOUIS PARK
0314	BRAHAM
0317	DEER RIVER
0458	TRUMAN
0533	DOVER-EYOTA
0595	EAST GRAND FORKS
0621	MOUNDS VIEW
0623	ROSEVILLE
0709	DULUTH
0720	SHAKOPEE
0829	WASECA
0832	MAHTOMEDI
0857	LEWISTON-ALTURA
0858	ST. CHARLES
0885	ST. MICHAEL-ALBERTVILLE
2125	TRITON
2143	WATERVILLE-ELYSIAN-MORRISTOWN
2144	CHISAGO LAKES
2174	PINE RIVER-BACKUS
2397	LESUEUR-HENDERSON
2805	ZUMBROTA-MAZEPPA
2853	LAC QUI PARLE VALLEY

**APPENDIX A-3
MINNESOTA SUCCESSFUL DISTRICTS
MEETING THE ADMINISTRATION
EFFICIENCY SCREEN**

0031	BEMIDJI
0032	BLACKDUCK
0077	MANKATO
0097	MOOSE LAKE
0111	WATERTOWN-MAYER
0181	BRAINERD
0182	CROSBY-IRONTON
0192	FARMINGTON
0194	LAKEVILLE
0196	ROSEMOUNT-APPLE VALLEY-EAGAN
0270	HOPKINS
0271	BLOOMINGTON
0273	EDINA
0277	WESTONKA
0282	ST. ANTHONY-NEW BRIGHTON
0283	ST. LOUIS PARK
0314	BRAHAM
0317	DEER RIVER
0533	DOVER-EYOTA
0595	EAST GRAND FORKS
0621	MOUNDS VIEW
0623	ROSEVILLE
0709	DULUTH
0720	SHAKOPEE
0739	KIMBALL
0811	WABASHA-KELLOGG
0829	WASECA
0832	MAHTOMEDI
0857	LEWISTON-ALTURA
0858	ST. CHARLES
0885	ST. MICHAEL-ALBERTVILLE
2125	TRITON
2143	WATERVILLE-ELYSIAN-MORRISTOWN
2144	CHISAGO LAKES
2174	PINE RIVER-BACKUS
2184	LUVERNE
2397	LESUEUR-HENDERSON
2805	ZUMBROTA-MAZEPPA
2853	LAC QUI PARLE VALLEY

**APPENDIX A-4
MINNESOTA SUCCESSFUL DISTRICTS
MEETING THE ADMINISTRATION
EFFICIENCY SCREEN**

0031	BEMIDJI
0032	BLACKDUCK
0077	MANKATO
0097	MOOSE LAKE
0111	WATERTOWN-MAYER
0181	BRAINERD
0182	CROSBY-IRONTON
0192	FARMINGTON
0194	LAKEVILLE
0195	RANDOLPH
0196	ROSEMOUNT-APPLE VALLEY-EAGAN
0270	HOPKINS
0271	BLOOMINGTON
0273	EDINA
0277	WESTONKA
0282	ST. ANTHONY-NEW BRIGHTON
0283	ST. LOUIS PARK
0299	CALEDONIA
0314	BRAHAM
0317	DEER RIVER
0378	DAWSON-BOYD
0458	TRUMAN
0533	DOVER-EYOTA
0595	EAST GRAND FORKS
0621	MOUNDS VIEW
0623	ROSEVILLE
0709	DULUTH
0720	SHAKOPEE
0739	KIMBALL
0811	WABASHA-KELLOGG
0829	WASECA
0832	MAHTOMEDI
0857	LEWISTON-ALTURA
0858	ST. CHARLES
0885	ST. MICHAEL-ALBERTVILLE
2125	TRITON
2143	WATERVILLE-ELYSIAN-MORRISTOWN
2144	CHISAGO LAKES
2174	PINE RIVER-BACKUS
2184	LUVERNE
2397	LESUEUR-HENDERSON
2805	ZUMBROTA-MAZEPPA
2853	LAC QUI PARLE VALLEY

**APPENDIX B
LOCATION COST METRIC BY COUNTY**

County	Wages	Housing	COLA	LCM
CARVER	1.10	1.12	1.14	1.11
HENNEPIN	1.14	1.02	1.15	1.12
WASHINGTON	1.09	1.10	1.12	1.10
SCOTT	1.09	1.09	1.12	1.10
DAKOTA	1.10	1.01	1.10	1.08
ANOKA	1.10	0.98	1.09	1.07
RAMSEY	1.12	0.93	1.09	1.08
OLMSTED	0.92	1.00	0.92	0.93
DODGE	0.88	1.00	0.88	0.90
STEELE	0.88	1.00	0.88	0.90
MOWER	0.88	1.00	0.88	0.90
WINONA	0.87	1.00	0.87	0.89
WABASHA	0.86	1.00	0.86	0.89
FREEBORN	0.86	1.00	0.86	0.89
KOOCHICHING	0.85	1.00	0.85	0.88
FILLMORE	0.85	1.00	0.85	0.88
HOUSTON	0.85	1.00	0.85	0.88
SAINT LOUIS	0.84	1.00	0.84	0.87
RICE	0.88	0.92	0.86	0.88
CARLTON	0.83	1.00	0.83	0.86
ITASCA	0.83	1.00	0.83	0.86
LAKE	0.83	1.00	0.83	0.86
STEARNS	0.82	1.00	0.82	0.86
BENTON	0.82	1.00	0.82	0.85
AITKIN	0.81	1.00	0.81	0.85
MARTIN	0.80	1.00	0.80	0.84
COOK	0.80	1.00	0.80	0.84
SHERBURNE	0.82	0.95	0.81	0.85
WRIGHT	0.82	0.94	0.80	0.84
KANDIYOHI	0.78	1.00	0.78	0.83
RENVILLE	0.78	1.00	0.78	0.82
MEEKER	0.77	1.00	0.77	0.82
BLUE EARTH	0.77	1.00	0.77	0.81
FARIBAULT	0.77	1.00	0.77	0.81
BROWN	0.76	1.00	0.76	0.81
MARSHALL	0.76	1.00	0.76	0.81
NICOLLET	0.76	1.00	0.76	0.81
WASECA	0.76	1.00	0.76	0.81
LESUEUR	0.76	1.00	0.76	0.81
ISANTI	0.76	1.00	0.76	0.81
KANABEC	0.76	1.00	0.76	0.81
CHISAGO	0.76	0.98	0.76	0.81
MILLE LACS	0.75	1.00	0.75	0.80
ROSEAU	0.75	1.00	0.75	0.80
PINE	0.75	1.00	0.75	0.80
WATONWAN	0.75	1.00	0.75	0.80
PENNINGTON	0.75	1.00	0.75	0.80
SIBLEY	0.74	1.00	0.74	0.79
GOODHUE	0.88	0.74	0.80	0.84
MAHNOMEN	0.74	1.00	0.74	0.79
CROW WING	0.74	1.00	0.74	0.79
STEVENS	0.73	1.00	0.73	0.79
KITTSO	0.73	1.00	0.73	0.79
POLK	0.73	1.00	0.73	0.79
DOUGLAS	0.73	1.00	0.73	0.79
BELTRAMI	0.73	1.00	0.73	0.78
NORMAN	0.73	1.00	0.73	0.78
RED LAKE	0.73	1.00	0.73	0.78
MORRISON	0.73	1.00	0.73	0.78
HUBBARD	0.73	1.00	0.73	0.78

MORRISON	0.73	1.00	0.73	0.78
HUBBARD	0.73	1.00	0.73	0.78
LAKE OF THE WOODS	0.73	1.00	0.73	0.78
CLAY	0.73	1.00	0.73	0.78
WADENA	0.73	1.00	0.73	0.78
OTTER TAIL	0.72	1.00	0.72	0.78
BECKER	0.72	1.00	0.72	0.78
TODD	0.72	1.00	0.72	0.78
WILKIN	0.72	1.00	0.72	0.78
LYON	0.72	1.00	0.72	0.78
POPE	0.72	1.00	0.72	0.78
CLEARWATER	0.72	1.00	0.72	0.78
GRANT	0.72	1.00	0.72	0.77
CASS	0.72	1.00	0.72	0.77
MCLEOD	0.71	1.00	0.71	0.77
NOBLES	0.71	1.00	0.71	0.77
REDWOOD	0.70	1.00	0.70	0.76
JACKSON	0.70	1.00	0.70	0.76
TRAVERSE	0.70	1.00	0.70	0.76
CHIPPEWA	0.70	1.00	0.70	0.76
SWIFT	0.70	1.00	0.70	0.76
ROCK	0.70	1.00	0.70	0.76
MURRAY	0.70	1.00	0.70	0.76
COTTONWOOD	0.70	1.00	0.70	0.76
PIPESTONE	0.70	1.00	0.70	0.76
YELLOW MEDICINE	0.69	1.00	0.69	0.76
LAC QUI PARLE	0.69	1.00	0.69	0.75
LINCOLN	0.69	1.00	0.69	0.75
BIG STONE	0.68	1.00	0.68	0.75

APPENDIX C-1

**ESTIMATING THE COST OF ADEQUACY MINNESOTA SCHOOL DISTRICTS
USING THE SUCCESSFUL SCHOOLS BASE IN 2004-05**

Without Charters and Referendum Spending, with LCM

	Very Small	Small	Moderate	Large	Very Large	<u>TOTAL</u>
I. <u>School District Characteristics</u>						
Range in Size of District (Students)	< 500	500- 1,500	1,501- 5,000	5,001- 10,000	> 10,000	
Number of Districts	87	145	73	21	15	341
Number of Students	25,980	133,599	200,470	150,475	290,667	801,191
II. <u>Estimated Aggregate Cost of Adequacy (millions)*</u>						
Base Cost	\$208.7	\$910.6	\$1,175.2	\$870.8	\$1,708.8	\$4,874.1
Special Education	\$31.1	\$129.8	\$155.7	\$107.8	\$239.5	\$663.9
At-Risk	\$64.0	\$232.3	\$232.4	\$105.9	\$443.0	\$1,077.6
LEP	\$1.9	\$22.8	\$40.2	\$28.1	\$197.0	\$290.0
Grand Total	\$305.7	\$1,295.5	\$1,603.5	\$1,112.6	\$2,588.3	\$6,905.6
III. <u>Estimated Cost of Adequacy Per Student*</u>						
<i>Grand Total</i>	<i>\$11,767</i>	<i>\$9,697</i>	<i>\$7,998</i>	<i>\$7,394</i>	<i>\$8,905</i>	<i>\$8,619</i>
IV. <u>Actual Comparable Spending*</u>						
Aggregate Total (millions)	\$202.0	\$959.4	\$1,398.8	\$1,013.5	\$2,290.1	\$5,863.8
<i>Per Student Total</i>	<i>\$7,776</i>	<i>\$7,181</i>	<i>\$6,977</i>	<i>\$6,735</i>	<i>\$7,879</i>	<i>\$7,319</i>

APPENDIX C-1 (Continued)

	Very Small	Small	Moderate	Large	Very Large	<u>TOTAL</u>
	< 500	500- 1,500	1,501- 5,000	5,001- 10,000	> 10,000	
V. <u>Districts with Higher Spending than the Amount Estimated to be Adequate</u>						
Number of Districts	2	1	5	1	1	10
Number of Students	278	1,077	16,436	7,075	10,772	35,638
Estimated 2004-05 Adequate Spending (Aggregate in millions)*	\$3.5	\$12.5	\$125.7	\$53.6	\$82.5	\$277.8
Actual 2004-05 Spending (Aggregate in millions)*	\$3.8	\$13.8	\$135.7	\$54.4	\$87.7	\$295.4
Actual Spending Over Adequacy (Aggregate in millions)*	\$0.3	\$1.3	\$10.0	\$0.8	\$5.2	\$17.6
Per Student Spending Over Adequacy	\$1,092	\$1,145	\$608	\$110	\$484	\$491
VI. <u>Districts with Lower Spending than the Amount Calculated to be Adequate</u>						
Number of Districts	85	144	68	20	14	331
Number of Students	25,702	132,522	184,034	143,400	279,895	765,553
Estimated 2004-05 Adequate Spending (Aggregate in millions)*	\$302.2	\$1,283.0	\$1,477.7	\$1,059.0	\$2,505.8	\$6,627.7
Actual 2004-05 Spending (Aggregate in millions)*	\$198.2	\$945.6	\$1,263.0	\$959.1	\$2,202.4	\$5,568.3
Actual Spending Under Adequacy (Aggregate in millions)*	\$104.0	\$337.4	\$214.7	\$99.9	\$303.4	\$1,059.4
Per Student Spending Under Adequacy	\$4,046	\$2,546	\$1,166	\$697	\$1,084	\$1,384

* Figures exclude spending for capital, transportation, and food service

APPENDIX C-2

**ESTIMATING THE COST OF ADEQUACY FOR MINNESOTA SCHOOL DISTRICTS
USING THE PROFESSIONAL JUDGMENT BASE IN 2004-05**

Without Charters, Less Operating Referendum, With LCM

	Very Small	Small	Moderate	Large	Very Large	<u>TOTAL</u>
I. <u>School District Characteristics</u>						
Range in Size of District (Students)	< 500	500- 1,500	1,501- 5,000	5,001- 10,000	> 10,000	
Number of Districts	87	145	73	21	15	341
Number of Students	25,980	133,599	200,470	150,475	290,667	801,191
II. <u>Estimated Aggregate Cost of Adequacy (millions)*</u>						
Base Cost	\$231.3	\$1,009.0	\$1,302.1	\$964.8	\$1,893.4	\$5,400.6
Special Education	\$34.4	\$143.8	\$172.6	\$119.4	\$265.3	\$735.5
At-Risk	\$70.9	\$257.4	\$257.5	\$117.4	\$490.9	\$1,194.1
LEP	\$2.1	\$25.2	\$44.5	\$31.2	\$218.3	\$321.3
Grand Total	\$338.7	\$1,435.4	\$1,776.7	\$1,232.8	\$2,867.9	\$7,651.5
III. <u>Estimated Cost of Adequacy Per Student**</u>						
<i>Grand Total</i>	<i>\$13,038</i>	<i>\$10,745</i>	<i>\$8,862</i>	<i>\$8,193</i>	<i>\$9,867</i>	<i>\$9,550</i>
IV. <u>Actual Comparable Spending*</u>						
Aggregate Total (millions)	\$202.0	\$959.4	\$1,398.8	\$1,013.5	\$2,290.1	\$5,863.8
<i>Per Student Total</i>	<i>\$7,776</i>	<i>\$7,181</i>	<i>\$6,977</i>	<i>\$6,735</i>	<i>\$7,879</i>	<i>\$7,319</i>

APPENDIX C-2 (Continued)

	Very Small	Small	Moderate	Large	Very Large	<u>TOTAL</u>
	< 500	500-1,500	1,501-5,000	5,001-10,000	> 10,000	
V. <u>Districts with Higher Spending than the Amount Estimated to be Adequate</u>						
Number of Districts	1	--	3	--	--	4
Number of Students	80	--	8,454	--	--	8,534
Estimated 2004-05 Adequate Spending (Aggregate in millions)*	\$1.5	--	\$73.5	--	--	\$75.0
Actual 2004-05 Spending (Aggregate in millions)*	\$1.6	--	\$74.9	--	--	\$76.5
Actual Spending Over Adequacy (Aggregate in millions)*	\$0.1	--	\$1.4	--	--	\$1.5
Per Student Spending Over Adequacy	\$1,132	--	\$168	--	--	\$177
VI. <u>Districts with Lower Spending than the Amount Calculated to be Adequate</u>						
Number of Districts	86	145	70	21	15	337
Number of Students	25,900	133,599	192,016	150,475	290,667	792,657
Estimated 2004-05 Adequate Spending (Aggregate in millions)*	\$337.2	\$1,435.5	\$1,703.2	\$1,232.9	\$2,867.9	\$7,576.7
Actual 2004-05 Spending (Aggregate in millions)*	\$200.4	\$959.4	\$1,323.9	\$1,013.5	\$2,290.1	\$5,787.3
Actual Spending Under Adequacy (Aggregate in millions)*	\$136.8	\$476.1	\$379.3	\$219.4	\$577.8	\$1,789.4
Per Student Spending Under Adequacy	\$5,282	\$3,564	\$1,976	\$1,458	\$1,988	\$2,258

* Figures exclude spending for capital, transportation, and food service

APPENDIX D
LIST OF DISTRICTS WITH LCM FIGURES ABOVE 1.00

District Number	District	District County	LCM
0001	MINNEAPOLIS	27	1.12
0006	SOUTH ST. PAUL	19	1.08
0011	ANOKA-HENNEPIN	02	1.07
0012	CENTENNIAL	02	1.07
0013	COLUMBIA HEIGHTS	02	1.07
0014	FRIDLEY	02	1.07
0015	ST. FRANCIS	02	1.07
0016	SPRING LAKE PARK	02	1.07
0108	NORWOOD	10	1.11
0110	WACONIA	10	1.11
0111	WATERTOWN-MAYER	10	1.11
0112	CHASKA	10	1.11
0191	BURNSVILLE	19	1.08
0192	FARMINGTON	19	1.08
0194	LAKEVILLE	19	1.08
0195	RANDOLPH	19	1.08
0196	ROSEMOUNT-APPLE VALLEY-EAGAN	19	1.08
0197	WEST ST. PAUL-MENDOTA HTS.-EAGAN	19	1.08
0199	INVER GROVE HEIGHTS SCHOOLS	19	1.08
0200	HASTINGS	19	1.08
0270	HOPKINS	27	1.12
0271	BLOOMINGTON	27	1.12
0272	EDEN PRAIRIE	27	1.12
0273	EDINA	27	1.12
0276	MINNETONKA	27	1.12
0277	WESTONKA	27	1.12
0278	ORONO	27	1.12
0279	OSSEO	27	1.12
0280	RICHFIELD	27	1.12
0281	ROBBINSDALE	27	1.12
0282	ST. ANTHONY-NEW BRIGHTON	27	1.12
0283	ST. LOUIS PARK	27	1.12
0284	WAYZATA	27	1.12
0286	BROOKLYN CENTER	27	1.12
0621	MOUNDS VIEW	62	1.08
0622	NORTH ST PAUL-MAPLEWOOD	62	1.08
0623	ROSEVILLE	62	1.08
0624	WHITE BEAR LAKE	62	1.08
0625	ST. PAUL	62	1.08
0716	BELLE PLAINE	70	1.10
0717	JORDAN	70	1.10
0719	PRIOR LAKE-SAVAGE AREA SCHOOLS	70	1.10
0720	SHAKOPEE	70	1.10
0721	NEW PRAGUE AREA SCHOOLS	70	1.10
0831	FOREST LAKE	82	1.10
0832	MAHTOMEDI	82	1.10
0833	SOUTH WASHINGTON COUNTY	82	1.10
0834	STILLWATER	82	1.10