Approved: January 19, 1995
Date

MINUTES OF THE SENATE COMMITTEE ON EDUCATION

The meeting was called to order by Chairperson Dave Kerr at 1:30 p.m. on January 18, 1995 in Room 123-S of the Capitol.

All members were present except: Senator Sherman Jones
Senator Anthony Hensley

Committee staff present: Ben Barrett, Legislative Research Department
Carolyn Rampy, Legislative Research Department
Avis Swartzman, Revisor of Statutes
Brenda Dunlap, Committee Secretary

Conferees appearing before the committee: Dr. Mary F. Hughes
Dr. Gerald R. Bass

Dr. Hughes and Dr. Bass presented their findings and recommendations based upon a study they did to determine an economy of scale factor for low enrollment school districts.

Dr. Bass used a "qualitative" approach which consisted of a review of literature and interviews with Kansas public school superintendents. He found no consistent definition of "small" as applies to schools or school districts in the literature reviewed; and the interview process likewise failed to provide an acceptable definition or criterion for a low enrollment scale factor. He recommended that the Kansas legislature should change the terminology of "low enrollment" to "district size." He further stated that the legislature should consider the state's obligation for funding small school districts that remain small through local choice rather than because of low population density. By establishing a geographical isolation factor and holding non-isolated districts locally responsible, at least in part, for the supplemental funding, the legislature could reduce the state's cost of this portion of the financing plan, and allow non-isolated small districts to continue in operation at the option and expense of the local residents. (See Attachment 1,2, 3 & 4)

Dr. Hughes used a "quantitative" approach using statistical analyses of data reviewed from many Kansas school districts. She found that the only expenditure item not biased by past legislative appropriations and utilized by all schools was electricity; and she recommended an adjustment to operations and maintenance cost based on the median percentage of electricity costs per pupil to non-salary related operations and maintenance costs per pupil. Further, the data have indicated that non-salary related expenditures are not a function of school district size. Therefore, only salary related expenditures should be allocated through the present low enrollment weighting formula. The remaining amount of low enrollment weighting funds should be allocated in equal per pupil amounts to all school districts in the state. (See Attachment 1,2,3 & 4)

Senator Oleen made a motion to approve the minutes of the January 17, 1995 meeting. Senator Lawrence seconded the motion, and the motion carried.

The meeting was adjourned at 2:30 p.m.

The next meeting is scheduled for January 19, 1995.

SENATE EDUCATION COMMITTEE COMMITTEE GUEST LIST

DATE: 1-18-95

NAME	REPRESENTING
Marla Hise	KACC
Gerald Henderson	USA of KS
DAN NOLLENSWANDER	USD 250
Kim Bohr	4th Enrollment USD's
Fred Kaufman	#489 Hays
Mark Houtman	USD 489, HAYS
Helen Stephens	BV USD 229
Jim Allen	KFHC
Patrick J. Hurley	KSC/KEY
Robin Lehman	Olathe District Schools
KEVIN T. STAMPER	INTERN - SEN. J. MORAN
Diana Gjerstad	USD 259
Carl Gallagher	AG [illegible]
Craig Grant	KNEA
GREG HANSEN	INTERN - SEN. HARRINGTON
Paul Davis	Senator Hensley
[illegible]	Overland Park Chamber of Commerce
[illegible]	BVSD
Jacque Oakes	SQE

Multi-phased Study of an Economy of Scale Weight Factor for Low Enrollment School Districts in the State of Kansas

Mary F. Hughes

Gerald R. Bass

Presented to the

Legislative Coordinating Council,

Kansas Legislature

December 19, 1994

In the development of the School District Finance and Quality Performance Act (hereinafter referred to as the "Act"), the Kansas Legislature included a weighting factor for low enrollment districts, defined as those with fewer than 1,900 students. On December 16, 1993, Judge Marla J. Luckert ruled that the low enrollment weighting in the Act did not "contain a rational basis grounded upon education theory." The Act was then ruled to be unconstitutional because the low enrollment weighting was not deemed to be severable.

On April 27, 1994, the Kansas Legislative Coordinating Council (LCC) executed a contract with Drs. Mary Hughes and Gerald Bass (hereinafter, "the consultants") to study the low enrollment weighting and to make recommendations to the LCC and the Kansas Legislature regarding "an appropriate economy of scale weight factor for low enrollment school districts to document a rational basis for providing additional revenue to low enrollment school districts. This document has been provided as the final report pursuant to that contract.

On December 2, 1994, the Kansas Supreme Court handed down its ruling on the appeal of Judge Luckert's decision. The Court reversed the ruling relative to the low enrollment factor and ruled that the QPA was constitutional.

> . . . The legislature, as the people's representatives, studied the whole gamut of public school education and its funding, heard from many interested persons expressing different concerns, altered the existing public policy, and enacted this legislation into law. . . . If experience establishes that the Act needs further

> revision, the legislature will have ample opportunity to do so, as it has already done in a number of significant respects. Applying the appropriate standards of review to this legislation, we conclude the Act is within all asserted constitutional limitations and, accordingly, is constitutionally permissible legislation.

The first portion of this contains a review of the literature, conducted by Dr. Bass, regarding low enrollment schools and school districts, including an examination of the challenges facing such districts and the state policy bases and associated financial systems which have been developed in response to such challenges. The second segment is used to provide a description of the qualitative methods used by Dr. Bass in conducting interviews with selected school superintendents and the results of that research. Following that is an overview of the quantitative methods used by Dr. Hughes to analyze financial and related data regarding Kansas school districts, followed by the findings of that analysis process. The final part of the study contains the consultants' recommendations.

Review of the Literature

This section of the study presents results of a review of literature pertaining to low enrollment school districts. First, a rationale for providing supplemental revenue to such districts is developed by briefly examining the problems facing small schools, including issues related to the concept of economy of scale. The next portion of this review is focused on various studies which have sought to identify optimum school and/or school district sizes or have otherwise examined the relationship between size and costs in educational settings. The third segment contains a report of various policy bases reflective of state leaders' perceptions of low enrollment schools and

resultant mechanisms by which states have provided such schools with supplemental revenue.

Problems of Small Schools

Few would question the statement that small schools face many problems. Among the most significant of these are the problems associated with high per-pupil costs, "inefficient" use of resources, limited curriculum, and staffing. These problems and possible solutions are examined here in order to propose a rationale for the employment of low enrollment weighting factors.

Discussions of the problems facing small schools in America generally include high costs per pupil as a major problem, or as a major consequence of other problems. Johns and Alexander (1971), Pierce et al. (1975), Johns (1975), Burrup (1977), the Pennsylvania Department of Education (1977), and Swift (1978) all cited the special needs and resultant high costs of small schools. McLure (1947) gave a representative view regarding the high costs of small schools.

> . . . in small communities where there are not enough children to form large schools the people must spend more money per pupil in order to provide education comparable to that provided in larger communities where larger schools can be operated (pp. 2-3).

A report by the Washington [State] Temporary Special Levy Study Commission (1971) cited the reasons for these high per pupil costs as low student-teacher ratios, transportation needs, and fixed operating and maintenance expenses. In that document, the Commission members noted that, while small schools typically had low teacher salaries, those savings were more than offset by their low student-teacher ratios. Honey (1978) noted that the demands placed on small schools by a state-mandated curriculum

aggravated the cost. Sher (1978) attributed high per-pupil costs to transportation, energy, administrative overhead, and "other fixed costs." McLure (1947) separated the higher costs into two categories: small school, or size, costs and transportation costs. Johns and Morphet (1975) said that "relatively small high schools are even more expensive and probably less satisfactory than small elementary schools" (p. 188). An example of these higher costs was given by the Washington Temporary Special Levy Study Commission (1971) .

> The average per-pupil expenditure in [Washington] (1968-69) was $662. Eighty percent of the school districts larger than 1,000 students spent between $560 and $1,080 per pupil, and 50 percent spent between $600 and $800 per pupil. All 25 high school districts smaller than 200 students spent more than $770 per student, and 10 spent [in excess of] $1,000 per student (p. 23).

Sadler and Ching (1975) used a linear programming model to derive per student costs and confirmed, in hypothetical models based upon actual input data, the increasing costs as a consequence of decreasing size of high schools.

Closely related to costs is the concept of efficiency of operation. Levin (1970) described efficiency as the use of physical resources or dollar budget in such a way as to achieve greater educational output. He also equated efficiency with the term "economies of scale." Cohn (1968) explained economies of scale as the ability of a larger school "to spend a smaller amount of resources per student for the same quality of education" (p. 434). Hanson (1964); Swanson (1966); Johns and Alexander (1971); Rossmiller (1973); Chambers, Odden, and Vincent (1976); and Webb (1979) all noted that small schools tend to utilize available resources in an inefficient manner. Efficiency is possible in larger districts because of larger classes which provide the ability to allocate the costs of specialized equipment, administration, and other budget

items over a larger enrollment (White & Tweten, 1973). Reischauer and Hartman (1973) illustrated what is perhaps the most commonly cited example of the inefficiency of small rural schools, the low pupil-teacher ratios: "a physics or calculus class that requires a specially trained teacher becomes terribly expensive because the cost of providing the class can be spread over only a handful of students" (p. 60). Blikre (1960), considering superintendents' responses to a questionnaire, said that "almost one-half the respondents looked upon more efficient use of money for educational purposes as a reason for more enlarged school districts" (p. 305).

The problems of cost and inefficiency were summarized by Johns (1975).

> Numerous researches in school finance have shown that the cost per student in sparsely settled areas and in small districts is greater for equivalent programs and services than in larger and more densely settled districts. Large school districts have economies of scale not possible in small population districts. Sparsely settled districts with a widely dispersed pupil population must operate small schools, especially small high schools, which have a high per student cost if appropriate educational programs are provided (p. 2).

Sher (1978), a former education advisor to the National Rural Center, conceded that small schools did have higher costs per pupil but strongly rebutted the implication that small schools were inefficient.

> The most important and unique feature of rural school finance lies in the higher costs associated with sparsity of population. A relatively sparse population base is, of course, a defining characteristic of any rural area. Thus, higher costs which arise as a consequence of this sparsity must be regarded as one of the economic facts of rural life rather than as evidence of wastefulness . . .
>
> The frugality and financial conservatism of farmers and other rural residents is legendary throughout the United States. Yet, ironically, the schools run by these same economy-minded rural citizens are routinely assailed outside the rural community as inefficient and uneconomical. . . . a strong case can be made that rural schools and districts use the financial resources

> available to them in as wise and effective a manner as any of their urban and suburban counterparts (p. 22).

Bass and Verstegen (1992) also addressed the issue of efficiency and small schools.

> Large schools and districts have long been considered to be more efficient because they achieved greater economies of scale by educating larger numbers of students at lower per-pupil costs than did small schools and school districts. This thinking is changing, however. Policymakers, educators, and others are beginning to question the effectiveness of the largest school districts, with their often impersonal atmospheres, high drop-out rates, and other attendant problems. In many cases, they are finding that the per-pupil cost of providing educational services is only one piece of the efficiency puzzle. More recent assessments of efficiency have considered relationships between revenues and such factors as increased learning, lower drop-out rates, increased participation in school events, and positive attitudes towards education. Now, when these are taken into account, questions are being raised as to whether the old adage "bigger is better" is the appropriate theme for schooling in the 1990s. Instead, in an era that focuses more on results in education, efficiency in schooling may be better interpreted by the expression 'small is wonderful' (p. 15).

They supported this statement with findings from studies by Fox (1981), Goodlad (1984), Butler and Monk (1985), and Walberg and Fowler (1987). All of these studies identified student achievement as a factor related to smaller school size. In fact, Butler and Monk concluded that, while larger districts were able to take advantage of economies of scale, such districts had a counterbalancing loss of productivity in educational outcomes.

Despite these findings, many of those cited in the literature consider curriculum to be a major problem area for small schools. Rossmiller (1973), Johns and Morphet (1975), Honey (1978), and Swift (1978) noted that many small school districts were able to offer only a limited educational program. Where small schools did offer a broader, more comprehensive program, they did so only at great cost. Reischauer and Hartman (1973) found curriculum offerings to be limited by the small school's inability to spread the costs of

specialized courses over a large enough number of students. Examining a range of course offerings, White and Tweeten (1973) calculated a minimum enrollment in average daily attendance (ADA) of 550 pupils in order to offer their "minimum" program at lowest cost. The "desirable" broader program could not be offered, they calculated, at minimum cost with an enrollment below 900 students (ADA). Benson (1975) found that "a district that enrolls 150 high school students cannot offer a full program of sciences, specialized mathematics, foreign language, and cultural subjects except at a cost [at that time] in the range of $4,000 to $6,000 a student (p. 107). When McLure (1975) studied school programs, he found that school size accounted for 55% of the variance in the breadth of program. The Washington Temporary Special Levy Study Commission (1971), after a thorough study of schools in that state, reported little difference in the curriculum of elementary schools of various sizes, attributing the substantial uniformity to the limited range of subjects taught at that level. At the high school level, however, the Commission found that the number of subjects offered for grades 10 through 12 varied from 13 courses in a small high school to 200 courses in a large metropolitan school. Districts smaller than 1,600 students offered an average of 35 subjects while larger districts offered an average of 55. The Commission reported that "there was a definite decline in curriculum diversity as school district size decreased" (p. 15). The Temporary Special Levy Study Commission summarized that portion of their report dealing with curriculum.

> . . . though it can be overdone, a certain amount of diversity in course offerings is valuable in stimulating different kinds of students. While the larger schools may have trouble setting priorities, the smaller schools do not even come close to equivalence in either the variety or depth of course work available in the larger schools. This is not, of course, to generalize about the quality of teaching in either size of school (p. 16).

In his 1984 work, A Place Called School, Goodlad took issue with this perspective.

> Expansion in school size usually was accompanied by curricular expansion, the availability of more alternatives, and the teaching and course resources necessary to tracking. I have difficulty arguing the virtue of any of these, given our data.
>
> Clearly we need sustained, creative efforts designed to show the curricular deficits incurred in very small high schools, the curricular possibilities of larger schools, and the point where increased size suggests no curricular gain. . . . The burden of proof, it appears to me, is on large size. Indeed, I would not want to face the challenge of justifying a senior, let alone junior, high of more than 500 to 600 students . . . Given our data, I would not want to risk losing what Dennison appears to have, with only 61 students in the junior and senior high schools combined, for the assumed curricular advantages of consolidating with another school--which in this as in many other instances would be quite far distant. Admittedly, the low student-teacher ratio required to provide Dennison's surprisingly rich curriculum is costly, but substantial costs would be incurred through consolidation (p. 310).

Problems relating to staff also affect small school districts. The National Commission on School District Reorganization (1948) noted that "the inadequacies of thousands of small school districts is [sic] most clearly shown in their ability to attract and keep well-qualified teachers" (p. 19). This problem was also noted by the Washington Temporary Special Levy Study Commission (1971).

> The average experience and education level of teachers tends to decrease with decreasing size of districts. This

> corresponds with an increased turnover rate in the smaller districts. . . .
>
> Teacher turnover rate per year is . . . averaging nearly 45 percent in districts with fewer than 200 students, and only 15 percent in districts with enrollments surpassing 1,600. The turnover rate has been nearly constant for all sizes of districts over the past four years (p. 24).

The Commission found that teachers in smaller schools tended to have lower pay scales and a greater teaching burden. Small school teachers averaged 1,089 classroom contact hours per year while teachers in larger districts averaged only 889. The Commission went on to note that "not only do small district teachers spend more time in class than do large district teachers, the secondary teachers in small districts teach a greater variety of courses each day" (p. 24). Senior high teachers in small districts taught 5.9 different subjects while those in large districts only taught 3.3 different subjects. National Education Association Research (1977) also noted the problems of staffing in small schools: fewer teachers with masters degrees, more non-degree teachers, less experienced teachers, longer work weeks, and lower salaries. Reischauer and Hartman (1973) suggested that "because small towns and rural areas have traditionally held little attraction for college-trained labor, it is possible that extremely high salaries . . . would have to be paid to lure highly qualified educators to isolated school districts" (p. 61).

Burrup (1977) enumerated what he referred to as "principles concerning small and large schools that have become accepted as a result of the experience of the several states over the years" (p. 92). Five of Burrup's principles provide a summary of the problems facing small schools.

> 1. . . . [it is an] obvious fact that some small schools and districts will always be needed in some sparsely populated areas of this country.

2. Small school districts and small attendance areas are comparatively inefficient...
3. Small schools suffer from curriculum limitations, even if the wealth of the district makes it financially possible to employ proportionately more and better-trained school staff members.
4. Small schools are often unable to attract the best teachers, regardless of the wealth or the available revenues in those districts.
5. Small schools suffer from lack of special services, such as health, psychological and counseling programs. No amount of revenue can provide these services if there are not enough pupils to warrant them (Burrup, 1977, p. 92).

While these problems are typically used to justify supplemental funding for school districts to compensate for the diseconomies of scale and other concerns associated with small size and/or the higher costs associated with rural locations, it would not be fair to end this portion of the report without noting that small school districts also have certain advantages, albeit in instructional and interpersonal arenas rather than in finance. For example, the statements of Goodlad and of Bass and Verstegen have already been cited in this section. Barker and Gump (1964) concluded that the larger schools may have more impressive appearance from the outside of their buildings but, according to their "inside-outside perceptual paradox," the smaller schools provide a better quality of education when viewed through closer study. As further explanation of this phenomenon, Barker (1985) noted that

> there exists in the small school a sense of pride and an attitude and sense of personal possession and involvement on the part of students, parents, teachers, administrators, and community residents. People residing in small communities generally have a feeling of extreme closeness. The school is referred to as 'our school.' To a great degree, the school is the community center in many small towns and rural areas (p. 1).

Other advantages of small schools have been cited by Carmichael (1982) who noted that teachers tend to interact with students more frequently and in

different ways in the smaller schools. And there are numerous other studies and reports which also cite the advantages of small and/or rural schools.

How Small Is Small?

One of the primary concerns in developing any state policy relative to small school districts is the definition of "small." Indeed, a primary concern of Judge Luckert was the identification of a "rational basis" for the low enrollment weighting factor. The review of literature identified a number of studies which have been focused, at least in part, on the issue of size as it pertains to the problems of small schools and small school districts.

> The typical sparsity adjustment . . . requires the state to specify 'cut-offs' or 'target' sizes for either districts or individual schools, or both. There is an assumption behind this type of legislation that there is some 'optimum' district or school size to which all schools or districts should aspire. . . . the rationale is that schools or school districts operating below this 'optimum' should be compensated for the fact that they will, at least in the foreseeable future, never be able to attain this desired 'optimum' (Bothwell, Johnson, & Hickrod, 1976, p. 57).

Some authors have recommended a "universal" size criterion which is not based on any particular geographical region and which should apply to most, if not all, schools. Smith (1960) found that "schools with an enrollment of less than 200-400 pupils are paying a premium for their educational programs" (p. 144). The National Commission on School District Reorganization (1948) recommended a minimum high school size of 75 students in each grade level while Conant (1959) considered 100 students as a minimum size for a high school graduating class. The "breaking point" for high schools was recommended by Mort (1933) to be 600. Osburn (1970) derived an optimum size of 2,244. Johns and Alexander (1971) considered a somewhat larger enrollment when discussing the optimum size for a school district.

> Although many viewpoints have been expressed concerning the ideal size for a school district or an administrative

> unit, research has revealed that reasonable economies of scale cannot be secured until districts have at least 10,000 students. These same studies suggest that enrollments of 4,000-5,000 students might be defensible in sparsely populated areas. Even though these sizes may seem large in terms of the enrollments of some school districts, they should be construed as minimal rather than as optimal. Recommendations relating to optimum size often range from 20,000 to 50,000 pupils per administrative unit (p. 112).

Other studies have used cost and enrollment data from a particular area to suggest size categories for that region alone. White and Tweeten (1973), employing Oklahoma data, suggested that 675 students provide a school district with optimal operating efficiency. But they allowed for a range of enrollments which permits efficient operation.

> . . . the curve is very flat between 400 and 1,100 [students counted in average daily attendance]. School districts can operate anywhere within this range without significant differences in per-unit costs. School districts operating outside this range face substantially higher per-unit costs (p. 51).

The Washington Temporary Special Levy Study Commission (1971) "found that districts with more than 1,000 students tend to provide a roughly comparable educational program" (p. 10). In an Iowa study, Cohn (1968) estimated optimum school size at about 1,500 pupils with a range of 1,277-1,663. Chambers, Odden, and Vincent (1976) found that "the financially optimal size for school districts in Missouri appears to be around 2500 students" (p. 31). Hanson (1964) recommended optimum school district sizes for a number of states, ranging from 20,000 students in Nebraska to 160,000 in New York.

In actual practice, the enrollment limits for schools which qualify for supplemental state aid are considerably lower than the optimum sizes recommended in much of the professional literature. Swift (1978) studied 17 states which recognized small schools for additional funding and found that the

maximum enrollments for such aid ranged from 100 to 1,000 students. The median size used by those states was 193 for elementary schools and 300 for secondary.

In a study by Bass (1980), state systems of funding schools employed size factors ranging from 10 pupils per school to 10,000 students per district. The states included in that study had finance mechanisms that provided funding only to schools or districts which met both size (number of students) and isolation criteria. The Texas formula in existence at that time provided an adjusted "personnel unit allotment" for districts which had fewer than 1,000 students and which contained at least 300 square miles. California's "necessary small school" legislation also employed isolation criteria with a maximum enrollment of 100 in an elementary district and 75 students per grade in secondary schools. In Colorado, the "attendance entitlement" was adjusted for "small attendance centers," elementary schools with fewer than 150 pupils and secondary schools with less than 175, provided that such schools must be 20 or more miles from the nearest other school of the same grade level. In Kentucky, schools had to have fewer than 100 pupils and had to meet isolation criteria based on distance and/or travel time to the nearest other school. Schools in Oregon could also qualify for supplemental funding based on a combination of size and distance to the next school, using enrollment of 100 students (K-8 or 9-12) and a distance factor of 10 miles for elementary and 15 for secondary. Montana's low enrollment formula in 1980 applied only to isolated elementary schools of fewer than 10 students or high schools with fewer than 25.

A more recent study by Self (1991) included a listing of size criteria identified by various research-related individuals and organizations, rather than those used specifically by states for funding small schools. He noted (p.

22) that "a commonly accepted enrollment criterion is 300 or fewer (Swift, 1984; Schneider, 1980) ." Sher and Tompkins (1976) were cited for their definition of small "as any elementary school which supports not more than one classroom per grade level with an average of 20 pupils per grade and any high school with a graduating class of fewer than 100 pupils" (Self, 1991, p. 22). A number of research reports from Educational Research Service categorize school district data by size, with those enrolling fewer than 2,500 students as the smallest category.

In 1992, Gold, Smith, Lawton, and Hyary edited a summary of public school finance programs throughout the United States and Canada. A review their report identified funding mechanisms of 13 states which were found to include provisions for supplemental funding for small and/or isolated school districts. The qualifying (maximum) size criteria ranged from less than 10 students in a Montana elementary school to 17,000 per district in Florida. Other criteria for designation, in effect, as low enrollment were less than 500 in Arizona (up to 600 for a reduced supplement); up to 1,500 in a California unified school district; less than 300 students per rural district in Colorado; Minnesota criteria of less than 400 in grades 7-12 or 20 per grade in elementary; and less than 529 pupils per district in Oklahoma.

There are a number of problems associated with the establishment of a size criterion. White and Tweeten (1973) stated that "by ignoring transportation costs, past studies have provided misleading guidelines for optimal school district size, especially for rural areas" (p. 46). They noted that optimal size is determined by "tradeoffs between internal schooling economies and transportation diseconomies" (p. 45). Another author, Hickey (1969), agreed that size was not an absolute. He said that situational variables have a profound influence on size/quality relationships. The Washington Temporary

Special Levy Study Commission (1971) found that size was of much less importance to elementary programs than it was to secondary programs. It appears that those states which do provide supplemental aid to small schools have often not relied on studies of optimal size. As Swift noted in 1978 (pp. 16-17),

> based on communications with representatives of many of the states which recognize small schools or small districts, the rationale for a particular recognition [of size], with one notable exception [Florida], appears to be nebulous--or the rationale is lost in antiquity. The step function and refinements thereof which are used in several states are founded in the works of Mort (1924 and 1933) and McLure (1947). . . . More typical, however, are responses such as:
>
> It is historical. I cannot defend it.
>
> There are no data. There is no rationale. But the figures appear reasonable.
>
> We've always done it this way.
>
> and even
>
> They came from heaven. We cannot support them.

State Policies and Programs Relative To Low Enrollment Schools

While a considerable number of works have reviewed the previously cited problems of small schools, suggested actions to solve those problems are even more numerous. Bass (1980) noted four major types of activity which had been frequently proposed as solutions to small school problems: interdistrict cooperation, formation or expansion of intermediate or regional education agencies, increased state aid, and school district consolidation or reorganization (Hooker & Mueller, 1970a, Tompkins, 1977). In more recent years, the advent of distance learning technologies (from computer networks to compressed video on fiber optic lines or satellite transmission) has provided additional strategies for dealing with curricular and staffing issues. In 1991, Self identified four "conceptual bases state policymakers may use in dealing with small rural school districts" (p. 7). Self noted that these "bases lead to

actions which (1) provide financial support to all small school districts, (2) support some small school districts, (3) eliminate the presence and operation of small school districts, or (4) do not consider small school districts as a distinct class eligible for separate treatment" (p. 7). Bass and Verstegen (1992) referred to these bases as sparsity, geographical isolation, intolerance, and neutrality, respectively. The first two provide financial support for low enrollment districts, the first leading to assistance for all districts which meet the established size criterion and the second providing supplemental funding only to those districts which meet criteria for both small size and isolation. Kansas policies relative to low enrollment school districts obviously fall within the former conceptual base. Each of these two bases is considered in the following portion of this review.

Sparsity. Garms, Guthrie, and Pierce (1978) defined "sparsity aid" as the allocation of additional funds per pupil "to compensate for the higher costs in small and sparsely settled rural districts" (p. 409). For this study, that definition will be accepted, with the understanding that all low enrollment school districts, those which have fewer students than the statutory limit for such eligibility, would receive such funding, regardless of location or other geographical factors. In 1982, Monk reported that small school districts were faced with two choices. They must either spend greater amounts per pupil, and seek the necessary additional funding sources, or accept the inevitable more limited educational offerings. Bass and Verstegen noted that

> for many poor rural school districts that do not have the ability to raise additional local revenues, fiscal freewill is a cruel illusion, as Justice Thurgood Marshall noted in the landmark *Rodriguez* case. If these rural schools and districts are to provide equal educational opportunities for all students, state finance systems

must provide them with additional support to compensate for the elevated costs of providing a minimum education (p. 17).

In his 1991 study, Self identified eight states which provided supplemental revenue to all small school districts within their boundaries. Those states were Kansas, Montana, Nevada, North Dakota, Oklahoma, Pennsylvania, South Dakota, and Wyoming. The size criteria for these states were noted earlier in this report and will not be repeated here. The mechanisms for providing additional funding ranged from higher per-pupil weighting factors for low enrollment districts to guarantees of minimum funding and/or staffing for the smallest schools.

Geographical isolation. Even among those who support the concept of providing supplemental revenue to small schools, there are individuals who do not favor the policy of providing additional state funding to every small district. Hooker and Mueller (1970b) noted that, while some legislatures provided higher levels of financial support for small schools, the additional aid was given "under conditions that have subsidized ineffective and inefficient administrative units" (p. 2). Swift (1978) said that "it appears inefficient to provide large amounts of size adjustment money to many of the districts with low enrollment and to districts with small schools located near larger attendance centers" (p. 95). Johns (1975) agreed with that point of view.

> Experience with state formulas that make provision for the extra costs due to sparsity has shown that great care should be exercised to avoid providing financial incentives for school districts to maintain unnecessary small schools. The operation of unnecessary small schools wastes school funds and prevents pupils from having access to the educational programs they need (p. 22).

In a 1977 study by the Minnesota Department of Education, it was stated that additional state aid to all small schools would be ineffective unless

unreasonable amounts of state aid were supplied and would provide a disincentive to further reorganization. On the other hand, the study found that consolidation would not be possible in sparsely populated regions and cooperative programs to share services would be of limited value in those same areas. The Department therefore recommended a geographical isolation factor which would have several characteristics.

> (1) It should be limited to districts which, because of their small size, are unable to provide a high quality educational program under the existing financial system.
> (2) It should further be limited to districts which are so isolated that consolidation would not be practical.
> (3) It should provide the districts classified as small and isolated with enough funds to finance educational opportunities of the same quality as the opportunities available in larger districts (p. 13).

Another study, sponsored by the Northwest Regional Educational Laboratory and conducted by Ford, Hite, and Koch (1967), had similar recommendations.

> 1. State Boards of Education and State Departments of Education should define criteria for deciding if a small rural high school is 'remote and necessary.' The criteria should include such considerations as geographic location, topography, climactic conditions and proximity to other high schools in the geographic area.
> 2. Surveys should be made by State Departments of Public Instruction to determine which small rural high schools meet the criteria for being considered 'remote and necessary.' Those schools which satisfy the criteria should be designated 'remote and necessary' for purposes of State Department of Public Instruction evaluation and financial support.
> 3. Small rural high schools which do not meet the criteria to be designated 'remote and necessary' should be encouraged through all possible means to consolidate as quickly as is feasible (p. 36).

Others, including Sher (1978) and Morphet, Kingsley, and Howsam (1951), have supported an alternative to consolidation of small schools which were not deemed to be geographically isolated. They recommended that additional

funding be supplied by the state for the isolated districts and that small, non-isolated districts be allowed to continue in operation if the residents of such districts were willing to provide additional local support.

> The law should provide that if . . . inadequate districts choose to continue as separate districts . . . the taxpayers of those districts would bear the extra expense involved in providing adequate school services and facilities for the children of the district.
>
> Under no conditions should the taxpayers of the entire state be expected to care for the extra expense of operating inefficiently organized districts nor should the children in those districts be penalized because of the decisions of the electorate to continue such districts (Morphet, Kingsley, & Howsam, 1951, p. 320).

Works by McLure (1951), the American Association of School Administrators Commission on School District Reorganization (1958), Hooker and Mueller (1971), Johns and Morphet (1975), Honey (1978), and Sher (1978) also seemed to support the idea of a geographical isolation factor to distinguish the small school districts eligible for supplemental support from the state from those expected to furnish such revenue from local sources. According to Bass (1980), "the geographical isolation factor was regarded as a solution which did not entail the extremely high cost of additional state aid to all small schools, did not encourage continued operation of unnecessary small schools, did not force consolidation of small districts in disregard of local choice, and did not perpetuate or condone the inadequate programs in small isolated districts" (p. 20).

Self, in his 1991 study, found that 15 states based their funding of low enrollment schools solely on the "revenue-some" (geographical isolation) policy base which required those districts to meet criteria for both small size and isolated location. Those states identified by Self were Alaska, Arizona,

Arkansas, California, Colorado, Florida, Georgia, Idaho, Louisiana, Maine, Nebraska, New Mexico, Oregon, Texas, and Washington. In his 1980 study, Bass identified 20 states which had incorporated geographical isolation factors in their school funding systems. His list also included Kentucky, Minnesota, Montana, North Carolina, Pennsylvania, South Dakota, and Utah but did not include Arizona and Louisiana. Bass classified the various isolation criteria as (1) density, in which low total or student population density is a determining factor in determining isolation; (2) distance, which incorporates mileage or travel time to neighboring schools; (3) state determination, where a state body has the authority to consider multiple criteria for isolation; and (4) formulas, in which multiple isolation factors are mathematically incorporated into the funding system. As with the sparsity states, the size criteria for many of these states have already been presented in a previous section.

Conclusions

From the review of the literature, it has been concluded that:

1. there is no consistent definition of "small" as the term applies to schools or school districts;
2. small schools and/or school districts will generally incur higher per-pupil costs if they fulfill an expectation to provide an educational program equivalent to that offered in larger districts;
3. probably the most significant factor in such higher per-pupil costs is the lower pupil-teacher ratios encountered in the smaller schools;

4. state policies reflect varied approaches to dealing with small schools, from intolerance and forced consolidation to the provision of supplemental funding to all qualifying districts; and
5. many states which provide such funding do so only to school districts which meet criteria for both size and isolation.

Qualitative Method and Findings

The qualitative design for this study was focused on the perceptions of public school superintendents regarding the low enrollment weighting, as well as the increasingly broader topics of the Act and of public school funding in Kansas. This portion of the project was conducted by Dr. Bass. An interview protocol was developed through consultation and testing with other researchers at Oklahoma State University and with public school superintendents in Oklahoma. The protocol began with a broad request ("Tell me about school funding in Kansas.") and then included sequential questions dealing with more detailed elements of the funding system, including the factors that could be cited to justify supplemental funding to smaller school districts, the degree to which the low enrollment factor assisted those smaller districts, and the district size at which economies of scale might supercede the need for low enrollment funding.

A random sample of 64 school districts was selected for the qualitative portion of the study. The initial plan was to schedule interviews at ten sites in various regions of the State of Kansas. Superintendents of the sample districts were contacted to determine their willingness to be interviewed and to drive to a regionally central site, as well as their availability for an interview during the month of July. It was originally determined that a sufficient number of the superintendents in seven of the ten areas could be assembled at central sites for interviews during July. Subsequently, several superintendents around one site indicated that they would not be available on the assigned day and interviews at that site were then postponed. During the week of July 18-22,

1994, interviews were conducted at two sites in western Kansas. Interviews in four locations in eastern Kansas were scheduled for the following week, July 25-29. A total of 34 superintendents, from the initial sample of 64 districts, were interviewed during that time.

The initial intent was to schedule interviews at the remaining regional sites during the early fall. However, preliminary analysis of the data from the initial round of interviews indicated to the consultant that further interviews would not provide sufficient additional data to support the cost and time involved, both for the interviewer and the interviewees. The analysis of data already obtained revealed that relatively little information had been obtained regarding substantive views on the focus of this project, a low enrollment weighting criterion that would be seen as having a rational basis. In other words, for whatever reason, the interviewees tended to not share specific opinion regarding the size of school district which would justify the low enrollment weighting. The superintendents' perceptions on most other matters relating to school funding were seen as consistently related to their districts' sizes, with virtually no deviation within groups. On the one issue that did not follow that pattern, the local option budget (LOB), the superintendents were almost evenly divided for and against that factor, even though district size was not a predictor of such opinions. Because of the paucity of data obtained relative to the low enrollment weighting, the consistency of data on other elements of the funding system, and the even split on LOB, it was decided that interviews with the other 30 superintendents would not appreciably change the findings from this portion of the study, those findings summarized below.

Of most particular interest to the scope of this study, the superintendents were asked to indicate the maximum size (or size range) of school district that would provide a sufficient number of students so as to no longer justify a low enrollment weighting for supplemental income to compensate for diseconomies of scale. Few of those interviewed provided a specific answer to this question. A typical response was "I really don't have any basis to answer that." Another superintendent indicated that "it wouldn't be appropriate for me to tell you that because that's what you've been hired to tell us." A third type of response dealt with the fear that one's opinion might become public knowledge, despite the interviewer's assurances of confidentiality and anonymity. "If my neighbors found out that I had recommended that they no longer receive [the low enrollment weighting], they'd never talk to me again." Of those who did indicate what the size criterion ought to be, the responses varied from a low of "about 200" to a maximum "about where its at, 1,900." One individual said that the size criterion which defined "small," "depends on perspective. Three hundred is a pretty small school . . . 300 in a K-6 school seems to be pretty efficient." He further noted that, since he had spent all of his years in education in "very small schools," "1,900 seems to be a pretty big school." Another superintendent kept making a different point, noting that the question ought to be "What size is too small?" That individual thought that there ought to be "at least 150 to 200 [students in a school] to be reasonable."

When asked to cite the factors that could be used to justify a low enrollment weighting, the superintendents from the smaller school tended to cite factors similar to those already reported in the review of the literature.

"Even though we're small, we must offer to our kids what other people have to offer. . . . There's certain things that must be offered to be competitive . . . There are higher costs, naturally, if we have fewer kids in what we have to offer; then the price is going to be higher." "If we're going to offer advanced science or something, we're not going to have over eight or ten [students in the class] . . . They'd have several sections [in a larger school]." "We probably have higher administrative costs for the number of kids we have to administer but we have the same demands on us." "There's just no way to spend on a comparable basis in a small school because your . . . offering the same things . . . at a higher cost basis."

The superintendents in larger districts (over 1,900) were less willing to identify factors that would justify the low enrollment or qualified their responses by indicating that such factors only justified aid to much smaller school districts than currently qualify under the low enrollment weighting. Even so, they were still reluctant to recommend a specific size criterion, simply indicating that it was "somewhere below 1,900."

In only one interview did a superintendent provide specific data relative to the issue of geographic isolation factors. Most of those interviewed asked questions about the use of such factors rather than provided opinions about the value (or lack thereof) of such use. In the one interview that did turn to a discussion on isolation, the topic was initiated by the superintendent who noted that "some districts are choosing to be small by choice; you know, saying that, by god, we're going to keep our school." He questioned "should the state pay for that? . . . I don't know."

When the focus of the interview shifted to the broader topics of Kansas school finance, there was more substantial agreement among all superintendents. This was most true when they addressed the per-pupil funding guarantee. Nearly every superintendent interviewed said that one of the biggest problems encountered was the lack of increase in the $3,600 figure. Many, including those in the larger districts, indicated that their school districts would be financially secure if that amount had been raised, with $4,000 and $4,200 cited most often as "more appropriate funding levels." One superintendent noted that "we wouldn't even be in court if the legislature had raised it to $4,000."

The one issue upon which the superintendents disagreed but which did not split according to size categories was the local option budget (LOB). The opinions were nearly evenly split on whether or not the LOB was a good provision. Those in favor cited local control and the "opportunity to pursue educational excellence" as favorable reasons to have the LOB. Opponents most often noted the potential for statewide inequities in per-pupil funding as the major criticism of the LOB. Even some superintendents whose districts' voters had approved the LOB expressed opposition to the funding mechanism, preferring to have a "more equitable and adequate" level of funding guaranteed by the state for all districts.

In summary, the qualitative data collection failed to provide the consultants with persuasive evidence relative to the appropriate, or acceptable, size criterion for the low enrollment weighting factor. Among the few who did provide responses relevant to that point, most superintendents in currently eligible districts did not want to change the existing 1,900 criterion

and those in districts with more than 1,900 students tended to report a need to lower the figure but not to have a specific number or range to recommend. Superintendents in districts receiving low enrollment weighting also agreed that the funding level from that source was appropriate and allowed their districts to provide appropriate and effective educational programs while those in larger districts perceived the low enrollment funding as distributing too much money to too many school districts.

Quantitative Method and Findings

As noted earlier, the analysis of the data was done in response to a request by the Legislative Coordinating Council of the State of Kansas for a statistical analysis, utilizing commonly-accepted methodologies, to ascertain the magnitude of the relationship between school district enrollment size and expenditure levels, to determine the extent to which economy of scale accounts for such relationship[1] and to document a rational basis for providing additional revenue to low enrollment school districts.[2] Further, it was stipulated that the report shall contain an articulation of any rational basis or justification for providing additional revenue to low enrollment school districts.[3]

A stipulation implied in the Request for Proposal, but not explicitly stated in the Agreement, was that data reflecting past legislative history should not be used to analyze the problem. The rationale for this stipulation was that the findings would be a direct reflection of the existing system.

Statement of the Problem

Low enrollment weighting recognizes and compensates for the higher per-pupil fixed and operating costs necessary to provide an educational program in low enrollment school districts of less than 1,900 enrollment in the State of Kansas.

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[1]Agreement, Legislative Coordinating Council of the State of Kansas and Consultants, April 1994, Scope of Work by Consultants, Part (c).

[2] Agreement, Section 1, 1.1 (2).

[3] Agreement, Section 1, 1.3.

Purpose of the Data Analysis

The purpose of the data analysis is to (1) ascertain the magnitude of the relationship between school district enrollment size and expenditure levels; (2) determine the extent to which economy of scale accounts for such relationship; and (3) document a rational basis for providing additional revenue to low enrollment school districts.

Research Question(s)

1. Is there a relationship between school district enrollment size and expenditure levels?
2. Are differences in school district expenditures due to enrollment size or to other factors?
3. At what school district enrollment size does economy of scale account for a difference in expenditures?

Methodology

Data operationalization procedures involved translating the research questions into data that could be measured. The operationalization steps were: define the area of Kansas data to be considered for variable selection; select the data; import the data and set up data files; and analyze the data.

Data Selection

Five years of Kansas school district data were selected for this examination. School finance, certified and non-certified personnel, and other

school related data for the 304 school districts for the years 1989-90, 1990-91, 1991-92, 1992-93, and 1993-94 were selected. Variable data included the following:

5 Years	(1989-90 to 1993-94)	School Finance Data
5 Years	(1989-90 to 1993-94)	Certified Personnel
5 Years	(1989-90 to 1993-94)	Non-Certified Personnel
2 Years	(1991-92 & 1992-93)	Salaries (Certified Personnel)
5 Years	(1989-90 to 1993-94)	FTEE Enrollment
5 Years	(1989-90 to 1993-94)	Assessed Valuation
5 Years	(1989-90 to 1993-94)	Pupils Transported over 2.5 miles
5 Years	(1989-90 to 1993-94)	State Totals
1 Year	(1993-94)	Land Area in Square Miles
1 Year	(1993-94)	Number of Attendance Centers

Data analysis included the statistical procedures of correlation, regression, descriptive, normality plots, and scatter plots. Problems of skewness, outliers, and non-linearity of variable data had to be recognized and addressed while exploring the data. Descriptive statistics such as mean and median were computed by student weighting. If a school district did not have five years of data, it was omitted from many of the analyses. The greatest statistical problem encountered was in the non-normality of many of the variables and the possibility of distorted outcomes when examining relationships.

School districts were not named throughout the analysis. Even though five years of data for the 304 school districts were incorporated, school district identification was by number. In essence, this was a blind analysis of the data.

It should be noted that the quality of the data records and reports supplied by the Kansas State Board of Education were of the highest degree of any that a state could provide. Dale Dennis, Deputy Commissioner of

Education, and Madelyn Litz of the State Board of Education, are to be commended for their remarkable data records.

Data Analysis

The analyses of the data took into consideration the implied stipulation of not using data that reflected past legislative history in examining the problem. The variables that would have the strongest relationship to past legislative history are Total Expenditures and Transfers per Pupil and salary related expenditures. The resulting challenge was to identify variables that were not a reflection of past legislative history.

The statement of the problem guided the direction for the examination of the data.

> Low enrollment weighting recognizes and compensates for the higher fixed and operating costs per pupil necessary to provide an educational program in low enrollment districts.

Such costs include:

1. Basic educational programs and services,
2. Repair and maintenance of facilities,
3. Administration,
4. Support and instructional staff, and
5. Equipment and other overhead.

After excluding Total Expenditures and Transfers per Pupil and salary related areas, and after examining the statement of the problem, it was concluded that the area of concentration for the analysis should be in the following three areas:

I. Operations and Maintenance,

II. Certified Personnel, and

III. Non-Certified Personnel.

Even though the major concentration of the analysis was to be in those three areas, an overview of the whole had to be obtained to understand the parts of the whole. Operations and maintenance, as all the parts, acts in concert with the whole. It is believed that recommended changes to any part of the whole will have a rippling effect, therefore, a study of one part or of several parts cannot be conducted in isolation.

Overview of the Data Analysis

The data analysis will first address the total view of the state followed by a breakdown of Operations and Maintenance, which received the most concentrated effort of this study. Certified and Non-Certified personnel were investigated to arrive at an equivalent educational program offered by a majority of the school districts across the state. The quantitative data section will conclude with a summary of the findings. The recommendations from this analysis are included, with those from the qualitative analysis, in the final section of this report.

State Data

Total Expenditures and Transfers

In 1992-93 and 1993-94, Total Expenditures and Transfers included General and Local Option Budget expenditures. Of the 304 Kansas school districts, 105 or 34.5 percent, exercised the Local Option Budget (LOB) in 1992-93 and 133 (44%) exercised the LOB in 1993-94. The 1992-93 Total Expenditures and Transfers per pupil ranged from $3,061 to $10,051 with a mean of $4,493. The 1992-93 expenditures per pupil before the LOB was

included ranged from $3,061 to $8,181 with the state average of $4,267. In 1993-94, the average Total Expenditures and Transfers per pupil was $4,673 with a range of $3,724 to $10,471. Presented in Table 1 is a five year overview of Total Expenditures and Transfers per pupil from 1989-90 to 1993-94.

Table 1
Total Expenditures & Transfers Per Pupil
1989-90 to 1993-94
Kansas School Districts

Year	$ Per Pupil	Range	
1993-94:			
With LOB	4,673	3,724	10,471
Without LOB	4,338	3,671	8,456
1992-93			
With LOB	4,494	3,061	10,051
Without LOB	4,267	3,061	8,181
1991-92	4,090	2,725	10,707
1990-91	3,802	2,461	10,043
1989-90	3,695	2,350	8,392

Data Source: Kansas State Board of Education, 1989-90 to 1993-94 Data

For the purpose of this overview of the state, but not of the total study, per pupil expenditures will reflect Total Expenditures and Transfers less Transfers (see Appendix A for a list of transfer accounts). Presented in Table 2 and Table 3 are the categories that comprise the expenditures excluding the transfer accounts for 1992-93[4] and 1991-92. The average per pupil amount for Transfers for 1992-93 was $597, therefore, the per pupil expenditure amount for 1992-93 would be $4,494 less the $597 for Transfers or $3,897.

[4] At the time of this part of the study, 1993-94 data were not available.

I. Categories of Per Pupil Expenditures - 1992-93 (Total Expenditures & Transfers less Transfers) ($4,494 - $597 = $3,897)

Table 2
Per Pupil Expenditures in Kansas School Districts, by Category, in 1992-93

Expenditure Category	Per Pupil Expenditures	Percent of Total
1. Instructional	2,395	61.5%
2. Operation & Maintenance	585	15.0
3. School Administration	304	7.8
4. General Administration	168	4.3
5. Instructional Support	161	4.1
6. Student Support	144	3.7
7. Other Support	92	2.4
8. CS, SA, A&E	48	1.2
Totals	3,897	100.0

Note: CS (Community Service Operations), SA (Student Activities), A&E (Architectural and Engineering Services).
Data Source: Kansas State Board of Education, 1992-93 Data

Total Expenditures and Transfers per Pupil in 1991-92 included General Expenditures and no Local Option Budget. The per pupil amount ranged from a low of $2,725 to a high of $10,707 with a state average of $4,409. The per pupil expenditures less transfers and the category amounts are as follows:

II. Categories of Per Pupil Expenditures - 1991-92 (Total Expenditures & Transfers less Transfers) ($4,090 - $534 = $3,556)

Table 3
Per Pupil Expenditures in Kansas School Districts,
by Category, in 1991-92

Expenditure Category	Per Pupil Expenditures	Percent of Total
1. Instructional	2,199	61.84
2. Operation & Maintenance	527	14.81
3. School Administration	284	7.97
4. General Administration	160	4.51
5. Instructional Support	142	3.99
6. Student Support	123	3.45
7. Other Support	79	2.23
8. CS, SA, A&E	43	1.20
Totals	3,556	100.0

Data Source: Kansas State Board of Education, 1991-92 Data

Operations and Maintenance as a Percentage of Total Expenditures Less Transfers

In 1991-92 and 1992-93, the category of Operations and Maintenance was approximately 15 percent of Total Expenditures less Transfers. Instructional and Administration categories were approximately 74 percent of the expenditures.

Relative to the expenditures that remain after Instructional and Administration have been subtracted, Operations and Maintenance expenditures represent approximately 57 percent of the remaining amount as shown below.

Year	Expenditures	-	(Inst & Admin)	=	Difference
1991-92	$3,556	-	$2,643	=	$ 913
1992-93	$3,897	-	$2,868	=	$1,029
Year	**(Oper & Main)**	**/**	**Difference**	**=**	**Percent**
1991-92	$527	/	$913	=	57.72%
1992-93	$585	/	$1,029	=	56.85%

Expenditures Examined by Account

Expenditures of a school district can be examined by accounts such as salaries, insurance, purchased professional and technical services, purchased property services, supplies, and property equipment and furniture.

In 1992-93, salary related accounts accounted for approximately 81 percent of Total Expenditures and Transfers less Transfers with certified salaries accounting for 59 percent of the total. Arrayed in Table 4 are the different accounts that comprise expenditures and the related per pupil amount.

Table 4
Expenditures Per Pupil (Total Expenditures & Transfers Less Transfers), By Account, 1992-93 & 1991-92

Account	Per Pupil Expenditures		Percentage of Increase (Decrease)
	1991-92	1992-93	
Salary Related:			
a. Certified Personnel	2,143	2,295	7.0
b. Non-Certified Personnel	457	486	6.3
c. Insurance (Employee)	119	134	12.6
d. Social Security	198	212	7.0
e. Other	39	45	15.3
Purchased Professional & Technical Services	30	38	26.6
Purchased Property Services	69	93	34.7
Other Purchased Services	70	73	4.2
Supplies	304	338	11.2
Property Equipment & Furniture	62	107	72.5
Other	22	28	27.3
CS, SA, A&E	43	48	11.6
Total	3,556	3,897	9.6

Data Source: Kansas State Board of Education, 1991-92 & 1992-93 Data

The account Supplies includes general supplemental teaching supplies, textbooks, miscellaneous instructional supplies, books and periodicals (not textbooks), audiovisual and instructional software, general and school administration supplies, and general supplies for operation and maintenance (heating, electricity, and miscellaneous).

While Property Equipment and Furniture had an increase of 72.5 percent from 1991-92 to 1992-93, Capital Outlay, an account under Transfers, had a decrease of 79.8 percent. The percentage change in the Property Equipment and Furniture account is important to a later discussion concerning Operations and Maintenance.

It should be noted that in 1992-93, $37 million was allocated for Property Equipment and Furniture under general expenditures, plus an additional $9 million under the local option budget for a total of $46 million compared to a total of $26 million in 1991-92. Arrayed in Table 5 is the

Table 5
Property Equipment & Furniture By Account Category,
Percentage Increase, 1992-93 - 1991-92

Category Account		1992-93 Gen	1992-93 LOB	1992-93 Total	1991-92 Total	% Increase
1000	700	$21,597,297	$4,062,830	$25,660,127	$11,310,446	126.9 %
2100	700	532,796	185,440	718,236	451,581	59.0 %
2300	700	1,548,920	55,332	1,604,252	1,025,017	56.5 %
2600	700	8,032,896	112,327	8,145,223	6,268,182	29.9 %
2200	700	1,683,676	342,574	2,026,250	1,839,252	10.2 %
2800	700	2,012,693	4,150,161	6,162,854	4,043,692	52.4 %
2400	700	1,607,112	84,978	1,692,090	1,337,212	26.5 %
Total		$37,015,390	$8,993,642	$46,009,032	$26,275,382	75.1 %

Data Source: Kansas State Board of Education, 1991-92 & 1992-93 Data

Property Equipment and Furniture account for the two year period, with 1992-93 divided by general and local option budget amounts.

Operations and Maintenance as the Base Element of the Study

Operations and Maintenance has been chosen as the base element of this study for the following reasons:

(1) A reference point has to be chosen that is relative to all the school districts in the state.

(2) The reference point should not reflect past legislative history of the funding formula.

(3) The reference point needs to be one that is free of the influence of local choice and local wealth.

(4) The reference point must remain constant over time.

(5) The reference point needs to be a necessary function of the basic school operation.

Operations and Maintenance was chosen as the base element of the study because it is a category that is relative to all the school districts, it may or may not reflect past legislative history of the funding formula, it may or may not be influenced by local wealth, it may remain constant over the five years to be examined, and importantly, it is a necessary function of the basic school operation. Even though Operations and Maintenance represents only 15 percent of total expenditures, it represents 58 percent of the expenditures that remain after Instructional and Administration categories have been removed.

Operations and Maintenance (O&M): Introduction

Over a five year period, 1989-90 to 1993-94, many of the 304 school districts of Kansas have recorded large expenditures for different Operations and Maintenance categories while other school districts have recorded zero dollars ($0.00) for the same services. In some school districts, heat and electricity expenses have consumed a major portion of the non-salary operations and maintenance building costs while in other school districts it has been a small percentage.

Expenditures for Operations and Maintenance (O&M) of school buildings consists of 21 categories with four of the categories salary related. The categories that have the strongest influence on the variation in O&M costs per pupil among the school districts are Non-Certified O&M Salaries, Repair of Buildings, Electricity, Equipment and Furniture, Rentals, Heating, and Repairs and Maintenance.

In 1993-94, 193 school districts (63 percent) recorded Repair of Buildings as an O&M expenditure ranging from a low of $2 per pupil to a high of $1,103. In 1989-90, 70 percent of the school districts listed Repairs and Maintenance as an expenditure with costs ranging from ten cents ($0.10) per pupil to a high of $207, compared to 89 percent of the districts in 1993-94, with per pupil costs ranging from sixty cents ($0.60) to a high of $817.

From the analysis of five years of O&M data, there appears to be a strong indication that school districts that have small O&M expenditures per pupil, relative to the other school districts in the state, spend small per pupil amounts or zero amounts of money in many of the possible 21 categories.

Also, from the following data and tables, one can observe that school districts of the same size can have vastly different building expenditures per pupil and school districts of different sizes can have the same per pupil building expenditures.

After examining the data, it became evident that total O&M could not be used as the basis of the examination and that the major task would be to pinpoint an O&M category that did not reflect past Total Expenditure and Transfer history and that was not related to local wealth and school district size. In summary, to pinpoint an O&M category that would represent an unbiased measurement of O&M costs among all the school districts of the state.

In the following tables and graphs, information has been presented to (1) illustrate the variation in O&M expenditures per pupil among the school districts; and (2) to illustrate the relationship of O&M with local wealth, land area, school size, and Total Expenditures and Transfers.

Total Operations and Maintenance (O&M) Per Pupil

In 1993-94, the average per pupil cost for Total O&M expense was $546 compared to $499 in 1989-90. The minimum per pupil O&M expense was $211 in 1989-90 and $212 in 1993-94, compared to the maximum amount expended per pupil of $1,350 in 1989-90 and $1,683 in 1993-94. Total O&M expenditures represented 13.5 percent of all Expenditures and Transfers in 1989-90, 13 percent in 1992-93, and 13.1 percent in 1993-94. As already noted, O&M represents 15 percent of Total Expenditures and Transfers less

Transfers and 58 percent of the expenditures that remain after Instructional and Administration categories have been removed.

Arrayed in Table 6 are the per pupil averages for Total O&M expenses for 1989-90 to 1993-94 and, in Table 7, the Non-Salary Related O&M per pupil expenses for the same period.

Table 6
Total Operations and Maintenance,
Average Cost Per Pupil,
1989-90 to 1993-94

	89-90	90-91	91-92	92-93	93-94	5 Yr Avg
Average	$499	$512	$527	$585	$609	$547
Median	$469	$498	$500	$541	$564	$511
Maximum	$1,350	$1,324	$1,361	$1,515	$1,673	$1,239
Minimum	$211	$189	$191	$222	$250	$212
Enrollment	407,882	414,593	424,737	431,321	437,208	422,059
Number of Districts	303	303	304	304	304	303

Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

Salary related O&M costs were 50.9 percent of Total O&M costs in 1989-90, 48.8 percent in 1992-93, and 47.8 percent in 1993-94. Non-Salary Related O&M costs per pupil were $272 for the five year average, $318 in 1993-94, and $245 in 1989-90. The 1993-94 per pupil range for Non-Salary Related O&M costs extended from a low of $122 to a high of $1,417. Arrayed in Table 7 are the Non-Salary Related O&M costs per pupil for the years 1989-90 to 1993-94.

Table 7
Non-Salary Related Operations and Maintenance,
Average Cost Per Pupil, 1989-90 to 1993-94

	89-90	90-91	91-92	92-93	93-94	5 Yr Avg
Average	$245	$244	$257	$299	$318	$272
Median	$210	$211	$217	$234	$246	$230
Maximum	$1,041	$1,128	$876	$1,213	$1,417	$815
Minimum	$ 89	$ 0	$ 81	$104	$122	$ 95

Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

In 1993-94, the maximum per pupil amount of $1,417 for Non-Salary Related O&M costs was 5.8 times greater than the median ($246) and 11.6 times greater than the minimum ($122). For the five year average, the maximum average cost per pupil ($815) was 3.5 times greater than the median ($230) and 8.6 times greater than the minimum ($95).

There are two reasons for discussing the ratio of the maximum to the median. The first is to illustrate the different results for the same comparisons for one year of data compared to an average of five years of data (5.8 to 3.5 and 11.6 to 8.6). The second reason is to bring attention to the difference in the average per pupil amount expended on buildings that house 50 percent of the children in relationship to the highest per pupil amount expended.

Increasing Participation

Starting with 1990-91, a greater percentage of school districts participated in a greater number of the 21 operation and maintenance categories. In 1989-90, 49 percent of the school districts provided employee

insurance for non-certified operation and maintenance employees compared to 70 percent in 1993-94. In 1989-90, 92 school districts recorded zero dollars ($0.00) for Repair and Maintenance; in 1993-94, that number declined to 32 school districts. The 21 O&M categories are listed in Table 8 by the following category numbers.

120	Non-Certified Salaries	520	Insurance
210	Insurance (Employee)	590	Other (Purchased
220	Social Security	610	General Supplies
290	Other (Employee Benefits)	621	Heating
300	Professional Tech Services	622	Electricity
411	Water/Sewer	626	Motor-Fuel-Not-Sch Bus
420	Cleaning	629	Other (Energy)
430	Repairs & Maintenance	680	Miscellaneous Supplies
440	Rentals	700	Property (Equipment & Furniture)
460	Repair of Building	800	Other (Property Service)
490	Other (Purchased Property Services)		

Category 300 represents Professional Technical Services. From Table 8, one can observe that on an average, 40 percent of the school districts participated in the purchase of Professional Technical Services over the five year period. From Table 9, one can observe that in 1989-90 the per pupil amount ranged from ten cents ($0.10) to $175 for the 113 school districts participating in this service and increased to $3.00 to $301 per pupil in 1993-94 for 134 participating school districts.

Table 8
Operations and Maintenance,
1989-90 To 1992-93

Percentage of School Districts With O&M Expenditure by Category

Year/ Category	120	210	220	290	300	411	420
89-90	100%	49%	79%	59%	37%	94%	33%
90-91	100%	63%	93%	77%	39%	96%	58%
91-92	100%	67%	96%	79%	39%	96%	61%
92-93	100%	69%	96%	79%	41%	96%	62%
93-94	100%	70%	97%	82%	44%	97%	62%
89-94 5 Year	100%	64%	92%	75%	40%	96%	55%

Year/ Category	430	440	460	490	520	590	610
89-90	70%	25%	53%	44%	64%	34%	88%
90-91	86%	35%	60%	48%	71%	47%	95%
91-92	87%	38%	59%	44%	72%	48%	96%
92-93	88%	36%	63%	44%	71%	46%	97%
93-94	89%	36%	63%	48%	71%	48%	98%
89-94 5 Year	84%	34%	60%	46%	70%	45%	95%

Year/ Category	621	622	626	629	680	700	800
89-90	99%	99%	22%	31%	29%	57%	34%
90-91	99%	99%	39%	33%	31%	68%	48%
91-92	99%	99%	43%	29%	30%	68%	46%
92-93	99%	99%	46%	30%	25%	74%	48%
93-94	99%	99%	46%	28%	29%	75%	46%
89-94 5 Year	99%	99%	39%	30%	40%	68%	44%

Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

In Table 9, the average Total Operations and Maintenance expenditure per pupil for 1989-90 and 1993-94 can be compared by category. Note the extreme range of per pupil expenditure by category. School districts with zero expenditures for a category were omitted from the calculations in obtaining the average and the range.

Table 9
Average Operations and Maintenance Expenditure
per Pupil, 1989-90 & 1993-94, By Category

Category OPERATIONS & MAINTENANCE	89-90 $ Per Pupil	Range $ Per Pupil	# Sch Dists	93-94 $ Per Pupil	Range $ Per Pupil	# Sch Dists
120 Non-Certified Salary	*$224	$80 -$649	303	*$249	$64 -$507	304
622 Electricity	78	25 - 274	299	90	20 - 330	301
621 Heating	39	6 - 213	300	43	7 - 252	302
430 Repairs & Maint	27	.1 - 207	211	37	.6 - 817	272
460 Repair of Buildings	27	2 - 632	167	42	2 -1103	193
610 General Supplies	27	6 - 179	268	34	8 - 239	298
520 Insurance	22	.7 - 236	194	20	3 - 151	216
700 Property (Equipment/	21	4 - 419	172	22	5 - 807	227
220 Social Security	* 18	2 - 299	239	* 20	5 - 405	295
629 Other (Energy)	18	5 - 185	93	8	2 - 81	84
210 Insurance (Employee)	* 15	.2 - 168	149	* 16	3 - 119	213
490 Other (Pur Prop Svc)	14	9 - 119	133	12	2 - 474	146
800 Other (Property Svc)	14	8 - 160	103	18	3 - 583	140
300 Prof Technical Svc	11	.1 - 175	113	17	3 - 301	134
440 Rentals	11	1 - 227	76	17	3 - 886	112
411 Water/Sewer	9	.6 - 55	286	11	2 - 50	295
290 Other (Emp Benefits)	* 7	3 - 86	180	* 6	5 - 45	250
590 Other (Purchased Svc	7	4 - 46	102	10	7 - 130	146
680 Miscellaneous Suppli	7	6 - 105	87	5	9 - 112	87
420 Cleaning	4	.3 - 69	99	7	10 - 53	189
626 Motor-Fuel (Not Bus)	3	.1 - 33	66	3	3 - 161	140
Total O & M /Pupil Mean	$499	$211 -$1,350		$609	$250 - $1,673	
Expend & Transfers/Pupil	$3,695	$2,350 -$8,393		$4,673	$3,724 -$10,471	
Enrollment FTEE	407,882	72 - 43,942		437,208	74 - 45,357	

* Salary Related Operations & Maintenance Data
Data Source: 1989-90 & 1993-94 Data, Kansas State Board of Education

The expenditure range for Repair and Maintenance remains broad over the five year period. In 1989-90, the range was from ten cents ($0.10) to $270 per pupil; in 1993-94, less than one dollar ($1.00) to $817 per pupil. Due to the changing participation rates and differences in per pupil expenditures by the school districts in the 21 categories, one year of data would not have been sufficient to provide quality information about O&M.

At this point, it is evident from the data that not all the school districts participate in all the 21 O&M categories and the dollar level of those participating varies from a few cents to a thousand dollars. The question that is now raised by the data is, do school districts have greater O&M costs due to size or to level of participation? To try to answer that question, the next section examines the variation in per pupil O&M costs across school districts and across attendance centers that house a similar number of students.

Variation in Per Pupil Operations & Maintenance Costs Across School Districts And Across Attendance Centers

Per pupil Operations and Maintenance (O&M) costs vary across school districts and across attendance centers that house a similar number of students. The following examination is based on the premise that per pupil O&M costs for an attendance center that houses X number of students in School District A should be about the same per pupil costs for an attendance center that houses a similar number of students in School District B. Some variation in costs could occur due to the presence or absence of air conditioning and the physical condition of the attendance centers.

In Tables 10, 11, and 12, total enrollment is divided into three percentile groups based on the five year average of Non-Salary Related O&M costs per pupil and enrollment. Group III represents the 75 percentile and above on Non-Salary Related O&M costs per pupil. Group III consists of 66 percent of the school districts and 25 percent of the enrollment with Non-Salary Related O&M costs ranging from $319 to $815 per pupil. Group II consists of 28 percent of the school districts and 54 percent of the enrollment with O&M costs per pupil ranging from $192 to $318; and Group I, 16 percent of the school districts and 21 percent of the enrollment with costs ranging from $95 to $191 per pupil. Group I represents the 25 percentile and below. Because of school district enrollment distribution, Group I ended up with 21 percent of the five year average student enrollment instead of 25 percent.

In addition to the percentile groups, Tables 10, 11, and 12 are divided by the average number of students per attendance center for each school district. The average number of students per attendance center was calculated by dividing each school district's five year average enrollment by the respective number of attendance centers for 1993-94.

For the 69 school districts that have an average of 200 to 299 students per attendance center the Non-Salary Related O&M cost per pupil varies within groups and across groups. Over the five year period, 10 of the 69 school districts have maintained an average of $500 to $700 per student for Non-Salary Related O&M costs while 28 of the districts, that have a similar number of students per attendance center, have maintained an average cost of $200 to $299 per student.

Table 10
Non-Salary Related Operations and Maintenance Costs
Five Year Average (1989-90 to 1993-94)
By Percentiles and
By the Average Number of **Students Per Attendance Center**

	Group III ≥ 75%tile **$815-$319**	Group II 75th - 25th %tile **$318-$192**	Group I ≤ 25%tile **$191-$95**
Average # Students Per Attendance Center	Number School Districts	Number School Districts	Number School Districts
40-48	4		
50-59	9		
60-69	10		
70-79	8		
80-89	8	1	
90-99	18		
100-119	17	3	
120-129	8		
130-139	5		
140-149	10	1	
150-159	10	2	
160-169	9		
170-179	8	1	
180-189	13	3	
190-199	5	3	
200-299	36	32	1
300-399	18	17	10
400-499	2	16	4
500-599	3	7	1
600 -	1		
# Sch Dists	202	86	16
% of Sch Dists	66.4%	28.3%	5.3%
# Students	106,412	228,461	89,002
% of Students	25.1%	53.9%	21%

Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

Extracted from the previous table and presented in Table 11 are the 69 school districts that have an average enrollment of 200 to 299 per attendance center. The Non-Salary Related O&M cost per pupil was arrayed by levels of $100.

Table 11
Variations in Per Pupil Costs Across Districts
Non-Salary Related Operations and Maintenance Costs
Five Year Average (1989-90 to 1993-94)
By Percentiles and
By **200 - 299 Students Per Attendance Center**

	Group III High	Group II Medium	Group I Low	Total
Average # Students/ Attendance Center	Number School Districts ($775-$320)	Number School Districts ($307-$192)	Number School Districts ($177)	Number School Districts
200 - 299	**36**	**32**	**1**	**69**
Per Pupil Range				
$100s	0	1	1	2
$200s	0	28	0	28
$300s	14	3	0	17
$400s	12	0	0	12
$500s	7	0	0	7
$600s	1	0	0	1
$700s	2	0	0	2

Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

The 45 school districts arrayed in Table 12 have an average of 300 to 399 students per attendance center. Note the variation in the per pupil costs across the 45 districts even though they have a similar number of students per attendance center. The major question is, why would attendance centers in one school district have greater operations and maintenance costs than attendance centers in another school district when they both have a similar number of students per center?

Table 12
Variations in Per Pupil Costs Across Districts
Non-Salary Related Operations and Maintenance Costs
Five Year Average (1989-90 to 1993-94)
By Percentiles
By **300 - 399 Students Per Attendance Center**

	Group III High	Group II Medium	Group I Low	Total
Average # Students Per Attendance Center	Number School Districts ($617-$338)	Number School Districts ($304-$202)	Number School Districts ($180-$140)	Number School Districts
300 - 399	**18**	**17**	**10**	**45**
Range $				
$100s	0	0	10	10
$200s	0	12	0	12
$300s	7	5	0	12
$400s	5	0	0	5
$500s	5	0	0	5
$600s	1	0	0	1

Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

For the 45 school districts with a similar number of students per attendance center arrayed in Table 12, 10 have per pupil costs in the $100s, 12 in the $200s, 12 in the $300s, five in the $400s, five in the $500s, and one in the $600s.

A final example of the variation in O&M costs among school districts with a similar number of students per attendance center is found in Group III for centers with student population between 100 and 199. Four school districts have the same five year average enrollment per attendance center, but vary in their per pupil Non-Salary Related O&M costs from $792 to $326. The four school districts are arrayed in Table 13.

Table 13
Variation in Per Pupil Costs Across Districts
Non-Salary Related Operations and Maintenance Costs
Five Year Average (1989-90 to 1993-94)
By **146 - 147 Students Per Attendance Center** Per District

Average Number of Students Per Attendance Center	Non-Salary O&M Costs Per Pupil
146	$792
146	383
147	326
147	448

Repairs and Maintenance

Over the five year period, 1989-90 to 1993-94, 20 school districts recorded zero dollars ($0.00) for Repairs and Maintenance; and 66 school districts recorded an average of one to seventeen dollars ($1-$17) per pupil per year. The state average over the five year period was $27 per pupil.

On the other end of the continuum, thirteen (13) school districts recorded a five year average of $100 to $305 per pupil per year. The average student enrollment for these 13 school districts ranged from 84 to 679. The school district with the high of $305 per student had an average enrollment of 439; and the average enrollment for the 20 school districts that had zero expenditures for Repairs and Maintenance over the five year period was from 77 to 21,102.

Repair of Buildings

The state average cost per pupil for Repair of Buildings over the five year period was $17 (median = $2.44). School districts recorded an average of five cents ($0.05) to $347 per pupil per year on repairs. Sixty-seven (67) school districts recorded zero dollars ($0.00) on repairs and 30 school districts recorded a per pupil average of $96 to $347. As the median of $2.44 indicates, 50 percent of the students were housed in school buildings that had less than $2.44 per pupil per year expended on building repairs over the five year period.

Average Number of Students Per Attendance Center

The average enrollment per attendance center was divided into six size levels as displayed in Table 14. Sixty (60) school districts have an average enrollment of less than 100 students per attendance center, accounting for 12,960 students and 167 centers. Twelve (12) school districts have an average enrollment of 500 or more per attendance center, accounting for 83,944 students and 164 centers. In this example, the 60 school districts maintain the

Table 14
Average Number of Students Per Attendance Centers
Five Year Average (1989-90 to 1993-94)
Kansas School Districts

	Average Enrollment Per Center	Number of School Districts	Number of Students	Number of Attendance Centers
1	< 100	60	12,960	167
2	101 - 200	96	49,501	332
3	201 - 300	70	66,442	267
4	301 - 400	44	95,416	272
5	401 - 500	21	113,795	268
6	≥ 501	12	83,944	164
	Total	303	422,058	1,470

same number of buildings as the 12 school districts, but house almost six times the number of students.

The following Tables relating to attendance centers illustrate the association or lack of association between attendance center size, land area in square miles, assessed valuation per pupil, the percentage of students transported greater than 2.5 miles, and Total Expenditures and Transfers per Pupil.

The relationship between average attendance center size and school district size is strong. The rank order correlation between the two equals 0.87. If all things could be held constant, we could say that about 76 percent of the variation in attendance center size could be attributed to school district size, leaving about 24 percent related to other things. The other things could be land

area, the distance to the next school, the percentage of students transported, local wealth, local choice or a combination of all these things plus others.

In the following tables, it is the differences in the minimum and the maximum per pupil amounts that is so striking and that should be noted, keeping in mind that these tables represent a comparison of school districts that have about the same number of students per attendance center. It appears that each group contains diverse elements. The school districts in each size level appear to be as diverse as the school districts in the next level. In summary, little support will be found for why one school district size has greater O&M expenditures per pupil than another school district size.

Table 15
Operations and Maintenance Costs Per Pupil
By Attendance Center Size,
1989-90 to 1993-94

	Average Enrollment Per Center	Total O&M Per Pupil 5 Yr Avg	Minimum	Maximum
1	< 100	$768	$569	$1,239
2	101 - 200	$648	$343	$1,030
3	201 - 300	$550	$392	$958
4	301 - 400	$506	$356	$1,014
5	401 - 500	$545	$213	$657
6	≥ 501	$502	$390	$630
	Total	$547		

Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

Table 16
Non-Salary Related
Operations and Maintenance Funds Per Pupil
Five Year Average (1989-90 to 1993-94)
By Attendance Center Size

	Average Enrollment Per Center	Non-Salary O&M Per Pupil	Minimum	Maximum
1	< 100	$472	$295	$815
2	101 - 200	$395	$207	$792
3	201 - 300	$317	$177	$775
4	301 - 400	$246	$147	$617
5	401 - 500	$214	$ 95	$467
6	≥ 501	$247	$192	$381
	Total	$272		

School districts with less than 100 average enrollment per attendance center vary in O&M cost per pupil from $569 to $1,239, a 118 percent difference. Arrayed in Table 16 are the Non-Salary Related O&M costs per pupil by attendance center size.

As can be noted in Table 17, there doesn't appear to be much difference in the variation in school district land area in square miles between districts that have 100 students per building and districts that have up to 400 students per building. One school district with less than 100 students per building has 10 square miles in land area while another school district with the same average enrollment per building has 688 square miles.

In Table 18, it can be noted that the percentage of students transported greater than 2.5 miles varies within attendance center size. The maximum percentage of students bused is fairly equal across all levels, ranging from 74

Table 17
Land Area In Square Miles
Per School District Average
By Attendance Center Size

	Average Enrollment Per Center	Land Area in Square Miles	Minimum Number of Sq. Miles	Maximum Number of Sq. Miles
1	< 100	288	10	688
2	101 - 200	324	13.5	992
3	201 - 300	258	22	914
4	301 - 400	246	14	928
5	401 - 500	152	8	463
6	≥ 501	101	36	300

Table 18
Percentage of Enrollment Transported
Greater than 2.5 Miles
1993-94
By Attendance Center Size

	Average Enrollment Per Center	Percent Enrollment Bused > 2.5 Miles	Minimum Percent	Maximum Percent
1	< 100	50.7%	15.9%	84.1%
2	101 - 200	41.4%	4.9%	87.8%
3	201 - 300	33.2%	5.6%	84.3%
4	301 - 400	21.3%	0.0%	86.9%
5	401 - 500	27.5%	8.7%	74.4%
6	≥ 501	27.4%	10.6%	86.6%

percent for buildings with 400 to 500 students to 87.8 percent for buildings with 101 to 200 students per building.

Arrayed in Table 19 is Assessed Valuation per Pupil by attendance center size and, in Table 20, Total Expenditures and Transfers per pupil.

Table 19
Assessed Valuation Per Pupil
Five Year Average (1989-90 to 1993-94)
By Attendance Center Size

	Average Enrollment Per Center	Assessed Valuation Per Pupil	Minimum	Maximum
1	< 100	$61,683	$20,896	$449,125
2	101 - 200	43,965	8,268	258,749
3	201 - 300	26,678	13,515	201,185
4	301 - 400	35,086	11,826	567,165
5	401 - 500	27,608	13,089	36,957
6	≥ 501	38,280	13,572	57,860

Table 20
Total Expenditures & Transfers Per Pupil
1993-94
By Attendance Center Size

	Average Enrollment Per Center	Total Expenditures & Transfers Per Pupil	Minimum	Maximum
1	< 100	$7,107	$5,636	$10,471
2	101 - 200	5,697	4,248	7,186
3	201 - 300	4,923	3,832	6,148
4	301 - 400	4,276	3,724	5,799
5	401 - 500	4,333	3,735	5,594
6	≥501	4,420	3,835	4,997

Correlation

To assess the relationship between O&M and the selected variables presented in Tables 15 - 20, correlation analysis was incorporated. A matrix for Pearson product-moment correlation coefficients (Pearson *r*) and for Spearman Rho (rank order correlation) for selected variables is presented in Appendix A.

A basic assumption that underlies the use of the Pearson *r* is that two variables have a linear relationship. Pearson *r* is inappropriate to describe a curvilinear relationship. The data for several of the variables appears to be nonlinear. It is for this reason that both the Pearson *r* and the Spearman rank order correlation were incorporated. When there is a large difference between the outcomes of the two procedures, it is indicative of the presence of outliers,

nonlinearity, non-normality, etc. When there is a nonlinear trend in the data, the use of the Pearson *r* will underestimate the relationship between two variables[5]. The following is a Rule of Thumb for Interpreting the Size of a Correlation Coefficient by Hinkle[6] and associates.

Interpreting the Size of a Correlation Coefficient

Correlation Coefficient Size	Interpretation
.90 to 1.0 (-.90 to -1.00)	Very high positive (negative)
.70 to .90 (-.70 to -.90)	High positive (negative)
.50 to .70 (-.50 to -.70)	Moderate positive (negative)
.30 to .50 (-.30 to -.50)	Low Positive (negative)
≥.00 to .30 (.00 to -.30)	Little if any correlation

[5] See Roe Johns, "Costs of Education Due to Sparsity of Population", Journal of Education Finance, Fall 1975, p. 191. Spearman rank order correlation was incorporated in the assessment of Florida's cost of education due to sparsity.

[6] See Dennis Hinkle, William Wiersma, Stephen Jurs, Applied Statistics for the Behavioral Sciences, Houghton Miffin Company, 1979, p. 85.

Correlation with Total Expenditure & Transfers Per Pupil

Table 21
Correlation Coefficients
Five Year Average: **Total Expenditures & Transfers Per Pupil**

and Five Year Average for:	Pearson	Spearman
Total O&M Per Pupil	.77	.77
Non-Salary Related O&M/Pupil	.67	.74
Students Per Attendance Center	-.73	-.85
Enrollment (FTEE)	-.31	-.93
Area Square Miles	.16	.30
Density (Area/ 5 Yr Avg Enrollment)	-.29	-.81
Percent of Students Bused >2.5 mi.	.22	.25
Total Assessed Valuation/Pupil	.44	.65
Heating Cost / Pupil	.75	.73
Electricity Cost / Pupil	.42	.44

Pearson *r* Correlation and Spearman (Rank Order Correlation)
Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

The relationship between Total Expenditures and Transfers per pupil and school district size has continued to increase since 1989-90. The rank order correlation coefficients for 1989-90 to 1993-94 are: 1989-90 (-.865), 1990-91 (-.866), 1991-92 (-.882), 1992-93 (-.926), 1993-94 (-.965). The very strong negative relationship indicates that as school district size decreases, Total Expenditures and Transfers per pupil will increase or, as school district size increases, per pupil expenditures will decrease. The very strong relationship indicates that most data related to past expenditure history will show a school district size relationship.

Correlation with Assessed Valuation Per Pupil

Table 22
Correlation Coefficients
Five Year Average: **Assessed Valuation Per Pupil**

and Five Year Average for:	Pearson	Spearman
Total O&M Per Pupil	.39	.48
Non-Salary Related O&M/Pupil	.27	.38
Students Per Attendance Center	.19	-.53
Enrollment (FTEE)	-.07	-.54
Area Square Miles	.18	.56
Density (Area/ 5 Yr Avg Enrollment)	-.08	-.73
Percent of Students Bused >2.5 mi.	-.07	-.06
Total Assessed Valuation/Pupil	.44	.65
Heating Cost / Pupil	.26	.61
Electricity Cost / Pupil	.61	.40

Pearson *r* Correlation and Spearman (Rank Order Correlation)
Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

Note the differences in the Pearson and the Spearman correlation coefficients for some of the variables. This is an indication that some of the variables are non-linear. This problem will be addressed in a later section.

The rank order correlation coefficients indicate that Assessed Valuation per Pupil has a high negative relationship with student density, a moderate positive relationship with Total Expenditures and Transfers per Pupil and Heating Cost per Pupil, a moderate negative relationship with school district size and attendance center size and a low positive relationship with electricity cost per pupil.

Non-Salary Related O&M expenditures per pupil had little or no relationship to land area in square miles (.16), to percent of students bused greater than 2.5 miles (.27), or to assessed valuation per student (.37), but a high positive relationship to total expenditures and transfers per pupil (.73).

Because of the high positive relationship to total expenditures and transfers, total Non-Salary Related M&O could not be used as the measure of expenditure activity.

Unbiased Category

After an extensive examination of the 21 O&M categories and their relationship to participating rates, past expenditure history (measured by a strong correlation to Total Expenditures and Transfers), to local wealth (measured by a moderate to strong correlation to Assessed Valuation per pupil), and to school district size, one category was found that had a low relationship to those areas and could be considered as unbiased.

Using the Spearman rank order correlation as the measure of relationship, the five year average Heating costs per pupil had a high negative relationship to attendance center size (.-73), to enrollment or school district size (-.71), to density (-.77), a high positive relationship to Expenditure and Transfers (.73), and a moderate positive relationship to Assessed Valuation per pupil (.61). In summary, Heating costs per pupil represent past expenditure history, school district size, and local wealth.

For electricity costs per pupil, there is a low to no relationship to all of the same variables and as with heating costs, 99 percent of the school districts have participated in the category over the five year period. Electricity costs per pupil do not represent past expenditure history, school district size, or local wealth as verified by the correlation coefficients arrayed in Table 23, accompanied by the coefficients for Heating costs per pupil.

Table 23
Correlation Coefficients
Five Year Average (1989-90 to 1993-94)
Electricity Costs Per Pupil
Heating Costs Per Pupil

Categories	Electricity		Heating	
Five-Year Average	Pearson	Spearman*	Pearson	Spearman*
Total O&M Per Pupil	.51	.52	.66	58
Non-Salary Related O&M/Pupil	.42	.47	.54	.54
Students Per Attendance Center	-.19	-.24	-.61	≥-.73
Enrollment (FTEE)	-.11	-.33	-.23	-.71
Area Square Miles	.12	.14	.26	.45
Density	-.14	-.34	-.19	-.77
% Students Transported >2.5 mi	.05	.09	.13	.15
Assessed Valuation Per Pupil	.61	.40	.25	.61
Heating Cost / Pupil	.23	.23		
Expenditure & Transfers/Pupil	.42	.44	.75	.73

Pearson r Correlation, * Spearman Rank Order Correlation
Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

Electricity costs per pupil have a low relationship to area in square miles (.45), percentage of students transported (.09), attendance center size (-.24), school district size (-.33), density (-.34), assessed valuation per pupil (.40), and total expenditure per pupil (.44). Electricity costs per pupil, more so than any of the 17 non-salary related O&M categories, represents the most unbiased measurement of O&M costs. A closer examination of heating and electricity costs per pupil is presented in the next section.

Heating and Electricity Costs

Per student, a small school district may have greater electricity and heating costs relative to other school districts, but as a percentage of Total Non-Salary Related O&M costs this may not be the case. Over the five year period, the average electricity and heating costs per pupil represents 47.38

percent of Total Non-Salary Related O&M costs per pupil with variations from nine to 74 percent. The median was 47.48 percent. On an average, heating costs per pupil consume 14.86 percent of Non-Salary Related O&M costs and Electricity costs consume 32.5 percent.

Presented in the following tables are the Heating and Electricity costs per pupil and as a percentage of Non-Salary Related O&M Expenditures. Data are arrayed by both attendance center size and by school district size.

As will be noted by the data, some school districts spend a greater percentage of their O&M budget for Heating and Electricity costs than other school districts. Also of interest is the variation in heating and electricity costs among school districts with a similar number of students per attendance center and a similar number of students per school district. For example, in school districts that have an average of 301 to 400 students per attendance center, the per pupil cost for electricity ranges from $28 to $336 and in districts with less than 100 students per buildingthe range is from $44 to $231 per pupil.

Table 24
Heating Costs Per Pupil
5 Year Average
1989-90 to 1993-94
By Attendance Center Size

	Average Enrollment Per Center	Heating Costs Per Pupil	Minimum	Maximum
1	< 100	$94	$27	$223
2	101 - 200	59	10	133
3	201 - 300	42	15	114
4	301 - 400	36	14	78
5	401 - 500	31	6	50
6	≥ 501	27	12	39
	Average	$38		
	Median	$35		

Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

Arrayed in Table 25, are heating costs per pupil by school district size as opposed to attendance center size presented in Table 24. In school districts with less than 100 students, heating costs per pupil range from $64 to $223. For the 33 school districts with 101 to 200 enrollment, heating costs range from $27 to $204 per pupil. Some of the school districts with enrollments of 101 to 300, 401 to 600, 4,000 to 9,000, and greater than 20,000 have about the same per pupil heating costs of $26 to $29 per pupil, as observed from the minimum per pupil amount column in Table 25.

Table 25
Heating Cost Per Pupil
Five Year Average (1989-90 to 1993-94)
By School District Size

	School District Size	# School Dists	Student Count	Mean	Standard Deviation	Minimum	Maximum
1	<= 100	5	468	**$151**	$53	$64	$223
2	101 - 200	33	5,382	**102**	46	27	204
3	201 - 300	28	7,313	**81**	36	27	181
4	301 - 400	33	11,506	**68**	21	15	133
5	401 - 500	35	15,531	**61**	20	26	104
6	501 - 600	20	10,746	**67**	19	29	114
7	601 - 700	23	14,228	**48**	16	10	80
8	701 - 800	15	10,812	**43**	14	14	67
9	801 - 900	14	11,150	**40**	14	15	60
10	901 - 1,000	8	7,463	**43**	11	19	53
11	1,001 - 2,000	46	62,800	**39**	12	18	85
12	2,001 - 3,000	14	31,807	**32**	9	17	45
13	3,001 - 4,000	10	33,491	**29**	10	6	42
14	4,000 - 6,000	5	22,379	**41**	18	29	75
15	6,000 - 9,000	6	41,120	**28**	5	24	38
16	9,000 -20,000	3	38,565	**25**	10	12	36
17	>= 20,001	3	95,701	**33**	3	29	36
5 Year Average				**$38**			
Median				**$35**			

Heating cost per pupil have a high negative correlation with attendance center size and with school district size (-.73 and -.71 respectively) and a high positive relationship with Total Expenditures & Transfers per Pupil and Assessed Valuation per Pupil (.73 and .61 respectively). The data indicate that Heating cost per pupil are highly related to past legislative history, as measured by Total Expenditures and Transfers, and to local wealth. Therefore, heating cost per pupil would not be a good comparative measure of school district size expenditure activity.

Electricity Cost Per Pupil

The Pearson correlation coefficient indicates a moderate relationship (.61) for electricity cost per pupil and local wealth, but the rank order correlation coefficient indicated a low correlation of .40. As noted in the discussion on correlation, when there is a large difference between the outcomes of the two procedures, it is indicative of the presence of outliers, nonlinearity, non-normality, etc.

On a closer examination of the data by a scatter plot, it appeared that a nonlinear relationship existed between assessed valuation per pupil and electricity costs per pupil. The scatter plot had clusters of school districts with greater than $100,000 assessed valuation per pupil and high electricity costs and clusters less than $100,000. By re-running the data with a division in the data of greater and less than $101,000 assessed valuation per pupil, it was found that school districts with greater than $101,000 assessed valuation per pupil had a high correlation with electricity cost per pupil for both the Pearson and rank order (.80 and .85 respectively). School districts with less than $101,000 assessed valuation per pupil had a very low correlation of .33 (Pearson) and .32 (rank order).

On an average, electricity costs per pupil and local wealth have a small relationship, but for school districts with over $101,000 assessed valuation per pupil there is a high positive relationship. This indicates that for some specific high wealth school districts, high electricity costs are associated with high assessed valuation per pupil and the high electricity costs for these districts cannot be attributed to a school district size problem. When the electricity

costs per pupil of these high wealth districts are averaged in with other school districts of similar size, the average school district cost per pupil will elevate. The problem this creates reverts back to the question of trying to determine the relationship between school district size and level of expenditures. It is a complex determination.

Arrayed in Table 26 and Table 27 are electricity costs per pupil by attendance center size and by school district size. When electricity costs per pupil are arrayed by greater than and less than the average of $84 per pupil, the school districts have similar high costs and similar low costs across all sizes.

Table 26
Electricity Costs Per Pupil
5 Year Average
1989-90 to 1993-94
By Attendance Center Size

	Average Enrollment Per Center	Electricity Costs Per Pupil	Minimum	Maximum
1	< 100	$99	$44	$231
2	101 - 200	93	40	217
3	201 - 300	83	40	188
4	301 - 400	72	37	336
5	401 - 500	78	41	123
6	≥ 501	99	56	130
	Average	$84		
	Median	$84		

Table 27
Electricity Costs Per Pupil
Five Year Average (1989-90 to 1993-94)
By School District Size

School District Size		Student Count	Mean	Standard Deviation	Minimum	Maximum
1	<= 100	468	$117	$22	$88	$156
2	101 - 200	5,382	122	42	44	231
3	201 - 300	7,313	89	30	42	159
4	301 - 400	11,506	104	44	47	203
5	401 - 500	15,531	93	38	45	218
6	501 - 600	10,746	93	34	41	171
7	601 - 700	14,824	92	33	54	200
8	701 - 800	10,812	114	50	40	244
9	801 - 900	11,150	97	26	63	168
10	901 - 1,000	7,463	121	84	62	336
11	1,001 - 2,000	63,801	76	30	37	173
12	2,001 - 3,000	31,807	79	26	41	120
13	3,001 - 4,000	33,491	75	16	41	94
14	4,001 - 6,000	22,379	66	26	27	107
15	6,001 - 9,000	41,120	57	15	39	89
16	9,001 - 20,000	38,565	90	30	45	109
17	>= 20,001	95,701	91	11	71	99
5 Yr Average			$ 84			
Median			$ 84			

The school district with the highest five year average electricity costs per pupil ($336) has a five year average assessed valuation per pupil of $567,338. The question that cannot be answered by the data is why some school districts have extraordinarily high electricity costs per pupil when school districts of the same size have such different costs? One answer is that some school districts have air conditioning and others do not. But, when the data were divided by school districts with greater than and less than $84 per pupil for electricity costs, the school districts acted in a similar manner above and below the average point.

Partial Summary

When incorporating an unbiased measurement for comparing school district size and expenditures, the data indicate that school district size is not a factor in non-salary related costs per pupil. When the school districts are compared on data that represents past expenditure history, the school districts appear to have a relationship between expenditures and school district size. But, breaking the expenditures down to their component parts reveals that school districts with high expenditures are spending greater amounts of money per pupil in a greater number of the 21 Operations and Maintenance categories than school districts with low expenditures (see Appendix I for a comparison of all school districts on the 21 O&M categories).

The data indicate that expenditures for attendance centers are dependent upon the school district size the center is located in. It was found that attendance centers of equal size located in different school districts have unequal expenditures. Many of the school districts have spent zero amounts over a five year period on operations and maintenance categories while other school districts have maintained a high level of spending year after year. One immediate recommendation for the inequity in funding for Operations and Maintenance Costs would be to make an adjustment for electricity costs relative to Total Non-Salary O&M costs. The rationale for this adjustment is addressed in the following section.

Heating and Electricity Costs as a Percentage of Non-Salary Related Operations & Maintenance Costs

The most important measure of heating and electricity costs per pupil is the relative measure to Non-Salary O&M costs. A school district may appear to have a small or large heating or electricity expense per pupil, but relative to their non-salary operations and maintenance budget, the picture may change, depending on the size of the budget. Arrayed in Tables 28 and 29 are heating costs per pupil as a percentage of Non-Salary Related O&M costs.

Table 28
Heating Costs Per Pupil
As a Percentage of Non-Salary Related O&M Costs
5 Year Average (1989-90 to 1993-94)
By Attendance Center Size
Kansas School Districts

	Average Enrollment Per Center	Heating Percent of Non-Salary O&M	Minimum Percent	Maximum Percent
1	< 100	20.0%	6.3%	43.5%
2	101 - 200	15.9%	2.6%	40.0%
3	201 - 300	14.3%	4.2%	24.4%
4	301 - 400	16.4%	3.6%	26.6%
5	401 - 500	14.8%	2.6%	25.8%
6	≥ 501	12.4%	3.2%	18.5%
	Average	14.9%		
	Median	14.5%		

On an average, the percentage of heating costs per pupil to Non-Salary O&M costs decreases with attendance center size and with school district size to 801 - 900 enrollment and then appears to increase. It is apparent that school districts of the same size have varying degrees of their operations and maintenance budget consumed by heating costs.

Table 29
Heating Costs Per Pupil
As a Percentage of Non-Salary Related O&M Costs
Five Year Average (1989-90 to 1993-94)
By School District Size

School District Size	Student Count	% Mean	Standard Deviation	Minimum	Maximum
1 <= 100	468	24%	9%	9%	36%
2 101 - 200	5,382	20	7	6	33
3 201 - 300	7,313	18	8	3	44
4 301 - 400	11,506	16	5	3	27
5 401 - 500	15,531	15	6	5	28
6 501 - 600	10,746	17	6	5	26
7 601 - 700	14,824	13	4	3	21
8 701 - 800	10,812	11	5	4	20
9 801 - 900	11,150	10	5	5	23
10 901 - 1,000	7,463	12	5	4	20
11 1,001 - 2,000	63,801	16	6	6	40
12 2,001 - 3,000	31,807	15	5	8	26
13 3,001 - 4,000	33,491	13	6	3	27
14 4,001 - 6,000	22,379	16	5	12	26
15 6,001 - 9,000	41,120	14	4	10	22
16 9,001 - 20,000	38,565	12	7	3	21
17 >= 20,001	95,701	16	2	14	19
5 Yr Average		14.9%			
Median		14.5%			

Electricity Costs as a Percentage of Non-Salary O&M Costs

On an average, the smaller the attendance center or the school district the smaller the percentage of operations and maintenance budget is consumed by electricity costs because (1) electricity costs per pupil are more constant across the school districts than any of the 21 O&M categories; and (2) the expenditure base decreases as size increases.

Table 30
Electricity Costs Per Pupil
As a Percentage of Non-Salary Related O&M Costs
5 Year Average (1989-90 to 1993-94)
By Attendance Center Size
Kansas School Districts

	Average Enrollment Per Center	Electricity Percent of Non-Salary O&M	Minimum Percent	Maximum Percent
1	< 100	21.6%	8.5%	45.3%
2	101 - 200	24.0%	5.6%	46.4%
3	201 - 300	27.6%	7.9%	43.1%
4	301 - 400	29.6%	14.7%	58.7%
5	401 - 500	37.1%	17.3%	52.4%
6	≥ 501	41.8%	21.9%	51.8%
	Average	32.5%		
	Median	32.6%		

As much as 58 percent of Non-Salary O&M budget is consumed by electricity costs for one school district compared to six percent for another. School districts of the same size have varying rates of consumption as did attendance centers of the same size.

Table 31
Electricity Costs Per Pupil
As a Percentage of Non-Salary Related O&M Costs
Five Year Average (1989-90 to 1993-94)
By School District Size

School District Size		Student Count	% Mean	Standard Deviation	Minimum	Maximum
1	<= 100	468	19%	6%	13%	26%
2	101 - 200	5,382	25	8	8	45
3	201 - 300	7,313	20	7	6	40
4	301 - 400	11,506	25	10	11	46
5	401 - 500	15,531	22	8	8	43
6	501 - 600	10,746	22	7	10	35
7	601 - 700	14,824	24	8	15	43
8	701 - 800	10,812	29	12	9	51
9	801 - 900	11,150	27	10	10	43
10	901 - 1,000	7,463	30	12	18	59
11	1,001 - 2,000	63,801	29	9	14	48
12	2,001 - 3,000	31,807	35	9	21	52
13	3,001 - 4,000	33,491	33	7	23	45
14	4,001 - 6,000	22,379	25	12	10	46
15	6,001 - 9,000	41,120	28	5	23	38
16	9,001 - 20,000	38,565	33	6	26	41
17	>= 20,001	95,701	45	5	37	52
5 Year Average			32.5%			
Median			30.6%			

The average per pupil cost for electricity of $84 remains pretty constant across the school districts. Non-Salary Related O&M costs per pupil varies across school districts with an increase as school district size decreases. If large school districts have a decrease in O&M budget and a constant in electricity costs then the percentage of electricity costs for the large districts will be greater than for the smaller districts.

Adjustment
Non-Salary Related Operation and Maintenance Costs
As Related to Electricity Costs

The smallest attendance center size has an average Electricity cost per pupil of $99 compared to $96 per pupil for the largest attendance center size. The smallest school district size (less than 100 enrollment) has an average Electricity cost per pupil of $117, compared to $91 for the largest school district size (enrollment greater than 20,000).

From previous tables, we have noted that as attendance centers become larger, O&M expenditures per pupil, Total Expenditures and Transfers per pupil, and Assessed Valuation per pupil become smaller. We have also noted that Electricity cost per pupil, unlike Heating cost per pupil, is not associated with size, local wealth, or past expenditure history. Electricity costs consume a larger portion of Non-Salary Related O&M expenditures as school district size increases because the base decreases and the electricity cost per pupil remain fairly constant across large and small districts.

Because Non-Salary related O&M expenditures per pupil vary across the school districts and electricity costs per pupil remain constant, an adjustment to O&M is recommended based on the median percentage of electricity cost per pupil to Non-Salary Related O&M cost per pupil.

Adjustment Ratio

I. Average Percentage or Median Percentage -
Based on Five Year Average Electricity Costs per pupil

State Average of all School Districts:

$$\frac{\text{Five Year Average Electricity Costs Per Pupil}}{\text{Five Year Average Non-Salary Related Operations and Maintenance Costs Per Pupil}}$$

The five year average (1989-90 to 1993-94) Percentage of Electricity costs per pupil to Non-salary Related Operations and Maintenance costs per pupil equals **32.51242**; the median equals **32.61314** percent.

II. Adjustment for School Districts that have a percentage of Electricity cost per pupil to Non-Salary Related Operations and Maintenance costs per pupil greater than the state average or greater than the state median.

a. Based on the Average of 32.51242 percent

$$\frac{\text{School District Five Year Average Electricity Cost per pupil}}{.3251242}$$

b. Based on the Median of 32.61314 percent

$$\frac{\text{School District Five Year Average Electricity Cost per pupil}}{.3261314}$$

III. Calculate the difference of the projected Non-Salary Operations and Maintenance costs per pupil and the Actual costs per pupil for the current year. Multiply the difference times the FTEE Enrollment for the current year.

IV. Exceptions

School Districts with an assessed valuation two standard deviations above the mean would not qualify for this adjustment. In the current analysis, school districts with greater than $101,000 assessed valuation per pupil have above ordinary average electricity costs per pupil and above ordinary average ratio of electricity costs per pupil to non-salary related operations and maintenance costs per pupil.

If these school districts are included in the adjustment for operation and maintenance costs per pupil, then another adjustment should be incorporated for extra ordinary electric costs per student combined with assessed valuation per student.

V. Located in Appendix F is a list of school districts that would be affected by the adjustment, the amount of the adjustment, and the total cost to the state to make this adjustment. The total cost would be approximately $13,000,000. This amount excludes the school districts with greater than $101,000 assessed valuation per pupil.

The adjustments for Non-Salary Related Operations and Maintenance Costs per pupil are based on the median of 32.61314 percent, the ratio of Electricity Costs per pupil to Non-Salary Related Operations and Maintenance Costs per pupil based on a five year average (1989-90 to 1993-94).

Adjustment Method
Fairness

The use of a median percentage of electricity costs per pupil to Non-Salary Related Operations and Maintenance costs per pupil is fair and equitable for the following reasons:

1. On an average, electricity costs per pupil are not a function of past legislative history, are not related to local wealth, school district size, land area of a school district, density, or total expenditure and transfers per pupil.

2. Applying a percentage as the adjustment to actual electricity costs brings school districts on an equitable level of funding for operations and maintenance. The median percentage sets a standard that is relative to all school districts in the state.

3. The percentage application does not look at type of district nor size of district, but what level of funding the school district has over a five year period in relation to electricity cost to non-salary related operations and maintenance costs.

Certified Personnel

The purpose of examining certified personnel was to define an equivalent educational program offered by a majority of the school districts in the state of Kansas.

Five years of data were collected on certified personnel, but upon an examination of the data it appeared there was a difference in the certified personnel activity before and after 1991-92. Therefore, data were examined for the years 1991-92, 1992-93, and 1993-94.

Presented in Tables 31, 32, and 33 are data related to the number of certified personnel over a five year period, and the number and percentage of school districts listing the personnel category over a three year period.

Table 32
Number of Students, Certified and
Non-Certified Personnel
1989-90 to 1992-93

	Certified Personnel	Non-Certified Personnel	Enrollment
1989-90	33,694	16,465	407,882
1990-91	34,324	16,953	414,593
1991-92	34,568	17,059	424,734
1992-93	36, 82	18,102	431,320
1993-94	36,763	19,019	437,208
89-90 to 93-94	9 % Increase	15.5% Increase	7.2% Increase

Data Source: Kansas State Board of Education

Table 33
Certified Personnel
1991-92, 1992-93, 1993-94
Number of School Districts
Listing Personnel Category
By Year

CERTIFIED PERSONNEL CATEGORY		NUMBER OF # SCHOOL DISTRICTS THAT LISTED CATEGORY			3 YR AVG LISTED CATEGORY
		1991-92	1992-93	1993-94	3 YR AVG
SUPERINTENDENT	*	301	304	304	303
ASSISTANT SUPT		70	68	72	70
ADMIN ASSISTANT		27	33	38	33
PRINCIPAL	*	300	301	301	301
ASSISTANT PRIN		108	110	115	111
DIR SPECIAL ED		57	58	56	57
DIR HEALTH		304	11	11	109
DIR VOCATIONAL		14	16	15	15
DIR CUR INSTR		31	27	41	33
DIR OTHER		72	70	76	73
CURR SPEC		31	28	33	31
VOC TEACHER		135	141	141	139
SPEC ED TEACHER		91	93	90	91
PR-K TEACHER		38	42	46	42
K-TEACHER	*	303	303	304	303
OTHER TEACHER	*	304	304	304	304
LIBRARY MEDIA	*	301	300	300	300
SCHOOL COUNSELOR		297	300	299	299
CLINICAL PSYCH		63	62	60	62
NURSE		143	129	131	134
PATHOLOGIST			54	53	36
AUDIOLOGIST			13	12	8
SOCIAL WORKER		31	36	33	33
READING SPC	*	149	165	168	161
OTHER		70	85	84	80

Data Source: Kansas State Board of Education, 1991-92 to 1993-94 Data.

Table 34
Certified Personnel
Three Year Average (1991-92 to 1993-94)
Percentage of School Districts
Listing Personnel Category

CERTIFIED PERSONNEL CATEGORY		3 YEAR AVERAGE PERCENTAGE OF SCHOOL DISTRICTS LISTING CATEGORY
SUPERINTENDENT	*	**99.7%**
ASSISTANT SUPT		23.0
ADMIN ASSISTANT		10.7
PRINCIPAL	*	**98.9**
ASSISTANT PRIN		36.5
DIR SPECIAL ED		18.8
DIR HEALTH		35.7
DIR VOCATIONAL		4.9
DIR CUR INSTR		10.9
DIR OTHER		23.9
CUR SPEC		10.1
VOC TEACHER		45.7
SPEC ED TEACHER		30.0
PR-K TEACHER		13.8
K-TEACHER	*	**99.8**
OTHER TEACHER	*	**100.0**
LIBRARY MEDIA	*	**98.8**
SCHOOL COUNSELOR	*	**98.2**
CLINICAL PSYCH		20.3
NURSE		44.2
PATHOLOGIST		11.7
AUDIOLOGIST		2.7
SOCIAL WORKER		11.0
READING SPC	*	**52.9**
OTHER		26.2

Data Source: Kansas State Board of Education, 1991-92 to 1993-94 Data.

Seven categories of certified personnel were listed by 50 percent or more of the school districts over the three year period (1991-92 to 1993-94) examined. The seven categories reported by 50 percent of the school districts were:

1. Superintendent
2. Principal
3. Kindergarten Teacher
4. Other Teachers
5. Library Media
6. School Counselor
7. Reading Specialist

Seven categories of certified personnel were listed by 50 percent or more of the school districts over the three year period (1991-92 to 1993-94) examined. The seven categories reported by 50 percent of the school districts were:

1. Superintendent
2. Principal
3. Kindergarten Teacher
4. Other Teachers
5. Library Media
6. School Counselor
7. Reading Specialist

The seven categories could be divided into Instructional Personnel and Administration. From this information, the minimum number of instructional certified personnel can be proposed for one school unit of Kindergarten through twelfth grade. This would be the minimum number of certified personnel needed by a school district to enable the school district to offer an equivalent educational program that is offered by a majority of the school districts in the state of Kansas.

I. Minimum Number of Instructional Certified Personnel K-12
One Unit Educational Program

Kindergarten Teacher	1
Classroom Teacher Per Grade	12
School Counselor	1
Library Media	1
Reading Specialist	1
Minimum Number Instructional Staff	16

School District Size

From the minimum number of instructional certified personnel required to offer an equivalent educational program offered by a majority of the school districts in the state, the minimum school district size can be determined if the minimum ratio of students to instructional personnel is also stipulated. The

minimum ratio of students to instructional personnel would not apply to all school districts in the state. It would apply to the K-12 school unit to generate the minimum school size that would support an equivalent educational program.

School districts with over the minimum number of students recognized by the state as a small school would not need additional funding to support an equivalent educational program as their student numbers would support the staff required.

The major limitation of this type of recommendation would be the impact the results would have on the total way of funding schools in the state of Kansas. A specified number of certified and non-certified personnel per 1,000 students would need to be recommended and established. A specified number of students per administrator would have to be established. The number of counselors, library media, and reading specialists would have to be established for a specified number of students and a state salary schedule would have to be established. The funding mechanism would have to be changed to a student unit. Personnel would be funded by the number of students regardless of school size, except for the recognized school size that could not support the required staff for an equivalent education program offered by a majority of the school districts in the state.

The following is a formula for determining the minimum number of students needed to support one unit of an equivalent educational program provided by a majority of the school districts in the state.

Formula for Determining the Minimum Number of Students Needed to Support a Minimum Educational Program

I. Ratio of students to K-12 Certified Instructional Personnel for the five categories (Kindergarten, Classroom Teacher, School Counselor, Library Media, Reading Specialist)

Determine Accepted Ratio

$$\frac{\text{K-12 FTEE Enrollment}}{\text{Number of Certified Instructional Personnel K-12 (6 Categories)}}$$

II.

$$\frac{\text{Ratio: Students to Instructional Staff}}{1} = \frac{X}{16}$$

III. The solution to equation II will tell the state the minimum number of students at the specified student to instructional staff ratio that will support the number of certified personnel needed to provide an educational program that is equivalent to programs provided by a majority of the school districts in the state. School districts with a greater number of students than stipulated in equation II would have a sufficient number of students to support the staff required for an equivalent educational program.

The arbitrary number in this solution to determining what size school district should receive additional funding to support an equivalent educational program is the accepted ratio of students to instructional staff by the state. Different ratios will determine different numbers of students required to support the minimum educational program. Based on different ratios, the

following number of students would be required by a school district to support the basic educational program.

Ratio: 6 students to 1 Certified Staff

$$\frac{6}{1} = \frac{X}{16}$$

Minimum School District Size
X = 96

Ratio: 10.9 students to 1 Certified Staff

$$\frac{10.9}{1} = \frac{X}{16}$$

Minimum School District Size
X = 174.4

Ratio: 13.335 students to 1 Certified Staff

$$\frac{13.335}{1} = \frac{X}{16}$$

Minimum School District Size
X = 213.36

Ratio: 19.7 students to 1 Certified Staff

$$\frac{19.7}{1} = \frac{X}{16}$$

Minimum School District Size
X = 315.2

With the present funding system, only four of the 304 school districts have less than 16 certified instructional staff. In total, only 10 school districts have 16 or less certified staff, based on a three year average of the five instructional categories. Average enrollment for these 10 school districts was less than 188 students per school district.

Several states have incorporated a guaranteed number of Instructional Units in their funding formula for small or isolated schools/school districts. Alaska's Foundation Program is based on the "instructional unit" method of

funding with a sliding scale for funding communities that have an average daily membership of less than 200 in grades K-6 or less than 200 in grades 7-12. Idaho, Hawaii, Montana, North Carolina, Washington, and Wyoming have provisions for additional instructional units[7]

See Appendix D for a summary of Alaska's funding mechanism for small schools and Appendix E for Table summaries of non-certified personnel.

Summary of the Quantitative Data Analysis

The purpose of the data analysis was to (1) ascertain the magnitude of the relationship between school district enrollment size and expenditure levels; (2) determine the extent to which economy of scale accounts for such relationship; and (3) document a rational basis for providing additional revenue to low enrollment school districts.

The research questions to be explored were:

1. Is there a relationship between school district enrollment size and expenditure levels?
2. Are differences in school district expenditures due to enrollment size or to other factors?
3. At what school district enrollment size does economy of scale account for a difference in expenditures?

To answer the three research questions, five years of school data for the years 1989-90 to 1993-94 were examined. Specific information such as Expenditures and Transfers per Pupil and salary related expenditures could not be used in the analysis because they represented past legislative history. It

[7] William E. Sparkman & Clint Carpenter, "State Funding Mechanisms for Rural, Small, and Isolated Schools, 1994.

was felt that the results from an examination of past legislative history data would be a direct reflection of the existing system.

The statement of the problem guided the direction for areas of investigation.

> Low enrollment weighting recognizes and compensates for the higher fixed and operating costs per pupil necessary to provide an education program in low enrollment districts of less than 1,900 enrollment in the State of Kansas.

Such costs include:

(1) Basic educational programs and services,
(2) Repair and maintenance of facilities,
(3) Administration,
(4) Support and instructional staff, and
(5) Equipment and other overhead.

From an examination of state school expenditures by expenditure categories, 74 percent of total expenditures (transfers excluded) could be attributed to Instructional and School Administration categories. The major remaining expenditure category was Operations and Maintenance, which had strong elements of the costs included in the statement of the problem and accounted for 59 percent of the remaining expenditures.

Findings of the Data

1. The data analysis was based on five years of Kansas school data. Throughout this study, school districts were not identified by name. In essence, this part of the study was a blind review of the school districts.

2. Data related to past expenditure history could not be used in the data analysis. Therefore, Expenditure and Transfers per pupil and Salary related data were omitted in analyzing the problem.

3. The greatest statistical problem encountered was the non-normality of many of the variables or data that contained serious outliers or were non-linear. In the measure of relationships, a basic assumption that underlies the use of the Pearson correlation analysis is that two variables have a linear relationship. Pearson is inappropriate to

describe a curvilinear relationship. For this data study, rank order correlation analysis was incorporated along with the Pearson.

4. The greatest challenge was in identifying an expenditure area that was not reflective of past expenditure history.

5. From 1989-90 to 1993-94, the relationship between Expenditures and school district size has increased, as noted in the increase of the rank order correlation coefficients from -.86 to -.96. This indicates that in 1989-90 approximately 74 percent of the variation in expenditures could be attributed to school district size and by 1993-94, 92 percent of the variation in expenditure data could be attributed to school district size.

6. From the analysis of the data, it was found that school district size was not significantly related to land area in square miles, percentage of students bused greater than 2.5 miles, or assessed valuation of property per pupil. It was found that school districts with less than 100 students per attendance center could have as little as 10 square miles of land area or 688 square miles; that from 16 to 84 percent of the students could be bused greater than 2.5 miles; and that assessed valuation per student could be as small as $21,000 and as large as $449,000. In summary, there was no pattern in what constitutes a small school district other than the state designation of less than 1,900 enrollment.

7. Operations and maintenance was chosen as the base element of this study for the following reasons:
   a. A reference point had to be chosen that was relative to all the school districts in the state.
   b. The reference point could not reflect past legislative history of the funding formula.
   c. The reference point needed to be one that was free of the influence of local choice and local wealth, would remain constant over time, and was a necessary function of the basic school operation.

   Operations and Maintenance represents 58 percent of the expenditures that remain after Instructional and Administration categories have been removed.

8. Expenditures for Operations and Maintenance consist of 21 categories with four of the categories salary related. Of the 21 categories, Non-certified salaries, Repair of Buildings, Electricity costs, Equipment and Furniture, Rentals, Heating costs, and Repairs and maintenance had the strongest influence on the differences in Operations and Maintenance costs per pupil among the school districts.

9. Over a five year period, 1989-90 to 1993-94, 60 percent of the school districts reported Repair of Buildings as an expenditure. In 1993-94, the average cost per pupil for Repair of Buildings ranged from $2 to $1,103, with 111 school districts reporting zero amounts for this category.

10. In 1993-94, 84 percent of the school districts reported Repairs and Maintenance as an expenditure with costs ranging from sixty cents ($0.60) to $817 per pupil. Thirty-two school districts reported zero amounts for this category. Seventy-five percent (75 percent) of the school districts participated in the category Equipment and Furniture in 1993-94 compared to 57 percent in 1989-90. The per pupil amount expended for Equipment and Furniture in 1993-94 was from $5 to $807, with 77 school districts reporting zero amounts.

11. The five year average for Total Operations and Maintenance per Pupil was $547, with a range between $212 to $1,239 per pupil. Total Operations and Maintenance per pupil could not be used as the main source of the examination because too many school districts had not participated in all the 21 categories over the five year period.

12. It was found that salary related operations and maintenance costs and heating costs were strongly related to past expenditure history.

    Electricity costs per pupil and a composite of the remaining 15 operations and maintenance categories were found not to be related to past expenditure history. But, only electricity cost per pupil was representative of all the school districts. The remaining 15 O&M categories had school district category participation rates from 34 percent to 84 percent.

13. Electricity costs per pupil has a low relationship to total expenditures and transfers per pupil and to local wealth (except for school districts with greater than $101,000 assessed valuation per pupil). From the analysis of five years of data, it was found that Electricity cost per pupil, more so than any of the non-salary related operations and maintenance costs, represents the most unbiased measurement of school district expenditures.

14. For Kansas data, Electricity cost per pupil represents the most unbiased measurement of the relationship between school district expenditures and school district size.

    Electricity cost per pupil represents an example of how expenditures react across school district size when expenditures are not related to the influence of past legislative history.

    The importance of this concept is not the magnitude of the expenditure, but how the legislature acts when it is not related to past legislative history.

15. When incorporating an unbiased measurement, for comparing school district size and expenditures, the data indicate that school district size is not a significant factor in non-salary related costs per pupil in the state of Kansas.

16. When school districts are compared on data that represent past expenditure history, the school districts have a strong relationship with expenditures and school district size.

17. After examining five years of data for the 21 operations and maintenance categories, it was found that differences in the non-salary related categories were due to school districts with high expenditures spending greater amounts of money per pupil in a greater number of the categories than school districts with low expenditures. School district size was not a significant factor in the differences in non-salary related operations and maintenance expenses, except for heating costs per pupil. Heating costs per pupil were found to be reflective of past legislative history and local wealth.

18. The most concrete example of high expenditure school districts spending more money per pupil in a greater number of the non-salary related operations and maintenance categories than low expenditure school districts is to actually look at the differences by category by school districts.

    On 15 non-salary related operations and maintenance expenditure categories, the five year average for the highest expenditure school district is $710 per pupil compared to $25 per pupil for the lowest expenditure school district. The highest expenditure school district spends $338 per pupil on Rentals, the lowest spends zero; the highest spends $125 per pupil on Repair of Buildings, the lowest spends zero; the highest spends $28 per pupil on Equipment and Furniture, the lowest spends zero; and the highest spends $36 per pupil on General Supplies and the lowest spends $7 per pupil. There is a difference in school district size: the highest spending school district has an enrollment of 246 and the lowest, 1,918. The difference in the $710 per pupil expenditures and the $25 per pupil cannot be attributed to the difference in school district size. It can only be attributed to one school district spending a greater amount of money in a greater number of categories than the other school district.

    Another example, one school district with an enrollment of 822 and one with an enrollment of 21,000. The 822 enrollment school district has a per pupil expenditure in the 15 non-salary operations and maintenance categories of $523 and the 21,000 enrollment size has a per pupil expenditure of $85 per student. We ask again, is the difference in expenditure due to school district size or to one school district spending a greater amount of money in a greater number of the categories than another school district. The highest spending school district spends $206 per pupil on Rentals, $73 per pupil on Repair of Buildings, $62 per pupil on General Supplies, and $82 per pupil on Equipment and Furniture. The lowest spending school district spent zero on Rentals, zero on Repair of Buildings, $10 per student on General Supplies, and $2

per student on Equipment and Furniture. The high spending school district has an average of 164 students per attendance center and the low spending school district has an average of 429 enrollment.

The difference in $525 per student and $85 per student cannot be attributed to school district size, but to one school district spending a greater amount of money in a greater number of categories than the other school district.

19. Attendance centers of equal enrollment size located in different school districts can have unequal expenditures. The data indicate that expenditures for attendance centers are dependent upon the size of school district in which the attendance center is located.

20. A greater portion of a large school district's non-salary related operations and maintenance budget is consumed by electricity costs than a small school district's. The percentage of electricity cost per pupil to non-salary related operations and maintenance cost per pupil ranges from 8.5 percent for a small school district to 52 percent for a large district.

Specific Answers to the Research Questions

The research questions to be explored were:

1. Is there a relationship between school district enrollment size and expenditure levels?

   From the analysis of five years of non-salary related data and school district size the results indicated the following:

   (1) There is a relationship between school district enrollment size and expenditure levels with variables that are related to past expenditure history; and

   (2) There is no significant relationship between non-salary related expenditures per pupil and school district enrollment size when the non-salary related expenditures are not related to past expenditure history.

2. Are differences in school district expenditures due to enrollment size or to other factors?

   From the analysis of five years of non-salary related data, the results indicate that differences in non-salary related school district expenditures are due to school district spending greater per student amounts relative to other school districts and not to school district size.

On the surface, there appears to be a size factor related to expenditure levels, but by examining the component parts, the data indicate that high expenditure school districts have spend greater amounts per pupil in a greater number of the 21 operations and maintenance categories than school districts that have low expenditures. many of the low expenditure school districts have recorded zero amounts or low dollar amounts in many of the 21 operations and maintenance areas. School district size is not a significant factor, other than low enrollment school districts may have had a greater amount of funds to spend per pupil than high enrollment school districts.

3. At what school district enrollment size does economy of scale account for a difference in expenditures?

There does not appear to be a significant relationship between non-salary related expenditures and school district size. Examining salary related expenditures was beyond the bounds of this study.

The minimum enrollment size required for a school district to support an equivalent educational program offered by a majority of the school districts in the state was addressed in this study.

From the analysis of three years of certified personnel data, it was found that for a student ratio of 6 students to 1 certified instructional personnel, a minimum of 96 enrollment would be required to support 16 certified instructional personnel, the required number to provide an equivalent educational program similar to one provided by a majority of the school districts in the state.

For a student to certified staff ratio of 10.9 to 1, the minimum enrollment size required for a school district to support 16 certified instructional staff would be 174.4.

Recommendations

The consultants conducted separate analyses of data. Dr. Bass focused on the literature and qualitative data while Dr. Hughes was dealing with the quantitative data. From these analysis activities, two sets of recommendations were developed. These are presented below, beginning with the recommendations from the qualitative analysis followed by those from the quantitative analysis.

Recommendations from the Qualitative Analysis

1. While the review of literature and the interviews identified a very wide range of criteria for definition of "small," including sizes far in excess of 1,900, it would seem unlikely that such a large proportion of a state's school districts would be identified as such. The Kansas legislature should therefore change the terminology of "low enrollment" to "district size." The low enrollment weighting is really a misnomer. If it is assumed that there is a continuum of district sizes from small to large, the criterion in Kansas certainly skews the categorization. On the other hand, there appears to have been an historical basis for providing greater funding per pupil to those school districts with up to 1,900 students. The legislature can take a step toward clearing up the confusion over the designation of low enrollment by changing the terminology. Certainly, some critics would complain that the legislature was engaged in an exercise in semantics, but the consultant believes that such a change would be an effort toward "truth in advertising" by

calling the factor what it really is, a mechanism that provides varying levels of funding according to district size.

2. Any possible consideration of change in the criterion of 1,900 students for the low enrollment weighting should be accompanied by a hold-harmless provision which would allow time (up to 3-5 years) for leaders in school districts which would lose funding to make adjustments in their budgets and programs or to seek voter approval of LOB authority to compensate for such loss.

3. The Kansas legislature should at some future date consider whether to link the LOB with the low enrollment weighting to provide a state-local split in the funding, particular for those school districts which are not isolated. The literature and the experience of other states indicate that there is considerable conceptual, if not political, support for limiting the state's obligation for funding small school districts that remain small through local choice rather than because of low population density. Continuing to provide the low enrollment weighting to all small districts provides a financial disincentive to such districts which might otherwise consider a reorganization. By establishing a geographical isolation factor and holding non-isolated districts locally responsible, at least in part, for the supplemental funding, the legislature could reduce the state's cost of this portion of the financing plan, eliminate or reduce the financial disincentive to school district reorganization, allow non-isolated small districts to continue in operation at the option (and expense) of the local residents, and ensure that all schoolchildren of the state are provided with a minimum, quality educational program.

Recommendations from the Quantitative Analysis

1. Because non-salary related operations and maintenance cost per pupil varies across the school districts and electricity cost per pupil remains constant, an adjustment to operations and maintenance cost is recommended based on the median percentage of electricity costs per pupil to non-salary related operations and maintenance costs per pupil. All school districts that have above the median percentage of electricity costs to non-salary related operations and maintenance costs, based on a five year average, would have an adjustment to non-salary related operations and maintenance funding.

2. Low enrollment weighting would be set at the minimum school district size that would support 16 certified instructional staff required for an equivalent educational program provided by a majority of the school districts in the state.

   For example, if the state legislature chose to establish a student to certified instructional personnel ratio of 6 to 1, the minimum school district size would be 96 enrollment. School districts with less than 96 enrollment would receive low enrollment weighting funds.

   The majority of the low enrollment weighting funds would be equally distributed on a per pupil basis across the school districts of the state. The base amount of $3,600 per pupil would be increased in equal per pupil amounts for all the school districts.

3. From the quantitative analysis of this study, the data have indicated that non-salary related expenditures are not a function of school district

size. Therefore, only salary related expenditures should be allocated through the present low enrollment weighting formula. The remaining amount of low enrollment weighting funds should be allocated in equal per pupil amounts to all school districts in the state.

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Appendix A

Transfers include Adult Education, Adult Supplemental Education, Bilingual Education, Capital Outlay, Driver Training, Education Excellence Grant Program, Food Service, Inservice Education, Parent Education Program, Summer School, Special Education, Technology Education, Transportation, Vocational Education, Area Vocational School, Disability Income Benefits Reserve, Health Care Services Reserve, Risk Management Reserve, School Workers' Compensation Reserve, Coop Data Processing, and Coop Elementary Guidance, and Contingency Reserve. The Contingency Reserve limit is one (1) percent of general fund legal maximum budget prior to July 1, 1993 and two (2) percent thereafter (Source: State of Kansas, Budget Form USD-E 1993-94).

Appendix B

Percentage Increase in Per Pupil Expenditure
by Category, 1991-92 to 1992-93

Expenditure Category	Per Pupil Expenditures 92-93	91-92	Percentage Increase
1. Instructional	$2,395	$2,199	8.9
2. Operation & Maintenance	585	527	11.0
3. School Administration	304	284	7.0
4. General Administration	168	160	5.0
5. Instructional Support	161	142	13.4
6. Student Support	144	123	17.0
7. Other Support	92	79	16.4
8. CS, SA, A&E	48	43	11.6
Totals	3,897	3,556	9.58

Data Source: Kansas State Board of Education, 1992-93 & 1991-92 Data

Appendix C

Correlation Matrices

Following are definitions for the coded variables used in the correlation matrices:

Code for the following variables in the correlation matrix:
OM5YR621 - Five Year Average Heating Costs/Pupil
OM5YR622 - Five Year Average Electricity Costs/Pupil
DENSITY - Land Area in Square Miles divided by Enrollment
AREASQMI - Land Area in Square Miles
TXP9394 - Total Expenditures & Transfers/Pupil 1993-94
PBLD9394 - Average Number of Pupils per Attendance Center, 1993-94
PBUS9394 - Percentage of Students Bussed Greater than 2.5 miles, 1993-94
NSAL5YROM - Five Year Average Non-Salary Operations & Maintenance/Pupil
SAL5YROM - Five Year Average Salary Related Operations & Maintenance/Pupil
TOM89994P - Five Year Average Total Operations & Maintenance/Pupil
FTEE5YR - Five Year Average Full Time Equivalent Enrollment
EXPTRP5YR - Five Year Average Total Expenditures & Transfers/Pupil
Five Year Average: 1989-90, 1990-91, 1991-92, 1992-93, 1993-94

Pearson Correlations

	OM5YR621	OM5YR622	DENSITY	AREASQMI	TXP9394	PBLD9394	PBUS9394	NSAL5YOM
OM5YR621	1.00000	0.23372	-0.19066	0.26731	0.72358	-0.61220	0.13416	0.53666
OM5YR622	0.23372	1.00000	-0.14571	0.12252	0.37203	-0.19052	0.04848	0.41724
DENSITY	-0.19066	-0.14571	1.00000	-0.29253	-0.31833	0.42022	-0.26345	-0.28582
AREASQMI	0.26731	0.12252	-0.29253	1.00000	0.16864	-0.26866	0.07748	0.06266
TXP9394	0.72358	0.37203	-0.31833	0.16864	1.00000	-0.77151	0.28244	0.68137
PBLD9394	-0.61220	-0.19052	0.42022	-0.26866	-0.77151	1.00000	-0.20382	-0.53617
PBUS9394	0.13416	0.04848	-0.26345	0.07748	0.28244	-0.20382	1.00000	0.25846
NSAL5YOM	0.53666	0.41724	-0.28582	0.06266	0.68137	-0.53617	0.25846	1.00000
SAL5YROM	0.54972	0.42128	0.09492	0.14728	0.48546	-0.32069	-0.09527	0.27097
TOM8994P	0.66106	0.51189	-0.18716	0.11269	0.74961	-0.56373	0.16523	0.91193
FTEE5YR	-0.23054	-0.10652	0.77794	-0.15929	-0.33445	0.42297	-0.20916	-0.31420
EXPTRP5Y	0.74764	0.42044	-0.29417	0.16228	0.96261	-0.73431	0.22073	0.66979

Pearson Correlations

	SAL5YROM	TOM8994P	FTEE5YR	EXPTRP5Y
OM5YR621	0.54972	0.66106	-0.23054	0.74764
OM5YR622	0.42128	0.51189	-0.10652	0.42044
DENSITY	0.09492	-0.18716	0.77794	-0.29417
AREASQMI	0.14728	0.11269	-0.15929	0.16228
TXP9394	0.48546	0.74961	-0.33445	0.96261
PBLD9394	-0.32069	-0.56373	0.42297	-0.73431
PBUS9394	-0.09527	0.16523	-0.20916	0.22073
NSAL5YOM	0.27097	0.91193	-0.31420	0.66979
SAL5YROM	1.00000	0.64211	0.07099	0.56563
TOM8994P	0.64211	1.00000	-0.21997	0.77456
FTEE5YR	0.07099	-0.21997	1.00000	-0.31368
EXPTRP5Y	0.56563	0.77456	-0.31368	1.00000

Spearman Correlations
(Rank Order Correlation Coefficients)

	SAL5YROM	TOM8994P	FTEE5YR	AVP5YR	EXPTRP5Y
OM5YR621	0.39611	0.58419	-0.71247	0.61100	0.72799
OM5YR622	0.41623	0.52134	-0.33362	0.40327	0.44289
DENSITY	-0.34485	-0.59291	0.82428	-0.72757	-0.81105
AREASQMI	0.20158	0.19767	-0.25169	0.56212	0.30552
TXP9394	0.36035	0.73829	-0.96197	0.60531	0.95778
PBLD9394	-0.32856	-0.61229	0.87167	-0.53314	-0.84999
PBUS9394	-0.11728	0.18435	-0.27719	0.05665	0.25000
NSAL5YOM	0.25426	0.92868	-0.70837	0.37570	0.73516
SAL5YROM	1.00000	0.55893	-0.28776	0.51797	0.44463
TOM8994P	0.55893	1.00000	-0.69105	0.48801	0.77151
FTEE5YR	-0.28776	-0.69105	1.00000	-0.53852	-0.92769
AVP5YR	0.51797	0.48801	-0.53852	1.00000	0.64637
EXPTRP5Y	0.44463	0.77151	-0.92769	0.64637	1.00000

Five Year Average Data (1989-90 to 1993-94)

Spearman Correlations
(Rank Order Correlation Coefficients)

	OM5YR621	OM5YR622	DENSITY	AREASQMI	TXP9394	PBLD9394	PBUS9394	NSAL5YOM
OM5YR621	1.00000	0.22947	-0.76922	0.44689	0.72103	-0.72866	0.14803	0.54256
OM5YR622	0.22947	1.00000	-0.33862	0.14040	0.38960	-0.24152	0.09872	0.47148
DENSITY	-0.76922	-0.33862	1.00000	-0.71708	-0.83059	0.78924	-0.28322	-0.57754
AREASQMI	0.44689	0.14040	-0.71708	1.00000	0.30230	-0.34242	0.16271	0.16941
TXP9394	0.72103	0.38960	-0.83059	0.30230	1.00000	-0.87017	0.32639	0.73151
PBLD9394	-0.72866	-0.24152	0.78924	-0.34242	-0.87017	1.00000	-0.28291	-0.59934
PBUS9394	0.14803	0.09872	-0.28322	0.16271	0.32639	-0.28291	1.00000	0.27887
NSAL5YOM	0.54256	0.47148	-0.57754	0.16941	0.73151	-0.59934	0.27887	1.00000
SAL5YROM	0.39611	0.41623	-0.34485	0.20158	0.36035	-0.32856	-0.11728	0.25426
TOM8994P	0.58419	0.52134	-0.59291	0.19767	0.73829	-0.61229	0.18435	0.92868
FTEE5YR	-0.71247	-0.33362	0.82428	-0.25169	-0.96197	0.87167	-0.27719	-0.70837
AVP5YR	0.61100	0.40327	-0.72757	0.56212	0.60531	-0.53314	0.05665	0.37570
EXPTRP5Y	0.72799	0.44289	-0.81105	0.30552	0.95778	-0.84999	0.25000	0.73516

Pearson Correlations

	OM621P94	OM622P94	TOMP9394	NSAL94OM	PBLD9394	PBUS9394
OM5YR621	0.96388	0.23219	0.46165	0.32207	-0.61220	0.13416
OM5YR622	0.21602	0.95148	0.35132	0.24218	-0.19052	0.04848
FTEE9394	-0.23868	-0.12531	-0.22691	-0.26838	0.43545	-0.20948
AVPU9394	0.23604	0.51996	0.20251	0.09193	-0.18662	-0.06512
DENSITY	-0.17649	-0.17270	-0.18960	-0.24160	0.42022	-0.26345
AREASQMI	0.25941	0.13495	0.07050	0.02754	-0.26866	0.07748
AV5YRAVG	-0.17674	0.03370	-0.14922	-0.20175	0.34714	-0.19453
TXP9394	0.70413	0.38663	0.65098	0.53312	-0.77151	0.28244
OM621P94	1.00000	0.21778	0.46046	0.32325	-0.60932	0.08760
OM622P94	0.21778	1.00000	0.36146	0.25859	-0.21510	0.07687
TOMP9394	0.46046	0.36146	1.00000	0.94683	-0.49882	0.21087
NSAL94OM	0.32325	0.25859	0.94683	1.00000	-0.43006	0.24340
PBLD9394	-0.60932	-0.21510	-0.49882	-0.43006	1.00000	-0.20382
PBUS9394	0.08760	0.07687	0.21087	0.24340	-0.20382	1.00000

1993-94 Data

Pearson Correlations

	OM5YR621	OM5YR622	FTEE9394	AVPU9394	DENSITY	AREASQMI	AV5YRAVG	TXP9394
OM5YR621	1.00000	0.23372	-0.23624	0.25449	-0.19066	0.26731	-0.17158	0.72358
OM5YR622	0.23372	1.00000	-0.10588	0.60441	-0.14571	0.12252	0.07237	0.37203
FTEE9394	-0.23624	-0.10588	1.00000	-0.07038	0.77878	-0.16280	0.92305	-0.34005
AVPU9394	0.25449	0.60441	-0.07038	1.00000	-0.08136	0.18176	0.18206	0.35175
DENSITY	-0.19066	-0.14571	0.77878	-0.08136	1.00000	-0.29253	0.70416	-0.31833
AREASQMI	0.26731	0.12252	-0.16280	0.18176	-0.29253	1.00000	-0.09134	0.16864
AV5YRAVG	-0.17158	0.07237	0.92305	0.18206	0.70416	-0.09134	1.00000	-0.22919
TXP9394	0.72358	0.37203	-0.34005	0.35175	-0.31833	0.16864	-0.22919	1.00000
OM621P94	0.96388	0.21602	-0.23868	0.23604	-0.17649	0.25941	-0.17674	0.70413
OM622P94	0.23219	0.95148	-0.12531	0.51996	-0.17270	0.13495	0.03370	0.38663
TOMP9394	0.46165	0.35132	-0.22691	0.20251	-0.18960	0.07050	-0.14922	0.65098
NSAL94OM	0.32207	0.24218	-0.26838	0.09193	-0.24160	0.02754	-0.20175	0.53312
PBLD9394	-0.61220	-0.19052	0.43545	-0.18662	0.42022	-0.26866	0.34714	-0.77151
PBUS9394	0.13416	0.04848	-0.20948	-0.06512	-0.26345	0.07748	-0.19453	0.2824

Spearman Correlations

	OM621P94	OM622P94	TOMP9394	NSAL94OM	PBLD9394	PBUS9394
OM5YR621	0.96458	0.23647	0.50413	0.46759	-0.72866	0.14803
OM5YR622	0.20354	0.95173	0.41501	0.35265	-0.24152	0.09872
FTEE9394	-0.70071	-0.35873	-0.66972	-0.65888	0.87442	-0.27611
AVPU9394	0.57733	0.38155	0.38563	0.29311	-0.52794	0.07390
DENSITY	-0.74136	-0.35141	-0.55926	-0.53693	0.78924	-0.28322
AREASQMI	0.43115	0.15220	0.17929	0.16704	-0.34242	0.16271
AV5YRAVG	-0.37344	-0.14021	-0.52322	-0.57867	0.62422	-0.29253
TXP9394	0.70822	0.41513	0.71485	0.68150	-0.87017	0.32639
OM621P94	1.00000	0.22069	0.50987	0.46895	-0.72488	0.10536
OM622P94	0.22069	1.00000	0.44281	0.38103	-0.25979	0.10494
TOMP9394	0.50987	0.44281	1.00000	0.94737	-0.55825	0.22327
NSAL94OM	0.46895	0.38103	0.94737	1.00000	-0.53502	0.26995
PBLD9394	-0.72488	-0.25979	-0.55825	-0.53502	1.00000	-0.28291
PBUS9394	0.10536	0.10494	0.22327	0.26995	-0.28291	1.00000

1993-94 Data

Spearman Correlations
(Rank Order Correlation Coefficients)

	OM5YR621	OM5YR622	FTEE9394	AVPU9394	DENSITY	AREASQMI	AV5YRAVG	TXP9394
OM5YR621	1.00000	0.22947	-0.71406	0.60072	-0.76922	0.44689	-0.37212	0.72103
OM5YR622	0.22947	1.00000	-0.33380	0.40420	-0.33862	0.14040	-0.10319	0.38960
FTEE9394	-0.71406	-0.33380	1.00000	-0.53204	0.82526	-0.25630	0.75757	-0.96574
AVPU9394	0.60072	0.40420	-0.53204	1.00000	-0.71178	0.54740	0.07744	0.60438
DENSITY	-0.76922	-0.33862	0.82526	-0.71178	1.00000	-0.71708	0.42846	-0.83059
AREASQMI	0.44689	0.14040	-0.25630	0.54740	-0.71708	1.00000	0.11292	0.30230
AV5YRAVG	-0.37212	-0.10319	0.75757	0.07744	0.42846	0.11292	1.00000	-0.67836
TXP9394	0.72103	0.38960	-0.96574	0.60438	-0.83059	0.30230	-0.67836	1.00000
OM621P94	0.96458	0.20354	-0.70071	0.57733	-0.74136	0.43115	-0.37344	0.70822
OM622P94	0.23647	0.95173	-0.35873	0.38155	-0.35141	0.15220	-0.14021	0.41513
TOMP9394	0.50413	0.41501	-0.66972	0.38563	-0.55926	0.17929	-0.52322	0.71485
NSAL94OM	0.46759	0.35265	-0.65888	0.29311	-0.53693	0.16704	-0.57867	0.68150
PBLD9394	-0.72866	-0.24152	0.87442	-0.52794	0.78924	-0.34242	0.62422	-0.87017
PBUS9394	0.14803	0.09872	-0.27611	0.07390	-0.28322	0.16271	-0.29253	0.32639

Appendix D

Assessed Valuation Per Pupil in Kansas School Districts,
Five-Year Average (1989-90 to 1993-94),
By School District Size

School District Size	Student Count	**Mean Valuation**	Standard Deviation	Minimum Valuation	Maximum Valuation
≤ 100	468	**85,251**	30,900	52,265	124,691
101 - 200	5,382	**83,120**	84,657	31,642	449,125
201 - 300	7,313	**43,990**	20,428	16,898	99,524
301 - 400	11,506	**53,228**	46,568	15,594	258,749
401 - 500	15,531	**32,912**	16,470	14,573	95,219
501 - 600	10,746	**46,037**	31,221	17,269	140,399
601 - 700	14,824	**26,088**	9,972	8,268	50,746
701 - 800	10,812	**44,196**	53,536	14,494	201,185
801 - 900	11,150	**31,342**	30,422	13,515	136,041
901 - 1,000	7,463	**116,419**	182,426	14,823	567,165
1,001 - 2,000	65,616	**30,310**	30,852	13,090	221,050
2,001 - 3,000	31,807	**22,206**	3,670	16,792	31,329
3,001 - 4,000	33,491	**23,773**	5,408	16,297	31,541
4,001 - 6,000	22,379	**26,146**	4,955	19,722	34,462
6,001 - 9,000	41,120	**25,019**	7,742	11,826	36,957
9,001 - 20,000	38,565	**37,811**	11,724	30,876	57,861
≥ 20,001	95,701	**35,867**	11,352	20,033	50,946
Five Year Average		**34,136**			
Median		**27,359**			

Appendix E

Total Expenditures & Transfers Per Pupil,
Five Year Average (1989-90 to 1993-94),
By School District Size

School District Size	Student Count	**Mean Expenditure**	Standard Deviation	Minimum Expenditure	Maximum Expenditure
≤ 100	468	**8,215**	1,103	7,097	9,895
101 - 200	5,382	**6,814**	900	5,185	9,251
201 - 300	7,313	**5,654**	324	5,079	6,635
301 - 400	11,506	**5,425**	364	4,462	6,382
401 - 500	15,531	**5,164**	289	4,481	5,960
501 - 600	10,746	**5,088**	350	4,612	6,034
601 - 700	14,824	**4,820**	217	4,297	5,213
701 - 800	10,812	**4,871**	290	4,451	5,659
801 - 900	11,150	**4,825**	231	4,267	5,189
901 - 1,000	7,463	**4,749**	252	4,488	5,257
1,001 - 2,000	65,616	**4,108**	396	**2,868**	5,298
2,001 - 3,000	31,807	**3,522**	179	3,290	3,962
3,001 - 4,000	33,491	**3,601**	171	3,353	4,002
4,001 - 6,000	22,379	**3,472**	90	3,380	3,632
6,001 - 9,000	41,120	**3,541**	145	3,406	3,781
9,001 - 20,000	38,565	**4,166**	309	3,799	4,581
≥ 20,001	95,701	**3,988**	152	3,820	4,201
Five Year Average		**4,153**			
Median		**3,922**			

Appendix F

Adjusted Non-Salary Operations & Maintenance Costs per Pupil

The following two pages contain data related to Adjusted Non-Salary Operations & Maintenance Costs per Pupil. Codes used in the tables are defined below.

1 = DIST	School district identification number
2 = ELECT/PUP 5 YR AVG	Actual electricity costs per pupil over a five year period (1989-90 to 1993-94).
3 = ELECT % NSAL	Actual Electricity Costs per Pupil as a percentage of Non-Salary Related Operations & Maintenance Costs per Pupil.
4 = NSAL 5 YR AVG ACTUAL	Actual Non-Salary Related Operations and Maintenance Costs per Pupil, five year average.
5 = PROJ NSAL	Adjusted Non-Salary Operations & Maintenance Costs for School Districts having a five year average electricity costs per pupil greater than 30.6% of Non-Salary Operations & Maintenance Costs.
6 = Diff PROJ-ACTUAL	The difference in the Adjusted Non-Salary O&M/Pupil and the Actual Non-Salary O&M/Pupil.
7 = DIFF * 93-94 FTEE	**Difference in Adjusted Non-Salary O&M/Pupil and Actual Non-Salary O&M/Pupil times 1993-94 full time equivalent enrollment.**
8 = DIFF * 5 YR FTEE	Difference in Adjusted Non-Salary O&M/Pupil and Actual Non-Salary O&M/Pupil times five year average full time equivalent enrollment.
9 = FTEE 5 YR	Five year average full time equivalent enrollment.
10 = FTEE 93-94	Full time equivalent enrollment 1993-94.
11 = AV 5 YR AVG	Five Year Average Assessed Valuation of Property Per Pupil (1989-90 to 1993-94).

Appendix F
Adjusted Non-Salary Operations & Maintenance / Pupil

Projected Increase in Non-Salary Operations & Maintenance Revenue
Based on the Median .3261314 percent Electricity Costs/Pupil to Non-Salary O&M Costs/Pupil

	DIST #	ELECT/PUP 5 YR AVG	ELECT % NSAL	NSAL 5 YR AVG ACTUAL	PROJ NSAL	DIFF PROJ - ACTUAL	DIFF * 94-94 FTEE	DIFF * 5 YR FTEE	FTEE 93-94	FTEE 5 YR AVG	AV 5 YR AVG	AVG # ATTENDANC CENTER
1	259	95.12	44.50	213.76	291.65	77.89	3,488,688	3,496,261	44,792	44,889	33,329	415
2	512	99.48	51.86	191.83	305.03	113.20	3,456,873	3,363,209	30,537	29,710	50,946	536
3	233	108.85	40.91	266.07	333.77	67.69	1,071,686	989,861	15,832	14,623	31,031	511
4	500	70.89	36.88	192.20	217.35	25.16	528,316	530,833	21,002	21,102	20,035	429
5	437	107.44	46.34	231.83	329.42	97.60	457,793	410,699	4,691	4,208	34,462	586
7	250	120.46	52.46	229.63	369.36	139.73	413,456	400,146	2,959	2,864	19,899	423
8	480	84.94	44.76	189.77	260.46	70.69	268,893	252,521	3,804	3,572	30,724	380
9	373	89.46	41.86	213.74	274.32	60.58	210,055	200,763	3,467	3,314	19,626	315
10	229	130.00	34.13	380.95	398.61	17.66	204,355	173,569	11,570	9,827	57,861	551
12	261	81.11	42.08	192.74	248.63	55.95	200,464	192,403	3,583	3,439	16,297	597
14	385	96.74	48.28	200.40	296.64	96.24	191,474	169,051	1,990	1,757	23,592	497
15	457	64.38	37.90	169.89	197.42	27.53	185,662	176,392	6,745	6,408	25,725	397
16	313	111.85	42.31	264.38	342.96	78.58	172,787	169,835	2,199	2,161	25,403	367
17	234	89.96	45.25	198.79	275.84	77.05	162,182	159,707	2,105	2,073	19,345	526
18	368	144.03	40.87	352.40	441.63	89.22	158,428	148,063	1,776	1,659	23,421	355
20	446	80.69	42.72	188.88	247.41	58.53	136,202	136,137	2,327	2,326	23,583	465
21	262	111.59	39.52	282.36	342.18	59.81	128,412	125,067	2,147	2,091	18,063	429
22	265	104.92	38.57	272.00	321.70	49.69	116,724	105,666	2,349	2,126	22,969	587
23	416	138.51	42.55	325.55	424.69	99.15	113,027	109,804	1,140	1,108	23,672	285
26	460	155.19	43.12	359.90	475.84	115.94	91,647	88,603	791	764	26,975	264
28	263	45.31	47.68	95.02	138.93	43.91	84,228	82,454	1,918	1,878	13,090	480
29	470	81.18	36.46	222.68	248.91	26.23	79,827	80,201	3,043	3,057	20,040	338
30	440	168.97	39.61	426.54	518.11	91.57	67,669	69,456	739	759	25,251	246
32	466	104.00	40.07	259.55	318.90	59.35	63,658	63,105	1,073	1,063	39,402	268
34	331	118.61	37.61	315.38	363.67	48.29	59,273	54,863	1,227	1,136	44,832	307
35	335	188.85	42.58	443.48	579.06	135.58	55,792	56,850	412	419	20,237	206
36	447	146.09	40.35	362.10	447.95	85.86	55,292	53,983	641	629	15,344	161
37	461	119.76	40.44	296.13	367.23	71.09	54,017	51,953	760	731	18,398	253
38	450	78.86	34.86	226.24	241.80	15.56	52,596	52,235	3,381	3,357	22,931	483
39	482	217.77	39.97	544.89	667.72	122.83	49,785	48,937	405	398	48,367	135
40	413	76.53	36.37	210.44	234.65	24.21	48,307	46,995	1,995	1,941	17,438	285
41	368	186.63	41.99	444.51	572.27	127.76	47,935	47,519	375	372	44,230	188
42	353	72.88	36.35	200.47	223.46	22.99	46,628	45,771	2,028	1,991	19,270	290
43	268	93.19	42.75	217.97	285.74	67.77	45,148	39,782	666	587	22,771	222
44	375	101.88	36.35	280.25	312.39	32.14	44,502	42,152	1,385	1,311	39,720	346
45	205	112.66	38.41	293.34	345.46	52.12	42,924	40,376	824	775	22,822	206
46	231	110.20	34.96	315.20	337.90	22.70	40,950	38,465	1,804	1,694	29,928	451
47	389	91.06	38.91	234.01	279.20	45.19	38,379	36,209	849	801	27,901	212
48	386	158.80	40.19	395.07	486.92	91.84	27,222	26,131	296	285	35,350	148
49	285	176.63	45.39	389.11	541.53	152.48	26,531	27,962	174	183	41,623	87
50	469	65.49	34.60	189.26	200.81	11.55	22,132	20,053	1,916	1,736	16,873	383

Appendix F
Adjusted Non-Salary Operations & Maintenance / Pupil

Projected Increase in Non-Salary Operations & Maintenance Revenue
Based on the Median .3261314 percent Electricity Costs/Pupil to Non-Salary O&M Costs/Pupil

	DIST #	ELECT/PUP 5 YR AVG	ELECT % NSAL	NSAL 5 YR AVG ACTUAL	PROJ NSAL	DIFF PROJ - ACTUAL	DIFF * 94-94 FTEE	DIFF * 5 YR FTEE	FTEE 93-94	FTEE 5 YR AVG	AV 5 YR AVG	AVG # ATTENDANCE CENTER
51	438	128.87	38.28	336.69	395.15	58.47	21,692	20,861	371	357	57,162	186
53	471	176.83	41.59	425.21	542.20	116.99	21,268	19,191	182	164	35,747	91
54	260	88.65	32.98	268.77	271.84	3.06	18,977	18,177	6,198	5,937	22,154	563
55	206	144.28	34.97	412.57	442.39	29.82	16,401	15,334	550	514	37,366	183
56	407	73.33	34.50	212.53	224.84	12.30	14,821	14,677	1,205	1,193	45,467	151
57	310	142.62	35.01	407.36	437.32	29.96	14,304	14,089	478	470	50,977	119
58	200	162.07	35.38	458.08	496.94	38.86	13,698	13,710	353	353	75,658	176
59	435	60.59	34.17	177.30	185.78	8.47	12,536	11,983	1,480	1,414	21,236	296
61	255	190.99	34.27	557.24	585.62	28.38	10,132	9,367	357	330	62,490	119
62	330	200.03	33.49	597.35	613.33	15.98	9,845	9,579	616	599	25,080	154
63	337	92.35	33.91	272.35	283.18	10.84	8,912	8,599	823	794	13,515	274
64	428	52.00	33.16	156.83	159.44	2.61	8,872	8,789	3,394	3,362	26,068	377
65	358	119.54	33.79	353.72	366.53	12.81	5,962	5,690	466	444	23,035	233
66	303	119.21	33.63	354.49	365.52	11.02	3,941	3,905	358	354	56,006	179
67	361	145.64	32.88	442.96	446.57	3.62	3,809	3,858	1,053	1,066	35,367	351
68	468	148.89	34.69	429.15	456.54	27.38	3,204	2,957	117	108	76,749	59
69	325	91.66	33.12	276.75	281.06	4.32	3,148	3,045	729	705	30,909	243
70	430	87.50	33.09	264.46	268.28	3.83	2,671	2,556	698	668	20,715	233
							13,004,109	12,610,412	211,141	203,958		

GREATER THAN 101,000 ASSESSED VALUATION/PUPIL AND GREATER THAN 32.6%

	DIST #	ELECT/PUP 5 YR AVG	ELECT % NSAL	NSAL 5 YR AVG ACTUAL	PROJ NSAL	DIFF PROJ - ACTUAL	DIFF * 94-94 FTEE	DIFF * 5 YR FTEE	FTEE 93-94	FTEE 5 YR AVG	AV 5 YR AVG	AVG # ATTENDANCE CENTER
6	244	336.01	58.75	571.94	1,030.28	458.33	446,874	418,210	975	912	567,165	325
13	363	244.09	51.15	477.21	748.43	271.21	197,308	186,243	728	687	162,801	364
19	214	121.01	43.42	278.69	371.03	92.35	156,905	152,358	1,699	1,650	134,926	340
24	362	167.97	43.09	389.79	515.04	125.25	111,150	106,200	887	848	136,041	177
25	321	173.50	39.23	442.26	531.99	89.73	92,327	90,748	1,029	1,011	221,050	172
27	215	175.11	41.55	421.48	536.94	115.46	84,781	79,045	734	685	201,185	245
31	507	202.83	45.73	443.58	621.93	178.35	66,258	65,502	372	367	258,749	186
33	216	194.63	46.44	419.06	596.77	177.71	60,014	53,197	338	299	167,862	113
52	209	206.80	40.21	514.29	634.11	119.82	21,627	19,341	181	161	449,125	90
60	494	115.96	35.57	326.05	355.57	29.52	11,764	11,992	399	406	102,879	199
							1,249,008	1,182,834	7,341	7,027		

Appendix G

Use of Instructional Units in Alaska and Wyoming

Alaska 1994 - The Alaska School Foundation Funding Program, January 1994.

Basic Need = (Instructional Units) x (Area Cost Differential) x ($61,000)

The Foundation Program is based on the "instructional unit" method of funding. The department shall adopt regulations defining funding communities within each district which reflect geographic and attendance area factors.

The total number of instructional units in a school district is the sum of the number of units for: elementary and secondary students, vocational education, special education, and bilingual education.

Area Cost Differential is a factor multiplied by a school district's instructional units to adjust for costs associated with geographic conditions, sparsity and location of various school districts. Such factors vary between 1.0 and 1.46, usually depending on remoteness of the district.

Allowable Instructional Units (Chapter 17, Article 1, Sec. 14.17.031, 1994 Alaska Education Laws) (a) The department shall adopt regulations defining funding communities within each district which reflect geographic and attendance area factors.

Elementary and Secondary Instructional Units (Sec. 14.17.041)

(a) for funding communities that have an average daily membership of less than 200 in grades K-6 or less than 200 in grades 7-12, combined elementary and secondary instructional units are determined under the following table:

ADM	Units
1- 10	2
11- 20	$2 + \frac{(ADM - 10)}{5}$
21- 60	$4 + \frac{(ADM - 20)}{8}$
61-120	$9 + \frac{(ADM - 60)}{12}$
121-525	$\frac{14 + (ADM - 120)}{15}$

Elementary Instructional units for funding communities with more than 200 students in grades K-6 are determined by the formula:

$$Units = 15 + \frac{(ADM - 200)}{17}$$

Secondary Instructional units for funding communities with more than 200 students in grades 7-12 are determined by the formula:

$$\text{Units} = 18 + \frac{(\text{ADM} - 200)}{13}$$

- -

Wyoming - (Wyoming Education Code of 1969) Classroom Units based on average daily membership in accordance with the following table:

Elementary Schools:

ADM	Divisor	Minimum Units
Less than 10	8	1.00
= 10 < 27	8	1.20
= 27 < 44	12	3.25
= 44 < 76	14	3.60
= 76 < 151	16	5.36
= 151 < 301	19	9.38
= 301 < 501	22	15.79
= 501 and over	23	22.73

Junior High Schools:

ADM	Divisor	Minimum Units
Less than 51	13	2.00
= 51 < 151	15	3.85
= 151 < 301	18	10.00
= 301 < 501	21	16.67
= 501 and over	23	23.81

High Schools:

ADM	Divisor	Minimum Units
Less than 76	10	-
= 76 < 151	14	7.40
= 151 < 301	17	10.71
= 301 < 501	20	17.65
= 501 and over	23	25.00

The amount to be included in the foundation program of a district for general operation expense shall be determined by multiplying the number of classroom units allotted to a district $92,331.00.

Appendix H

Percentage of School Districts With Various Categories of Non-Certified Personnel (3 Year Average), 1991-92, 1992-93, 1993-94

Category	% School Districts w/Category, 3 Year Avg	1991-92 # School Districts With	1992-93 # School Districts With	1993-94 # School Districts With
Asst. Supt	2%	7	6	5
Business Mgr	16%	50	50	50
Business SVC Dir	22%	70	69	65
Business SVC Oth	47%	154	139	139
Maint Oper Dir	* 56%	170	166	175
Maint Oper Other	* 96%	288	299	292
Food SVC Dir	44%	130	132	144
Food SVC Other	* 97%	291	296	294
Transp Director	43%	127	128	136
Transp Other	* 83%	249	257	249
Other Director	10%	23	32	33
Attend SVC Staff	8%	21	27	25
Lib. Media Aid	* 65%	193	201	201
Nurse LPN	22%	58	66	79
Sec Officer	7%	22	22	22
Soc SVC Staff	2%	7	5	5
Reg Educ Aids	* 78%	231	239	241
Coach Asst	37%	114	111	111
Clerical C-Admin	* 87%	287	249	252
Clerical S-Admin	* 87%		252	277
Clerical Student	32%		95	103
Spec Para	33%	102	98	97
Other	32%	96	94	104

Total Non-Certified Personnel:

1991-92	17,059
1992-93	18,102
1993-94	19,019

In 1993-94, 77 percent of total non-certified personnel was composed of Operations and Maintenance personnel (25 percent), Food Service (19 percent), Clerical (19 percent) and Transportation (14 percent).

A majority of the school districts have an Operations and Maintenance Director (56 percent), Operations and Maintenance personnel (96.4 percent), Food Service personnel (96.6 percent), Transportation personnel (83 percent), Library Media Aid (65 percent), Regular Education Aids (78 percent), and Clerical personnel (87 percent).

Appendix I

On the following five pairs of pages, Kansas school districts are ranked from high to low on Non-Salary Operations and Maintenance cost per pupil, less Heat and Electricity costs per pupil. The first page of each pair displays the per-pupil costs for each of the 21 Operations and Maintenance categories and Total O&M. The second page of each set is used to report demographic data for the same school districts as on the first page.

Tables 8 and 9 contained information related to the following pages.

The 21 O&M categories are listed in Table 8 by the following category numbers. These same categories are listed on the following page.

First Page:

Sch #	School District USD Number
NS Less H/E	Non-Salary Related Data less Heat & Electricity

120	Non-Certified Salaries	520	Insurance
210	Insurance (Employee)	590	Other (Purchased
220	Social Security	610	General Supplies
290	Other (Employee Benefits)	621	Heating
300	Professional Tech Services	622	Electricity
411	Water/Sewer	626	Motor-Fuel-Not-Sch Bus
420	Cleaning	629	Other (Energy)
430	Repairs & Maintenance	680	Miscellaneous Supplies
440	Rentals	700	Property (Equipmt & Furniture)
460	Repair of Building	800	Other (Property Service)
490	Other (Purchased Property Services)		

Second Page:

93-94 FTEE	1993-94 Full Time Equivalent Enrollment
#Stu AC	Number of Student per Attendance Center
5 YR AV	5 Year Average Assessed Valuation per Pupil
5 YR Exp/Pup	5 Year Average Total Expenditures and Transfers per Pupil
93-94 EX/PU	1993-94 Total Expenditures and Transfers per Pupil
AREA SQMI	Land Area in square miles of a school district

Appendix I

SCH #	NS LESS W/E	120	210	220	290	300	411	420	430	440	460	490	520	590	610	621	622	626	629	680	700	800	TOTAL O&M
451	710	159	1	12	3	3	6	8	31	338	125	1	32	77	36	27	44	3	0	11	28	11	957
341	664	151	10	12	4	7	8	7	26	515	14	0	14	0	52	32	79	0	0	0	21	0	951
342	646	172	2	10	6	0	10	18	11	3	347	18	16	5	64	47	74	0	0	0	153	0	958
425	596	217	2	16	2	0	11	9	81	17	157	0	50	0	81	50	147	5	0	1	180	4	1,030
406	581	164	1	12	1	6	7	0	44	0	87	0	0	0	81	42	53	1	1	0	13	341	853
291	551	294	19	25	10	0	9	0	111	0	73	11	69	0	60	116	98	0	0	0	200	0	1,093
317	529	184	0	0	0	138	10	0	0	0	0	0	109	0	124	64	88	0	0	0	148	0	865
287	523	148	9	11	4	5	6	3	13	206	73	5	37	0	62	43	63	0	0	0	82	32	801
376	521	204	9	14	0	0	7	0	90	0	51	0	41	3	48	57	72	0	18	8	254	0	877
213	514	208	0	0	0	22	14	0	0	0	54	0	91	0	46	195	106	0	44	0	197	45	1,103
398	507	238	0	17	9	2	19	10	123	0	129	0	34	5	56	93	89	0	0	0	128	0	953
454	499	227	1	14	2	225	20	0	96	14	19	0	49	0	49	51	67	0	0	0	27	1	862
247	493	259	0	14	8	5	11	8	60	269	14	43	2	0	47	45	71	6	0	4	25	0	890
396	488	223	5	17	9	0	16	6	21	0	162	54	25	16	13	39	91	1	0	0	147	25	871
442	480	171	8	12	1	0	5	4	305	0	13	4	29	0	65	51	65	2	0	17	22	14	788
390	479	226	0	17	8	0	14	0	25	15	280	0	0	0	58	56	93	0	0	9	59	11	880
456	478	204	0	16	4	0	26	10	59	1	58	0	37	0	0	66	89	0	24	27	230	8	857
401	454	315	15	24	8	50	18	8	76	0	107	1	91	2	57	203	82	6	0	0	37	1	1,100
279	448	291	5	24	9	0	17	0	145	0	96	32	72	0	32	112	128	5	17	19	7	7	1,016
314	446	230	22	18	6	0	24	13	132	3	28	7	67	57	105	103	151	2	1	0	7	2	975
103	441	302	0	17	0	60	21	1	64	0	53	52	0	30	38	154	100	3	1	6	101	10	1,015
502	433	236	8	19	8	0	6	0	66	6	176	19	61	0	45	41	44	3	4	0	46	0	789
286	432	182	1	11	1	11	6	9	8	3	214	2	33	0	14	48	112	0	1	2	112	15	796
344	428	177	17	13	2	0	4	0	69	0	103	16	34	0	55	26	99	0	0	0	146	0	760
334	426	222	5	16	1	0	19	21	113	6	54	2	34	0	104	137	78	3	0	0	66	4	835
477	421	237	12	18	6	0	8	2	68	0	24	158	92	3	43	55	101	0	0	0	21	0	850
410	415	268	19	16	5	0	15	4	26	0	202	1	46	0	64	61	101	1	0	0	22	33	885
288	408	129	14	10	5	11	9	0	29	0	16	5	15	0	21	37	78	1	4	0	298	0	681
293	397	188	2	13	1	34	0	0	101	0	46	0	61	0	0	56	85	0	49	63	38	5	742
346	392	219	0	14	0	26	15	0	0	0	201	10	0	0	26	63	107	0	0	0	113	0	734
431	389	190	0	14	0	4	22	0	48	0	30	91	31	0	42	47	104	0	0	0	51	68	744
269	386	315	8	25	3	0	19	3	145	0	4	0	125	12	57	158	93	2	0	0	7	12	987
239	382	152	0	11	4	0	7	3	185	4	76	0	18	0	66	45	40	1	0	0	22	0	633
219	382	249	40	21	7	0	17	0	32	0	121	86	45	0	31	103	89	0	0	0	50	0	891
354	379	323	26	25	1	0	12	5	17	0	8	8	129	5	49	89	88	1	0	17	121	7	931
360	376	329	17	26	1	53	6	0	43	3	53	0	78	0	37	50	73	0	12	0	79	12	873
479	374	218	8	16	14	0	23	9	1	1	126	56	32	3	53	15	98	1	1	5	53	10	742
282	373	211	6	16	0	30	13	2	31	5	259	6	0	0	21	29	151	0	0	0	1	5	786
102	373	223	0	16	8	0	7	2	86	0	92	28	31	0	34	60	97	0	0	0	86	6	776
217	369	408	0	16	5	0	44	31	35	3	0	0	140	2	79	127	231	9	0	0	10	15	1,157
429	360	170	2	12	4	0	12	7	53	24	33	76	13	0	48	66	88	0	0	10	70	14	702
242	359	231	1	18	1	0	23	2	69	0	76	1	45	5	98	126	136	10	11	0	17	3	872
424	357	462	43	32	6	0	25	7	33	0	24	25	13	0	83	123	156	0	10	18	40	78	1,179
246	355	183	0	10	2	0	5	0	20	4	8	17	0	0	54	48	142	0	0	0	248	0	741
491	348	155	0	12	0	0	8	3	84	31	4	9	27	0	21	39	81	0	0	0	149	11	654
433	347	195	1	20	3	0	5	28	100	18	0	34	13	0	32	43	85	68	2	6	41	0	694
377	345	198	31	16	10	0	8	19	92	7	137	0	29	22	26	39	85	2	0	0	4	0	723
333	343	183	14	12	1	14	9	5	164	43	14	23	0	0	28	49	80	2	1	1	35	5	681
322	343	201	22	15	7	14	15	10	0	33	137	23	26	16	36	59	56	0	5	10	0	19	703
422	340	178	26	14	5	0	15	15	39	0	98	0	53	0	70	91	62	3	0	0	48	0	715
289	338	203	0	15	7	0	14	7	22	14	199	1	19	1	27	37	108	0	0	1	33	0	710
384	337	160	3	12	4	54	10	6	29	0	116	6	0	17	58	80	63	1	1	0	40	0	659
330	334	286	6	27	13	0	22	8	41	31	70	0	66	0	73	63	200	0	0	0	21	0	929
307	332	174	7	13	6	0	15	0	95	0	62	5	20	25	73	44	66	2	0	0	35	0	644
452	324	312	46	19	1	7	30	0	48	0	0	14	55	0	144	66	171	0	7	0	2	17	939
486	322	271	6	20	10	39	11	0	17	1	108	9	31	0	80	35	110	0	5	3	12	6	775
300	321	272	19	20	0	1	20	6	75	0	27	14	44	0	58	100	152	0	3	0	69	4	884
493	318	348	6	26	1	6	7	1	27	0	93	3	30	0	82	10	58	0	0	16	40	12	767
399	312	378	3	27	15	2	14	15	56	0	0	24	80	7	78	164	114	0	3	31	0	5	1,014
443	308	198	9	15	2	0	12	0	58	0	75	1	19	17	48	33	81	0	0	0	73	6	644
237	305	260	4	21	2	0	3	0	89	0	26	0	76	1	43	78	132	0	27	21	19	1	803
271	304	202	3	15	7	3	13	10	118	0	3	0	34	5	70	64	72	1	0	0	46	0	667

SCH #	MS LESS H/E	93-94 FTEE	#STU AC	5 YR AV	5YR EXP/PUP	93-94 EX/PU	AREA SQMI
451	710	246	123	24,068	5,842	6,807	107
341	664	707	236	16,942	4,775	5,752	97
342	646	565	282	20,373	4,988	5,645	90
425	596	293	146	22,891	5,513	6,319	102
406	581	485	243	15,111	4,940	5,930	78
291	551	165	55	54,667	6,911	7,548	268
317	529	87	43	60,432	7,097	8,095	200
287	523	822	164	21,615	4,827	5,595	227
376	521	549	183	28,073	5,103	5,842	158
213	514	97	48	70,876	7,783	8,491	300
398	507	445	111	28,293	5,614	6,197	235
454	499	369	123	15,594	5,255	5,836	74
247	493	836	167	20,196	4,857	5,369	300
396	488	782	391	14,494	4,736	5,431	125
442	480	497	249	33,015	5,091	5,677	115
390	479	126	63	57,648	6,480	7,820	210
456	478	272	91	22,020	5,771	6,882	133
401	454	195	65	71,564	6,433	7,198	196
279	448	203	68	40,644	6,209	7,226	232
314	446	147	73	72,935	6,629	7,783	373
103	441	223	74	84,765	6,635	7,184	688
502	433	191	96	72,861	5,883	7,218	224
286	432	470	235	27,023	4,930	6,020	383
344	428	421	210	15,660	5,248	5,753	93
334	426	263	66	41,207	5,393	6,360	273
477	421	276	138	45,818	5,225	6,253	267
410	415	642	214	28,885	5,171	6,022	232
288	408	621	311	18,450	4,680	5,797	142
293	397	370	185	34,173	5,327	6,147	346
346	392	564	141	28,161	4,967	5,764	302
431	389	822	205	30,031	4,490	5,196	292
269	386	179	60	89,494	6,941	8,179	249
239	382	728	243	28,375	4,451	5,503	419
219	382	259	129	57,774	5,653	6,331	292
354	379	329	165	49,662	5,858	6,271	162
360	376	338	169	34,593	5,336	5,852	194
479	374	314	105	27,135	5,310	6,262	177
282	373	509	170	34,232	5,084	5,928	541
102	373	619	309	37,879	5,006	5,602	538
217	369	197	98	331,614	8,157	8,950	252
429	360	439	219	14,573	4,739	5,820	95
242	359	120	60	75,310	7,237	7,850	243
424	357	100	50	124,691	9,895	10,471	216
246	355	606	303	15,327	4,456	5,662	106
491	348	884	442	16,290	4,739	5,132	53
433	347	221	74	37,270	5,714	6,969	127
377	345	820	137	25,955	5,164	5,660	350
339	343	454	151	19,424	5,200	6,087	114
322	343	462	154	24,687	5,430	6,200	256
422	340	352	176	56,019	5,140	6,073	244
289	338	764	382	20,479	4,867	5,600	130
384	337	294	98	27,438	5,317	6,494	319
330	334	616	154	25,080	5,213	5,749	370
307	332	403	101	20,896	5,027	6,023	225
452	324	538	108	140,400	5,453	6,201	690
486	322	194	97	31,642	5,962	7,999	10
300	321	411	103	70,485	5,961	6,923	864
499	318	753	188	8,269	4,728	5,427	14
399	312	110	55	120,023	8,123	9,652	439
448	308	464	232	31,174	5,224	5,961	144
237	305	632	316	32,722	4,997	5,664	599
271	304	439	220	44,564	4,937	5,800	445

SCH #	NS LESS H/E	120	210	220	290	300	411	420	430	440	460	490	520	590	610	621	622	626	629	680	700	800	TOTAL O&M
380	304	164	12	12	4	0	8	3	41	76	53	29	0	0	72	59	62	1	0	6	12	2	617
249	302	163	1	9	22	1	14	0	32	0	135	33	2	0	45	56	59	1	9	1	28	1	611
212	300	317	15	26	6	29	14	7	6	0	56	6	68	0	86	129	96	9	0	0	5	16	889
278	298	335	0	24	3	2	12	0	43	0	6	5	89	1	114	133	189	0	26	0	0	1	983
421	294	178	2	14	3	8	7	25	82	0	36	2	0	0	37	35	66	0	1	0	97	1	592
481	294	180	0	11	5	0	17	3	78	0	0	7	101	1	66	69	47	2	1	0	8	10	606
323	292	213	4	16	4	14	16	6	52	3	58	0	17	0	35	39	86	4	0	34	52	0	654
498	291	192	0	12	4	0	8	9	64	11	77	0	37	0	78	69	101	0	0	0	8	0	669
311	290	254	31	18	7	0	14	4	76	0	104	0	0	0	88	80	136	3	0	0	0	0	795
393	289	159	1	12	1	4	9	0	72	0	85	44	0	10	37	50	108	0	0	14	12	1	619
359	289	222	6	13	8	19	5	0	40	34	57	4	0	6	51	55	135	0	0	0	65	6	727
324	289	310	8	24	8	0	10	11	24	14	105	0	10	17	60	88	72	11	0	0	10	16	798
508	288	249	17	19	5	13	2	3	2	0	158	7	1	1	31	19	110	0	6	9	40	15	707
224	287	244	27	19	5	0	10	0	67	0	31	20	44	0	71	74	91	0	0	1	43	0	747
327	285	227	7	17	8	12	16	4	40	64	52	0	16	0	40	59	113	2	0	0	26	12	715
301	281	563	23	32	0	21	19	11	45	0	39	33	30	0	75	223	118	8	0	0	0	1	1,239
298	280	248	1	15	4	23	0	40	38	7	37	6	58	1	34	85	84	2	2	1	22	9	717
255	280	241	20	19	1	0	18	0	13	0	0	41	86	18	82	86	191	0	0	0	21	0	839
260	277	444	28	40	4	0	20	1	101	7	7	0	21	0	95	204	132	4	0	0	22	0	1,129
283	276	160	3	10	2	0	8	0	86	0	71	7	44	7	32	62	84	0	6	10	4	1	596
473	276	175	12	14	16	1	7	10	48	0	87	2	10	4	57	48	55	3	0	0	47	1	535
225	275	353	2	24	1	0	22	0	58	23	0	0	41	0	53	141	147	0	4	24	48	2	942
338	275	198	1	13	0	0	6	0	27	0	147	0	0	0	58	42	58	1	9	1	24	1	589
496	275	291	18	20	0	0	12	8	196	0	1	0	13	0	28	124	83	0	12	2	0	2	811
467	273	305	4	22	8	0	11	2	69	19	33	0	31	1	107	80	132	0	0	0	0	0	826
371	272	286	12	21	0	0	27	0	78	0	73	10	0	0	48	84	123	9	0	0	26	0	798
275	272	402	8	32	13	3	14	16	1	18	15	1	75	0	79	127	128	0	5	41	2	0	982
336	269	177	0	13	3	0	4	0	25	0	95	59	28	0	0	53	73	3	9	10	0	35	588
356	264	186	4	14	0	0	22	0	54	93	3	25	19	0	32	61	95	1	0	2	6	7	624
348	264	235	0	16	1	2	10	0	43	6	33	0	49	0	74	38	73	0	2	0	44	0	627
397	262	172	1	13	5	8	5	6	82	0	24	3	37	3	42	62	86	4	3	15	28	1	601
426	260	181	3	10	0	29	6	0	30	0	130	9	0	0	25	53	96	2	7	1	9	13	603
266	259	77	0	6	3	1	0	65	10	0	149	1	0	0	24	21	94	0	0	0	7	0	458
392	258	191	8	14	5	0	10	6	58	0	33	26	24	0	68	86	85	1	0	1	10	23	648
347	258	219	0	3	0	1	24	7	8	9	15	8	59	4	99	72	59	14	6	1	2	0	611
484	257	201	23	9	4	0	15	2	77	13	78	2	0	9	25	34	90	0	0	0	35	1	619
482	257	260	0	20	0	57	9	4	47	0	30	4	0	0	48	70	218	2	0	18	19	20	825
209	257	336	35	23	9	0	13	24	28	12	6	0	92	0	65	50	207	3	0	11	0	3	917
511	256	241	0	18	5	55	13	0	39	0	11	0	0	0	76	39	85	0	0	0	63	0	644
488	256	189	0	14	6	0	8	9	41	49	17	0	38	1	60	76	90	9	0	3	19	0	631
243	256	172	13	14	5	0	13	5	17	0	102	7	40	0	35	53	41	1	0	0	36	0	554
361	255	259	6	18	6	0	13	14	16	0	58	45	24	0	39	42	146	4	0	0	43	0	712
404	255	265	22	44	0	15	18	13	27	0	77	2	0	0	16	14	120	0	0	0	85	2	720
227	254	207	1	15	4	0	9	3	2	0	0	6	30	7	98	129	82	0	2	7	89	0	692
476	249	478	12	37	15	3	10	12	15	6	3	3	83	4	78	204	168	3	0	10	10	10	1,162
210	249	315	14	22	7	0	17	2	57	0	40	9	32	1	68	51	145	0	0	6	18	0	803
302	247	345	13	26	10	1	12	0	0	0	0	0	0	0	61	121	175	0	13	116	43	0	938
411	247	223	0	12	0	0	5	0	60	0	0	0	59	0	47	71	93	0	4	0	49	23	646
436	246	176	22	13	2	0	9	5	3	13	17	0	0	0	55	23	123	1	4	5	111	23	605
439	245	225	12	17	8	1	11	3	20	24	72	1	1	0	75	70	118	2	0	0	28	6	696
235	243	135	9	10	1	2	7	6	86	0	1	20	42	0	44	30	116	2	0	0	34	1	545
299	242	185	0	14	0	26	24	0	48	0	31	0	69	0	18	106	115	2	0	9	0	14	662
229	239	210	18	16	4	35	5	0	55	0	10	12	32	20	25	12	130	3	37	1	0	0	630
316	239	277	3	20	1	21	2	0	0	0	0	53	55	33	49	101	75	0	14	0	12	0	714
349	235	311	19	24	7	21	7	5	30	0	11	8	49	0	75	84	49	0	0	0	26	3	729
294	235	198	25	14	4	3	14	12	55	1	48	9	39	0	34	47	84	1	0	0	19	0	608
350	234	251	30	16	4	48	8	0	39	0	0	16	63	11	24	61	83	0	4	10	12	0	678
366	233	180	11	14	4	25	10	7	27	0	6	95	27	0	35	34	71	0	0	0	0	0	547
351	232	214	5	16	3	9	17	6	8	0	53	3	40	0	56	81	96	0	0	2	31	8	646
329	231	151	0	9	3	0	9	7	7	4	14	0	30	11	63	48	57	0	0	0	85	0	499
432	231	221	0	17	7	1	7	4	67	1	23	30	0	0	27	66	56	2	1	1	63	4	598
463	230	154	22	14	6	0	12	0	135	0	0	0	0	17	50	49	90	0	6	0	8	3	565

SCH ♦	NS LESS H/E	93-94 FTEE	♦STU AC	5 YR AV	5YR EXP/PUP	93-94 EX/PU	AREA SQMI
380	304	646	161	27,234	4,895	5,636	402
249	302	522	261	18,066	4,741	5,511	22
212	300	205	68	35,321	6,330	7,174	263
278	298	303	101	24,933	5,659	6,090	222
421	294	464	232	20,725	5,152	5,763	109
481	294	395	99	31,838	5,431	5,973	304
323	292	699	233	16,412	4,817	5,618	233
498	291	465	155	23,022	4,973	5,985	205
311	290	307	102	36,424	5,730	6,467	208
393	289	375	187	30,750	5,640	5,893	188
359	289	243	122	40,746	5,738	6,702	174
324	289	172	86	36,581	6,016	7,566	261
508	288	908	227	14,823	4,576	5,021	26
224	287	392	98	39,185	5,447	6,420	255
327	285	869	217	24,395	5,012	5,460	425
301	281	80	40	121,340	9,082	10,102	233
298	280	405	203	37,318	5,274	6,024	444
255	280	357	119	62,490	5,459	5,991	426
280	277	119	59	74,623	8,138	8,424	270
283	276	206	103	24,250	5,540	7,186	160
473	276	1,313	188	27,574	4,301	4,891	574
225	275	154	77	71,170	7,141	9,046	281
338	275	483	242	15,483	4,587	5,620	115
496	275	169	84	67,987	7,356	7,604	283
467	273	608	122	44,559	5,143	5,912	776
371	272	182	91	56,587	6,697	7,813	201
275	272	111	55	93,130	7,316	8,587	662
336	269	1,001	250	17,425	4,525	5,020	166
356	264	485	162	25,054	5,316	5,986	158
348	264	1,127	225	20,339	4,522	4,908	139
397	262	288	144	41,417	5,560	6,605	400
426	260	281	94	36,329	5,484	6,367	195
266	259	3,542	886	16,390	4,003	4,497	43
392	258	484	161	28,840	5,154	5,893	511
347	258	422	105	40,780	5,645	6,213	340
484	257	927	309	25,725	4,877	5,608	402
482	257	405	135	48,367	5,102	5,774	578
209	257	181	90	449,125	9,251	9,049	223
511	256	182	91	49,742	5,987	7,184	126
488	256	366	73	30,760	5,420	6,053	225
243	256	579	145	24,481	4,698	5,575	248
361	255	1,053	351	35,367	4,503	5,154	598
404	255	744	372	22,807	4,766	5,558	60
227	254	295	147	57,184	5,733	6,119	559
476	249	112	56	88,565	9,006	9,330	200
210	249	977	326	234,475	5,257	5,608	575
302	247	194	65	67,856	6,127	7,373	318
411	247	284	142	24,962	5,346	6,253	111
436	246	804	402	19,140	4,830	5,250	168
439	245	390	195	17,065	5,497	6,319	42
235	243	459	229	21,949	4,903	5,933	309
299	242	195	98	42,873	5,477	7,447	320
229	239	11,570	551	57,861	4,581	4,997	87
316	239	152	51	56,931	6,534	7,725	242
349	235	317	158	51,580	6,117	6,035	242
294	235	613	307	37,005	4,637	5,746	724
350	234	473	158	54,499	5,361	5,932	308
366	233	632	316	32,469	4,297	5,626	422
351	232	279	139	99,524	5,787	6,481	360
329	231	585	117	29,020	4,848	5,708	397
432	231	369	185	35,997	4,881	5,986	193
463	230	430	215	19,639	5,066	6,059	140

SCH #	NS LESS H/E	120	210	220	290	300	411	420	430	440	460	490	520	590	610	621	622	626	629	680	700	800	TOTAL O&M
444	228	228	5	17	8	2	19	12	38	2	29	5	39	1	59	86	65	1	0	0	22	0	638
321	227	275	11	22	3	11	8	9	7	2	12	7	93	12	35	42	173	2	1	7	4	16	754
387	227	168	3	14	1	0	18	0	27	0	46	3	0	28	41	60	80	1	0	1	44	18	574
272	226	256	0	17	6	0	10	0	24	0	111	10	25	1	31	78	86	0	1	1	5	7	649
226	226	278	25	21	6	0	25	6	60	0	26	47	40	0	20	103	139	0	0	0	1	1	800
200	225	260	6	15	0	17	45	0	0	0	0	0	35	1	76	71	162	0	0	0	55	0	740
292	225	330	0	18	3	7	3	0	29	0	0	0	30	0	102	112	151	0	0	0	27	26	838
369	223	285	4	22	12	1	19	5	76	1	17	12	0	0	55	61	99	2	1	7	21	6	705
245	222	204	9	16	0	9	25	18	38	3	4	0	47	11	37	70	92	0	0	0	0	35	613
440	222	210	11	16	8	1	6	0	0	0	0	0	42	7	22	36	169	0	0	0	144	0	671
318	222	222	17	14	5	0	10	33	65	0	11	0	18	0	0	64	87	0	44	0	42	0	629
223	222	194	1	13	4	1	7	3	87	0	21	28	20	0	29	68	75	0	0	0	25	0	578
471	222	308	0	17	0	8	8	0	0	0	0	0	16	0	95	27	177	0	10	0	41	44	751
208	221	148	10	2	4	4	7	0	32	0	65	10	0	5	26	75	54	0	0	0	45	28	514
355	221	200	0	14	0	0	10	0	65	0	0	0	63	0	48	67	102	11	3	0	17	3	604
256	221	168	1	13	17	0	20	0	103	0	0	0	24	0	35	62	64	5	0	0	12	21	546
505	220	208	2	15	10	0	8	1	57	0	39	6	13	0	42	50	56	1	3	11	23	15	561
509	219	163	0	13	7	85	16	0	52	0	0	0	29	0	38	59	42	0	0	0	0	0	502
221	217	247	0	19	4	1	30	9	84	0	0	2	34	6	44	106	83	0	0	7	0	0	676
483	217	243	20	56	1	0	5	2	10	41	0	102	37	19	0	114	137	0	0	0	0	0	787
420	216	239	2	17	0	0	8	11	31	0	17	0	0	0	30	40	75	2	0	0	117	0	589
251	214	180	7	15	1	8	15	11	43	1	4	0	34	0	58	67	59	0	5	2	20	12	543
382	213	220	6	16	2	5	14	0	10	0	5	38	19	0	13	28	63	2	0	0	106	0	548
395	213	233	17	13	6	0	9	4	3	0	17	0	44	0	40	108	73	2	9	8	54	24	664
474	212	270	4	20	0	17	11	0	93	0	47	0	0	0	40	81	91	2	1	0	0	0	680
464	210	193	3	11	7	1	8	12	40	23	49	26	29	1	14	39	70	0	1	0	6	0	535
458	209	201	11	15	4	0	10	3	38	0	57	9	38	0	29	44	60	4	19	1	1	0	545
394	208	220	0	16	3	1	11	0	27	60	65	2	11	0	24	26	94	1	0	0	4	1	567
304	207	282	1	24	35	4	20	0	12	0	0	7	3	1	108	113	112	0	20	3	2	28	771
252	207	282	12	21	7	0	10	0	40	0	27	0	36	36	27	48	66	6	5	4	10	6	644
381	206	238	10	17	3	0	22	5	0	0	0	6	31	18	45	58	58	0	4	21	55	0	591
281	205	255	0	3	0	25	24	0	0	0	24	2	52	13	42	80	98	0	7	0	0	17	642
335	203	183	11	14	9	9	2	16	61	0	15	9	19	3	37	52	189	1	17	8	6	1	661
423	202	212	70	63	12	17	8	3	37	0	24	10	48	0	29	64	121	0	9	0	0	17	746
455	202	247	4	15	1	0	19	6	51	0	48	7	2	0	69	90	109	0	0	0	0	0	667
312	202	191	4	14	6	1	3	7	17	0	42	5	26	5	43	56	91	2	4	8	37	2	563
362	202	276	0	16	0	6	9	4	73	2	13	29	0	2	59	20	168	0	4	0	0	0	682
228	200	217	1	16	0	14	6	11	37	0	2	0	38	1	73	76	114	1	0	0	9	7	624
372	199	214	0	16	1	0	12	12	49	1	0	2	16	2	48	42	75	0	0	0	55	2	547
244	199	277	1	20	3	92	15	0	27	0	0	6	20	0	39	37	336	0	0	0	0	0	872
222	199	217	0	0	2	0	3	1	101	4	0	1	40	0	43	59	99	5	2	0	0	0	576
343	199	220	0	17	2	4	8	17	54	0	8	24	33	11	20	53	81	1	7	0	8	2	572
405	199	261	26	21	7	7	8	6	59	2	11	14	31	1	25	60	72	2	0	2	31	0	666
434	199	160	11	12	5	1	12	15	52	0	24	1	25	1	57	32	57	1	0	0	6	3	476
409	197	258	15	19	13	6	6	1	2	0	89	4	25	0	15	44	93	2	2	1	18	25	639
328	196	296	4	18	6	0	12	15	57	0	5	4	19	0	62	82	95	1	2	0	16	2	697
309	194	191	21	15	0	74	11	4	27	3	0	0	1	17	4	37	53	0	0	35	10	10	511
487	193	163	12	19	0	0	4	3	42	0	32	9	30	0	62	55	73	0	0	9	0	2	516
408	193	183	0	14	2	14	11	0	21	12	28	2	22	0	30	48	62	0	1	0	50	2	502
206	190	312	1	5	0	44	22	0	27	0	5	3	52	0	20	78	144	0	6	0	6	5	729
495	190	273	3	3	0	0	12	0	81	14	0	0	50	12	13	72	63	0	0	0	8	0	605
368	189	197	11	15	0	9	11	0	38	1	41	15	43	7	23	19	144	0	0	0	0	0	576
[redacted]	[redacted]	[redacted]	14	3	4	0	15	60	0	0	0	37	0	18	[redacted]	0	17	21	[redacted]	0	[redacted]	[redacted]	[redacted]
295	187	286	3	23	7	42	7	0	46	0	0	1	0	0	72	141	113	0	0	0	10	9	759
326	185	369	0	29	14	0	13	2	58	0	0	56	0	0	56	118	145	1	0	0	0	0	861
386	185	267	7	17	2	4	26	1	49	0	32	14	0	8	45	51	159	1	0	0	3	1	688
308	185	294	3	21	16	1	6	4	31	4	23	23	14	22	56	76	70	0	0	0	0	0	664
215	184	241	46	19	6	86	6	4	25	0	0	3	6	0	48	62	175	0	0	0	6	0	734
462	184	252	7	15	0	1	20	0	14	0	30	4	27	0	48	47	95	0	8	0	7	26	600
438	183	175	11	14	6	4	0	4	63	0	18	0	0	1	63	25	129	0	0	1	24	6	543
238	182	214	0	15	0	0	7	0	40	0	19	0	7	0	52	53	104	0	4	0	46	9	569
352	182	256	10	20	6	2	12	3	37	0	16	13	21	5	39	66	80	0	7	3	25	1	619

SCH #	NS LESS H/E	93-94 FTEE	#STU AC	5 YR AV	5YR EXP/PUP	93-94 EX/PU	AREA SQMI
444	228	280	93	62,978	5,682	6,834	245
321	227	1,029	172	221,050	5,298	5,763	311
387	227	375	94	25,234	5,328	6,335	192
272	226	581	97	26,307	4,945	5,636	411
226	226	428	214	95,219	5,402	5,877	440
200	225	353	176	75,658	5,199	6,081	780
292	225	167	84	55,683	6,862	7,984	437
369	223	292	146	32,968	5,557	6,190	95
245	222	351	88	41,208	5,157	5,891	207
440	222	739	246	25,251	5,064	5,872	130
318	222	478	159	33,209	5,264	5,837	540
223	222	371	186	45,526	5,643	6,551	378
471	222	182	91	35,747	6,151	7,271	213
208	221	677	339	37,856	4,840	5,520	678
355	221	577	192	35,866	5,273	5,828	154
256	221	375	125	32,241	4,947	6,171	225
505	220	285	143	16,898	5,557	6,301	49
509	219	238	119	31,373	5,079	6,662	150
221	217	165	55	48,127	6,512	8,380	232
483	217	614	205	66,458	4,804	5,824	541
420	216	627	313	21,769	4,750	5,443	127
251	214	733	183	25,669	4,641	5,528	454
382	213	1,350	338	30,071	3,822	4,517	267
395	213	357	89	65,661	5,899	6,476	486
474	212	198	94	79,362	7,148	7,489	235
464	210	1,518	506	18,444	4,198	4,558	142
458	209	1,506	377	20,170	4,125	4,352	90
394	208	1,589	530	15,572	4,154	4,295	55
304	207	136	68	70,210	7,289	7,706	251
252	207	599	150	25,790	4,828	5,773	295
381	206	306	153	30,600	5,185	5,849	182
281	205	536	134	40,727	5,339	5,760	459
335	203	412	206	20,237	5,320	6,148	213
423	202	469	156	37,991	5,334	6,178	156
455	202	152	76	43,558	6,979	7,964	205
312	202	1,166	194	29,275	4,290	5,052	282
362	202	887	177	136,041	5,189	5,700	320
228	200	151	76	62,254	7,046	7,659	249
372	199	660	330	17,636	4,806	5,336	94
244	199	975	325	567,165	4,970	5,266	147
222	199	396	198	23,917	5,309	5,844	157
343	199	996	166	21,991	4,607	5,095	153
405	199	881	176	25,379	4,729	5,065	116
434	199	1,292	258	15,067	4,286	4,676	201
409	197	1,683	240	21,666	3,756	4,182	53
328	196	559	80	79,841	6,034	6,499	421
309	194	1,422	284	25,712	4,131	4,709	188
487	193	561	187	17,269	4,613	5,592	94
408	193	645	215	25,306	4,898	5,574	237
206	190	550	183	37,366	5,453	6,082	253
495	190	1,176	147	32,804	4,537	4,972	518
368	189	1,776	355	23,421	3,972	4,369	200
306	187			50,746	5,029	5,799	218
295	187	97	48	52,265	7,195	8,371	244
326	185	221	111	57,337	6,026	6,937	332
386	185	296	148	35,350	5,891	6,247	253
308	185	5,156	368	26,313	3,633	4,086	14
215	184	734	245	201,185	5,659	6,007	645
462	184	366	122	29,160	5,123	6,281	309
438	183	371	186	57,162	5,518	6,209	490
236	182	192	96	34,037	6,151	7,411	230
352	182	1,195	239	35,824	4,572	5,380	914

SCH #	NS LESS H/E	120	210	220	290	300	411	420	430	440	460	490	520	590	610	621	622	626	629	680	700	800	TOTAL O&M
447	180	188	20	15	0	0	11	1	42	0	39	0	0	0	43	36	146	0	3	1	16	22	585
357	179	235	0	15	0	0	8	0	13	13	30	0	0	22	64	36	104	0	2	1	20	7	570
504	179	158	4	8	5	2	12	3	21	4	4	40	1	17	59	45	46	1	0	0	9	5	443
492	178	324	0	0	0	0	19	0	4	0	0	0	96	0	39	181	58	0	13	6	0	2	741
506	177	179	0	13	4	50	14	0	0	0	0	0	21	4	75	43	49	0	0	0	13	1	466
403	177	289	2	22	11	0	9	3	83	0	18	1	0	0	38	82	60	1	0	4	19	1	644
274	177	379	1	27	2	0	15	1	18	0	0	0	0	25	102	85	69	0	0	6	9	2	741
358	177	177	0	12	0	24	9	0	22	0	34	11	23	21	21	58	120	1	2	0	10	0	544
364	176	269	1	20	4	32	9	0	27	0	46	0	27	0	25	37	58	0	0	0	5	5	565
320	176	194	8	12	7	0	1	3	15	0	41	0	5	0	90	29	97	0	3	12	6	0	524
460	176	252	26	15	1	8	9	4	29	2	18	2	1	1	80	29	155	0	5	0	8	8	654
363	176	452	44	35	7	18	11	3	52	0	0	2	0	13	60	57	244	0	8	0	0	6	1,014
254	176	224	14	18	11	21	14	1	36	7	24	2	31	0	36	55	71	0	0	0	0	2	569
332	175	215	1	16	1	6	18	11	10	0	16	2	0	17	64	72	97	0	0	3	28	1	578
218	174	293	0	24	22	4	32	1	29	0	0	11	23	1	61	99	101	1	1	5	1	4	712
368	174	269	0	19	1	0	18	7	18	0	0	5	55	2	67	84	187	0	0	0	0	0	734
331	173	185	28	14	8	0	9	5	44	0	82	0	16	0	16	24	119	0	0	0	0	1	550
[redacted]	[redacted]	[redacted]	10	6	0	13	4	19	0	0	2	22	23	33	[redacted]	[redacted]	[redacted]	0	[redacted]	0	[redacted]	[redacted]	[redacted]
400	171	170	19	13	0	0	8	4	67	0	0	0	13	1	18	41	62	3	0	38	18	0	476
417	171	166	3	12	7	6	5	6	12	5	28	2	25	0	27	51	52	1	46	5	2	1	461
378	167	189	0	14	7	0	3	23	49	8	35	0	2	1	32	44	56	0	2	0	0	12	478
241	166	211	21	16	3	0	17	7	28	0	7	0	32	16	43	90	83	0	0	0	1	15	591
412	166	240	0	0	0	3	10	0	35	43	18	4	0	0	23	70	89	0	0	0	15	16	565
337	165	237	3	18	7	0	20	8	43	5	23	10	18	3	31	15	92	0	0	1	2	1	538
220	164	263	28	20	15	0	19	0	41	0	23	2	0	4	68	48	83	1	2	4	0	0	619
507	164	260	33	21	9	21	10	3	42	0	1	0	41	7	31	77	203	0	4	3	0	1	787
216	163	251	57	21	3	5	27	0	10	0	2	3	44	0	47	61	195	0	0	12	9	3	751
490	162	172	2	10	6	38	14	2	11	0	6	9	19	2	39	45	89	1	0	0	7	13	486
449	162	197	7	14	3	4	6	18	20	5	16	0	35	2	28	36	82	0	2	17	7	0	501
231	161	236	18	18	9	0	9	9	52	0	0	0	19	20	23	44	110	0	0	5	20	2	536
468	161	250	1	15	1	0	9	0	0	0	0	61	0	0	83	119	149	4	0	0	2	2	696
475	161	197	18	15	5	0	12	2	50	0	15	4	13	10	51	25	55	0	0	0	5	0	476
310	161	279	0	19	3	2	9	0	14	0	0	2	0	0	74	104	143	0	2	0	32	26	709
416	160	253	23	19	1	0	9	10	34	2	46	0	0	0	33	27	139	3	5	0	19	0	622
258	158	149	7	12	12	2	9	0	21	0	34	0	0	0	42	39	87	1	3	46	0	0	485
494	157	265	6	21	43	31	36	0	0	0	8	0	0	8	74	53	116	0	0	0	0	0	662
204	154	284	1	22	11	16	11	0	21	0	11	2	26	9	19	44	69	0	4	0	29	7	586
203	154	225	1	17	8	9	14	1	31	0	1	10	31	2	20	34	69	1	0	2	5	27	508
260	154	221	5	17	2	3	8	0	60	5	7	1	17	20	20	26	89	3	0	7	0	4	514
211	153	244	10	19	7	0	5	7	20	0	22	0	21	1	55	60	89	1	0	1	20	0	583
273	153	246	10	14	3	1	8	0	40	0	19	4	13	5	26	50	94	1	3	1	31	0	571
489	153	148	25	11	1	0	0	5	28	34	34	0	9	5	26	28	74	0	7	0	3	1	440
253	153	192	8	15	8	5	6	3	11	6	45	0	17	1	51	29	50	1	0	1	7	0	454
303	152	286	4	21	6	8	18	6	22	0	37	1	1	0	48	83	119	2	0	0	2	7	672
415	152	177	32	13	7	1	7	3	18	24	2	12	28	2	49	46	68	2	0	1	3	0	494
374	151	220	23	16	0	25	7	0	10	0	15	3	12	0	45	59	86	0	14	2	16	3	556
379	150	156	5	12	2	0	10	12	15	0	15	0	24	8	36	32	46	0	0	0	30	0	403
459	149	169	27	12	3	0	8	0	63	2	10	1	0	0	41	54	60	1	0	0	23	0	473
270	149	311	11	23	11	0	13	10	29	0	2	9	38	0	41	61	97	2	0	0	5	0	663
340	148	254	3	11	0	3	9	0	41	3	0	8	0	28	36	27	85	1	7	1	11	0	528
285	148	227	5	14	0	53	8	0	0	0	0	0	0	0	62	64	177	2	7	6	4	5	635
205	147	210	2	13	0	0	8	12	25	16	26	0	2	9	47	34	113	0	0	0	0	1	519
461	146	183	15	14	7	0	9	4	37	0	38	3	30	0	22	30	120	1	0	0	2	1	516
230	146	188	10	11	6	1	15	7	40	8	0	0	38	1	27	45	64	2	6	0	2	1	469
419	145	275	3	19	1	0	7	0	45	0	0	20	0	5	27	79	73	1	0	0	0	40	595
257	145	206	0	15	3	2	7	2	16	43	6	15	1	3	27	42	42	1	2	5	13	2	452
297	145	164	11	13	5	0	7	1	0	0	34	0	43	0	39	60	55	0	2	0	19	0	452
267	143	181	0	12	0	0	10	4	11	0	8	0	47	13	30	47	90	0	8	0	10	0	473
450	141	179	6	28	13	0	5	2	82	3	0	7	22	0	18	6	79	1	0	0	1	0	452
325	140	273	4	16	0	0	20	3	47	0	19	4	0	1	34	45	92	0	0	0	9	2	569
375	140	188	1	11	0	19	19	0	28	0	15	10	5	0	1	39	102	0	6	28	7	1	481
365	139	184	0	14	4	3	13	4	14	2	5	3	23	5	50	51	70	3	5	3	9	0	463

SCH #	NS LESS H/E	93-94 FTEE	#STU AC	5 YR AV	5YR EXP/PUP	93-94 EX/PU	AREA SQMI
447	180	644	161	15,344	4,918	5,458	92
357	179	774	258	14,927	4,668	5,264	84
504	179	468	117	21,662	5,115	5,630	45
492	178	256	85	46,144	6,042	6,569	389
506	177	1,684	277	16,701	3,853	4,443	500
403	177	357	71	43,439	5,476	6,244	340
274	177	504	126	48,707	5,420	6,258	637
358	177	456	233	23,035	4,481	5,704	136
364	176	1,026	256	28,353	4,384	5,149	325
320	176	1,387	347	18,375	4,034	4,554	193
460	176	791	264	26,975	4,956	5,454	60
363	176	728	364	162,801	5,341	5,734	231
254	176	759	190	47,214	4,561	5,350	718
332	175	317	106	89,624	6,146	6,142	324
218	174	530	177	84,110	5,400	6,267	376
388	174	375	188	44,230	5,351	5,846	281
331	173	1,227	307	44,832	4,491	4,764	566
264	172			28,576	4,235	4,978	136
400	171	933	311	31,930	4,713	5,164	396
417	171	1,078	216	27,473	4,292	4,991	537
378	167	646	323	17,884	4,683	5,706	160
241	166	299	100	48,401	5,178	6,169	682
412	166	493	246	41,905	5,041	5,821	575
357	165	823	274	13,515	4,778	5,477	169
220	164	257	86	90,526	5,696	6,497	660
507	164	372	186	258,749	6,382	6,352	250
216	163	338	113	167,862	5,473	6,003	216
490	162	2,306	288	24,759	3,417	3,832	128
449	162	610	152	22,277	4,719	5,662	117
231	161	1,804	451	29,928	4,023	4,353	103
468	161	117	59	76,749	7,255	8,039	203
475	161	6,760	376	11,826	3,450	3,767	262
310	161	478	119	50,977	5,632	6,291	436
416	160	1,140	285	23,672	4,410	5,074	156
258	158	619	206	24,624	4,666	5,514	126
494	157	399	199	102,879	5,327	5,884	992
204	154	2,013	288	23,701	3,962	4,686	38
203	154	1,213	404	29,218	4,595	4,995	31
260	154	6,198	563	22,154	3,660	3,876	50
211	153	752	251	20,529	4,835	5,386	337
273	153	817	409	30,303	4,838	5,595	433
489	153	3,455	288	30,322	3,761	4,452	380
253	153	4,622	462	19,722	3,427	3,886	135
303	152	358	179	56,006	5,460	6,083	443
415	152	1,228	409	25,906	4,355	4,854	331
374	151	517	172	100,855	5,287	5,775	356
379	150	1,700	189	22,036	3,620	4,248	633
459	149	384	192	40,411	4,462	5,963	358
270	149	486	243	52,581	5,338	5,778	276
340	148	846	282	18,076	4,810	5,290	68
285	148	174	87	41,623	5,185	7,219	259
205	147	824	206	22,822	4,267	5,428	349
461	146	760	253	18,398	4,769	5,265	119
230	146	1,246	311	19,589	4,377	4,895	71
419	145	477	119	33,262	5,058	5,746	168
257	145	1,834	262	15,285	3,561	3,904	141
297	145	435	218	40,865	5,033	5,903	640
267	143	1,469	210	26,497	4,243	4,638	210
450	141	3,381	483	22,931	3,473	4,153	140
325	140	729	243	30,909	5,001	5,558	353
375	140	1,385	346	39,720	4,251	4,522	175
365	139	1,083	180	30,040	4,348	4,969	430

SCH #	NS LESS H/E	120	210	220	290	300	411	420	430	440	460	490	520	590	610	621	622	626	629	680	700	800	TOTAL O&M
262	139	153	8	7	5	1	8	10	32	1	4	0	20	6	27	32	112	0	0	0	29	2	455
265	138	212	10	17	0	7	6	15	26	0	5	3	0	0	46	29	105	0	17	1	9	2	511
418	135	256	13	18	2	1	5	8	40	2	0	0	11	8	52	20	41	2	0	0	5	0	485
104	134	233	75	345	45	0	14	0	0	0	0	31	0	38	51	123	114	0	0	0	0	0	1,069
233	134	204	13	16	5	9	13	1	26	16	0	0	0	6	28	23	109	2	7	1	26	0	505
441	133	188	6	11	0	0	11	2	15	54	5	3	0	0	32	51	76	0	1	0	6	3	464
465	133	191	14	13	5	22	5	0	20	9	14	3	31	0	22	25	66	0	6	0	0	1	445
313	132	217	17	16	0	5	7	6	32	0	0	0	13	13	55	20	112	0	0	0	0	1	514
443	131	202	0	14	8	0	10	1	22	12	34	6	14	2	19	32	54	1	2	0	8	0	441
202	131	266	12	16	0	2	10	3	14	18	6	1	25	0	13	40	50	2	2	23	4	8	518
101	131	199	7	14	5	0	14	3	12	0	7	0	31	1	38	41	41	0	0	0	24	0	437
427	131	275	6	15	0	0	7	4	3	3	0	0	26	8	42	51	59	0	0	0	38	0	538
345	129	204	10	16	7	2	7	3	27	22	9	5	1	1	42	34	72	2	0	2	7	0	472
493	129	233	0	0	0	0	9	0	10	0	7	17	1	1	72	40	81	0	0	0	10	1	483
333	127	208	32	17	9	0	11	7	26	0	0	1	16	0	61	42	62	0	0	0	4	2	497
284	123	236	3	17	2	0	11	3	0	0	0	24	53	0	19	71	76	2	4	7	0	0	529
214	122	246	13	19	0	7	19	0	10	0	23	5	0	1	26	35	121	2	5	23	1	0	557
430	122	179	16	13	6	2	6	1	26	1	20	7	23	2	34	55	87	0	0	0	0	0	480
240	121	177	2	13	4	0	7	0	41	0	16	0	0	0	48	42	45	0	5	0	2	0	404
453	119	195	13	15	5	0	7	6	13	2	23	5	21	2	27	29	53	0	0	6	6	1	431
315	119	164	7	12	6	1	7	16	16	3	0	0	32	1	34	45	46	0	0	0	10	0	399
383	117	179	3	13	1	1	5	5	48	1	0	0	16	10	26	25	56	0	3	0	2	0	394
470	116	240	9	18	9	0	9	7	31	0	0	0	23	14	28	26	81	1	2	0	0	0	499
367	114	228	12	17	12	22	10	1	44	0	0	0	0	0	28	53	71	0	0	0	6	2	506
497	112	189	4	14	5	4	12	4	28	14	0	0	13	10	26	29	48	0	0	0	0	0	402
402	108	128	7	10	7	1	12	5	4	8	0	0	5	9	18	37	52	0	0	0	25	21	349
466	105	221	9	16	1	0	9	5	12	0	13	5	24	1	27	51	104	2	5	0	0	3	506
469	103	209	0	15	0	0	8	4	9	0	15	1	15	9	39	20	65	0	0	0	4	0	414
413	103	186	0	11	6	0	6	0	0	0	0	0	22	9	14	31	77	0	0	0	12	39	413
353	101	205	2	15	2	10	7	5	25	0	4	5	13	0	22	27	73	2	0	0	7	0	424
248	98	184	5	14	7	13	12	4	3	0	0	35	0	7	3	18	43	0	11	0	10	0	367
305	95	241	16	18	2	0	9	0	27	8	0	0	9	12	19	38	39	5	0	0	6	0	450
268	94	181	3	14	3	0	16	8	31	0	6	0	0	0	32	31	93	1	0	0	0	0	419
234	92	163	24	5	0	2	7	2	18	1	0	11	14	4	11	17	90	6	12	1	0	2	390
445	92	167	17	13	4	0	9	9	9	0	11	0	29	1	21	45	55	1	0	0	1	0	393
501	90	247	20	19	6	0	10	3	12	7	0	1	19	0	36	36	45	2	0	1	0	0	465
259	89	313	38	25	11	0	11	1	24	18	2	0	7	3	12	29	95	3	0	0	7	0	599
261	89	211	1	17	8	1	4	1	6	0	30	1	0	1	38	23	81	2	0	1	3	0	430
389	88	277	6	22	9	2	14	0	0	0	0	0	27	4	21	55	91	0	12	0	2	5	548
437	88	146	6	12	5	0	11	0	28	0	0	0	0	11	13	36	107	2	0	8	12	1	401
232	86	161	12	12	3	11	13	0	6	6	0	0	0	6	38	36	57	1	1	0	1	2	368
500	85	401	18	36	11	4	12	0	0	0	0	3	0	3	10	36	71	2	5	2	3	42	657
373	82	262	11	20	7	0	13	0	0	1	0	0	1	12	36	42	89	1	0	0	5	0	513
385	80	167	8	8	0	1	8	0	22	0	12	11	0	4	19	24	97	0	0	0	3	0	385
435	79	192	0	14	9	0	5	3	6	0	19	3	10	5	28	37	61	0	0	0	0	0	392
457	79	240	0	14	18	5	0	1	25	3	0	4	13	17	12	26	64	0	1	0	0	0	442
290	79	165	6	12	1	0	12	1	10	2	9	1	8	7	13	44	49	4	0	0	11	0	356
250	78	197	5	15	4	0	9	4	13	0	9	3	8	2	19	31	120	0	5	1	0	4	450
503	77	196	2	14	0	12	7	0	22	0	0	1	8	0	16	34	37	0	0	7	5	0	360
480	76	203	0	13	0	2	15	0	4	0	2	2	21	14	15	28	85	0	0	0	1	0	406
446	70	176	11	14	1	0	8	1	15	6	11	9	0	0	16	38	81	0	0	1	2	0	391
428	66	265	5	14	0	10	10	2	6	4	4	3	7	0	12	39	52	1	0	5	2	1	441
512	57	286	3	22	8	5	5	1	6	1	1	0	5	12	18	35	99	1	0	1	2	0	510
407	54	122	1	8	0	1	14	0	7	0	0	0	0	0	23	85	73	0	0	0	8	0	344
263	25	103	7	8	0	0	6	0	7	0	0	0	0	1	7	25	45	0	1	0	0	4	213

Appendix I

SCH #	NS LESS H/E	93-94 FTEE	%STU AC	5 YR AV	5YR EXP/PUP	93-94 EX/PU	AREA SQMI
262	139	2,147	429	18,063	3,486	3,997	83
265	138	2,349	587	22,969	3,738	4,161	65
416	135	2,652	442	31,329	3,582	4,017	156
104	134	194	65	58,334	7,353	7,380	440
233	134	15,832	511	31,031	4,241	4,555	75
441	133	1,064	213	23,176	4,488	5,092	318
465	133	2,566	285	22,904	3,595	4,053	262
313	132	2,199	367	25,403	3,725	4,304	138
443	131	4,470	497	28,158	3,428	3,797	426
202	131	3,786	421	21,844	3,734	4,242	17
101	131	1,169	146	19,348	4,385	4,881	450
427	131	671	224	29,755	4,942	5,533	355
345	129	3,380	307	31,541	3,576	3,969	84
493	129	1,371	196	25,726	4,277	4,712	354
333	127	1,331	266	21,381	4,203	4,670	336
284	123	557	186	39,920	4,638	5,859	780
214	122	1,699	340	134,926	4,306	4,720	517
430	122	698	233	20,715	4,871	5,539	156
240	121	469	117	26,557	4,992	5,861	269
453	119	4,324	393	22,745	3,465	3,789	17
315	119	1,301	434	31,008	4,046	4,620	463
383	117	6,457	538	25,781	3,454	3,939	163
470	116	3,043	338	20,040	3,589	4,099	200
367	114	1,138	284	16,668	4,292	4,829	103
497	112	8,919	425	36,957	3,781	4,261	149
402	108	2,193	439	16,792	3,352	3,735	70
466	105	1,073	268	39,402	4,542	5,066	756
469	103	1,916	383	16,873	3,754	3,969	49
413	103	1,995	285	17,438	3,593	3,943	125
353	101	2,028	290	19,270	3,558	3,940	229
248	98	1,126	375	18,324	4,070	4,983	263
305	95	7,335	306	24,537	3,441	3,724	93
268	94	666	222	22,771	4,501	5,467	126
234	92	2,105	526	19,345	3,371	3,838	300
445	92	2,541	282	22,343	3,565	3,843	120
501	90	13,955	377	30,876	3,799	4,201	35
259	89	44,792	415	33,329	3,922	4,486	151
261	89	3,583	597	16,297	3,505	4,067	36
389	88	849	212	27,901	4,987	5,282	580
437	88	4,691	586	34,462	3,380	3,835	128
232	86	1,830	305	27,311	3,955	4,402	100
500	85	21,002	429	20,035	3,821	4,473	59
373	82	3,467	315	19,626	3,604	3,996	134
385	80	1,990	497	23,592	3,666	3,956	47
435	79	1,480	296	21,236	4,052	4,373	77
457	79	6,745	397	25,725	3,406	3,942	928
290	79	2,329	333	18,937	3,290	3,746	116
250	78	2,959	423	19,899	3,306	3,739	43
503	77	1,936	323	15,734	3,632	4,116	51
480	76	3,804	380	30,724	3,464	3,765	205
446	70	2,327	465	23,583	3,437	3,762	211
428	66	3,394	377	26,068	3,353	3,792	190
512	57	30,537	536	50,946	4,207	4,550	72
407	54	1,205	151	45,467	4,854	5,172	792
263	25	1,918	480	13,090	2,868	3,739	82

Appendix J

Charts

Normal Probability Plots:

a. School District Size (FTEE ENR 5 Yr)
(Full Time Enrollment, Five-Year Average)
b. Expenditure & Transfers/Pupil 93-94 (TXP9394)
c. Assessed Valuation/Pupil 5 YR AVG (Avp5yr)

Chart by Average Number of Students per Attendance Center:

d. Electricity Costs/Pupil (5 Yr Avg) by Avg # Students per Building Kansas (OM5YR622)

Charts by School District Size:

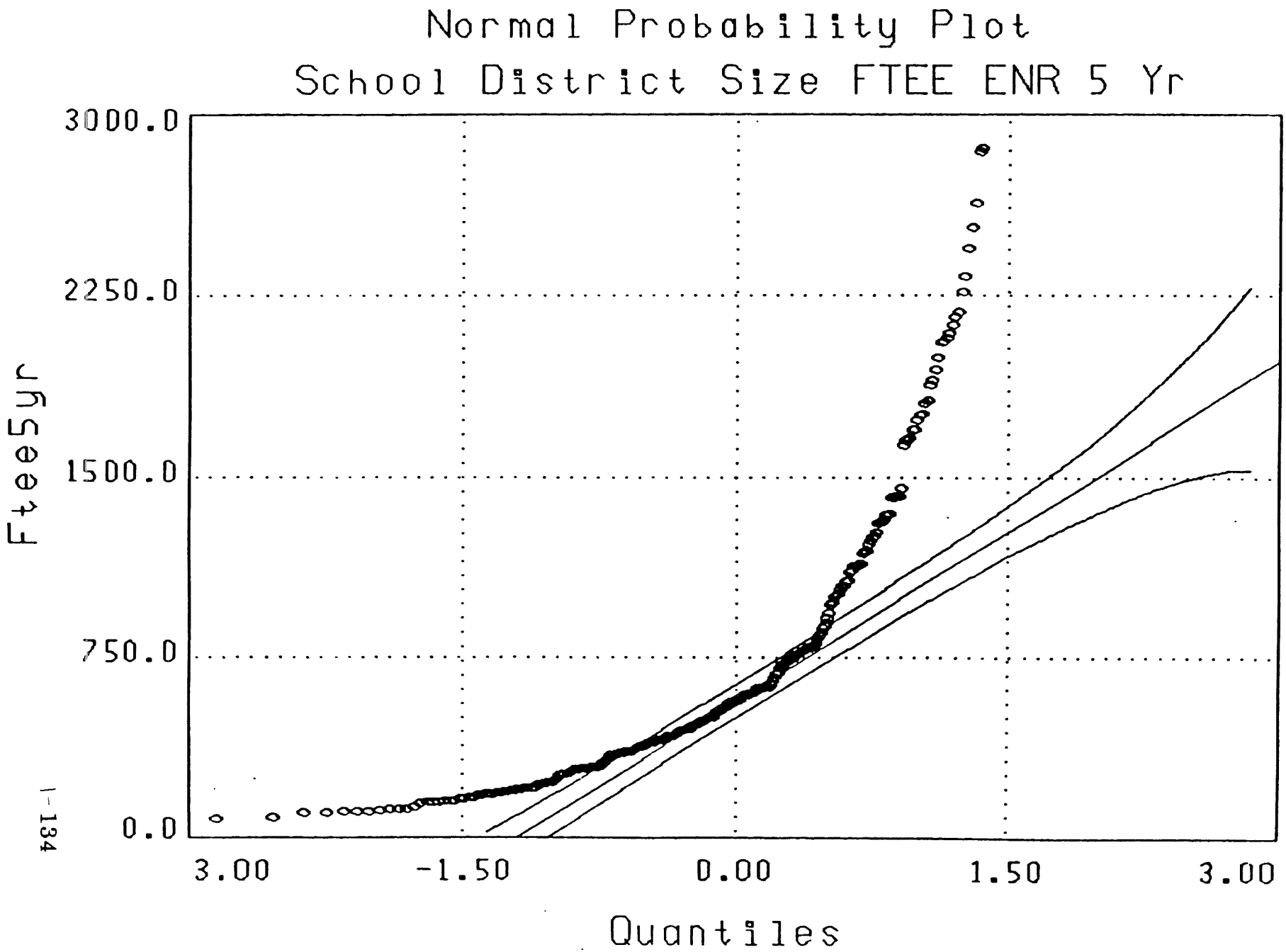
e. Electricity Costs/Pupil (5 Yr Avg) by Kansas School District Size (OM5YR622)
(The codesize is the same as in the tables representing school district size.)

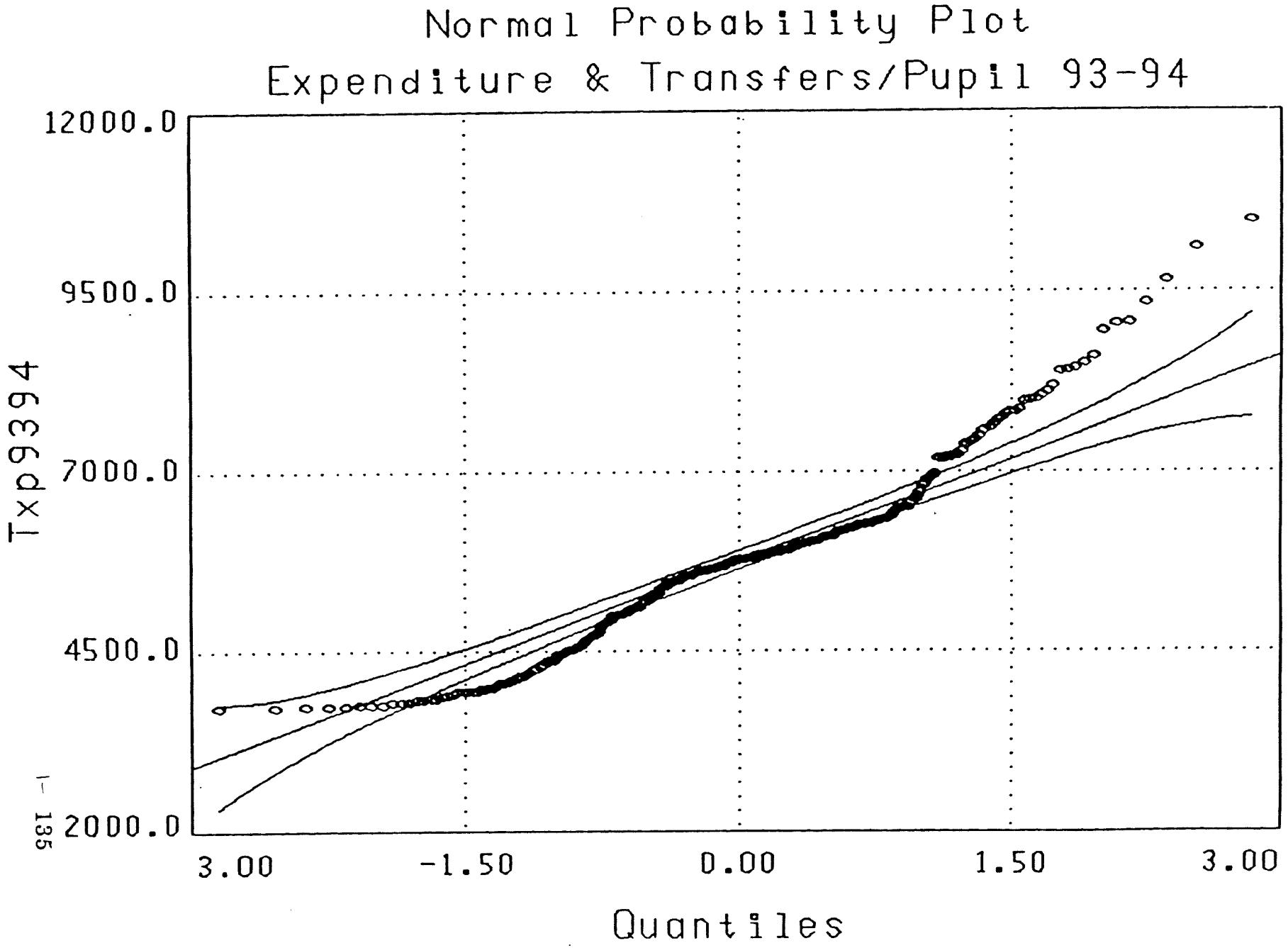
f. Repair of Buildings/Pupil (5 Yr Avg) By School District Size - Kansas (OM46OP94)

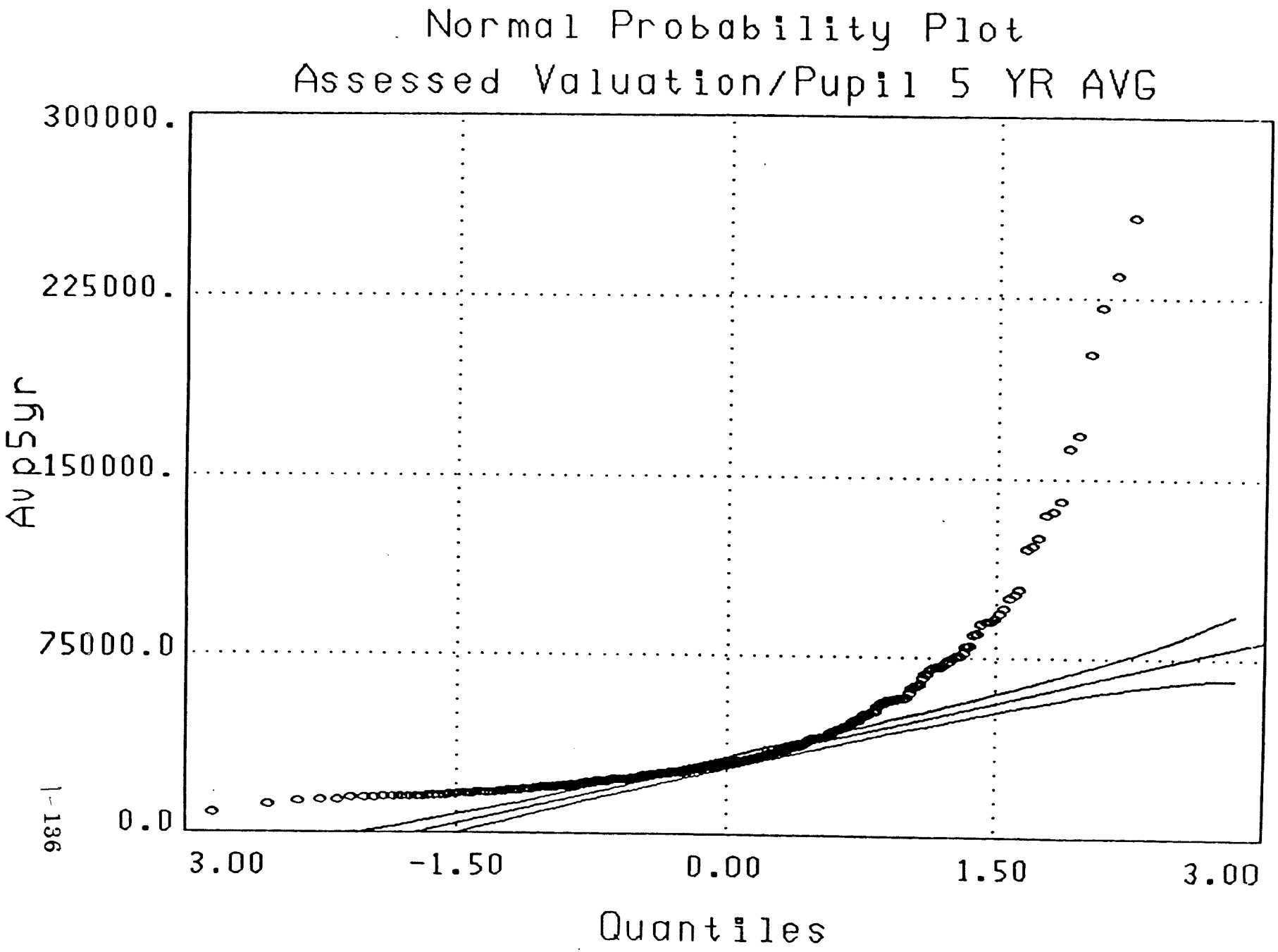
g. Repairs & Maintenance/Pupil 5 Yr Avg By School District Size - Kansas (OM43OP94)

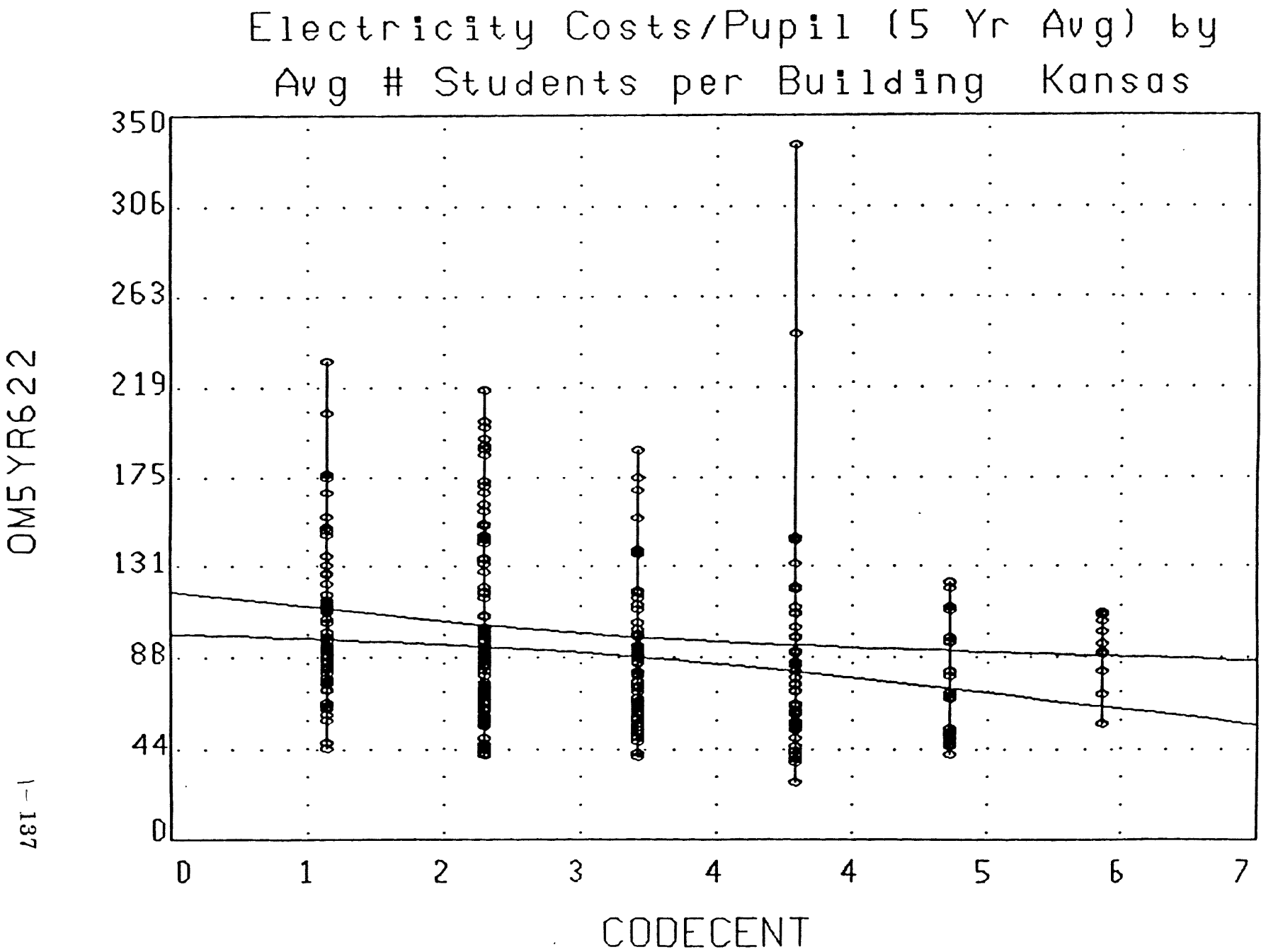
h. O&M Property & Equip/Pupil (5 Yr Avg) By School District Size - Kansas (OM400P94)

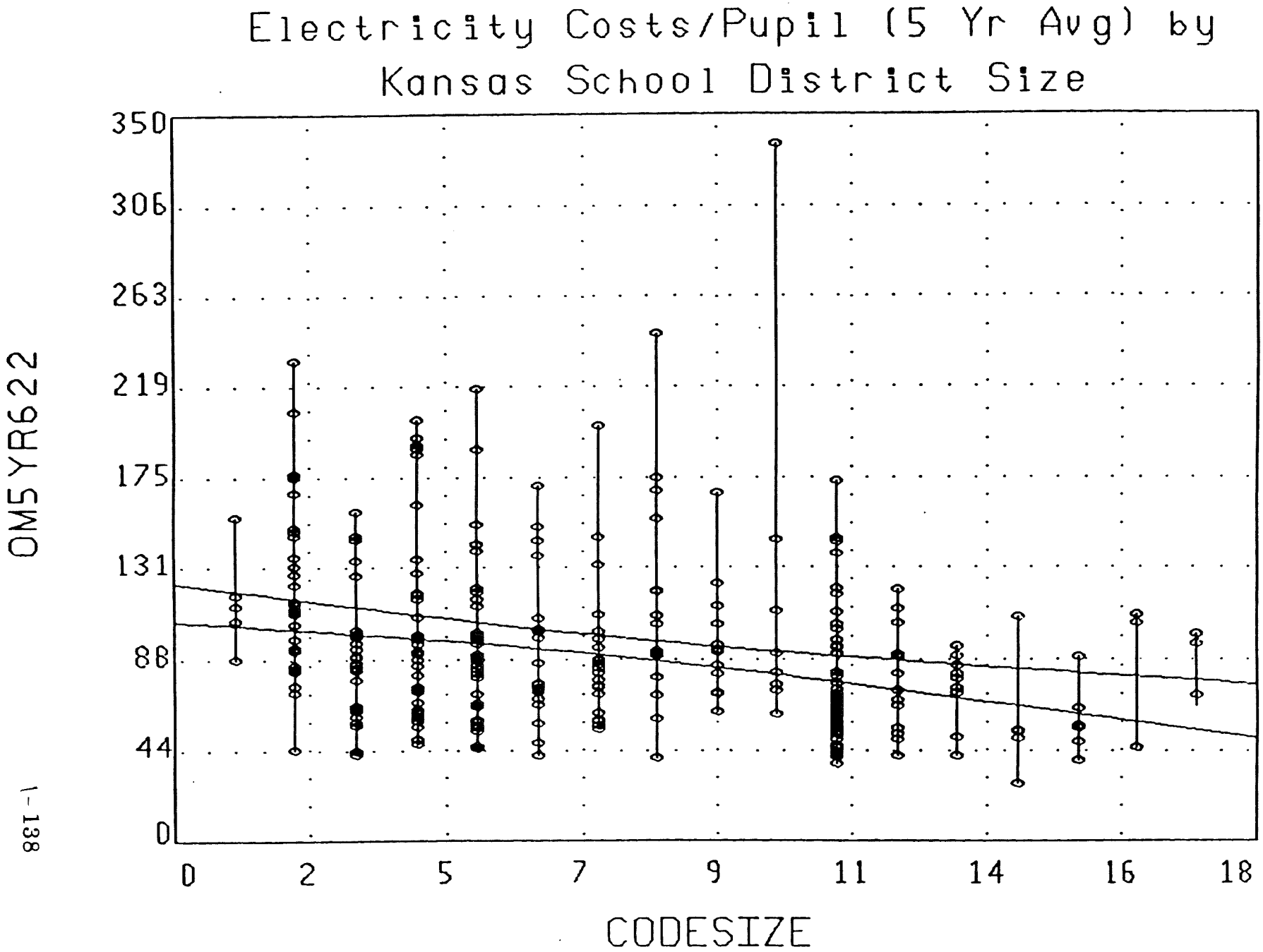
I. O&M Insurance Non-Cert/Pupil, 5 Yr Avg By School District Size - Kansas (OM210P94)

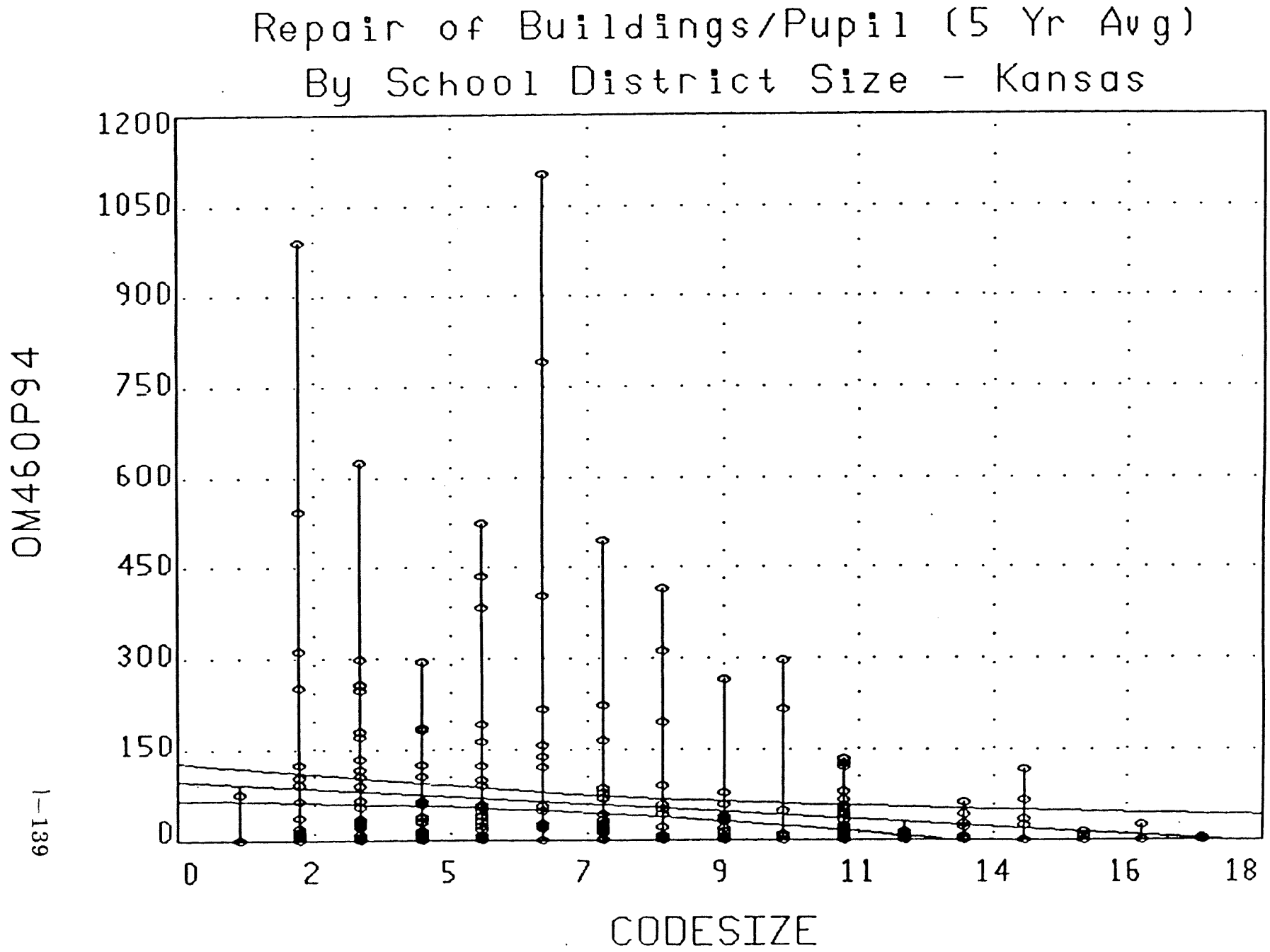

Normal Probability Plot
School District Size FTEE ENR 5 Yr
3000.0
2250.0
1500.0
750.0
0.0
Ftee5yr
3.00
-1.50
0.00
1.50
3.00
Quantiles

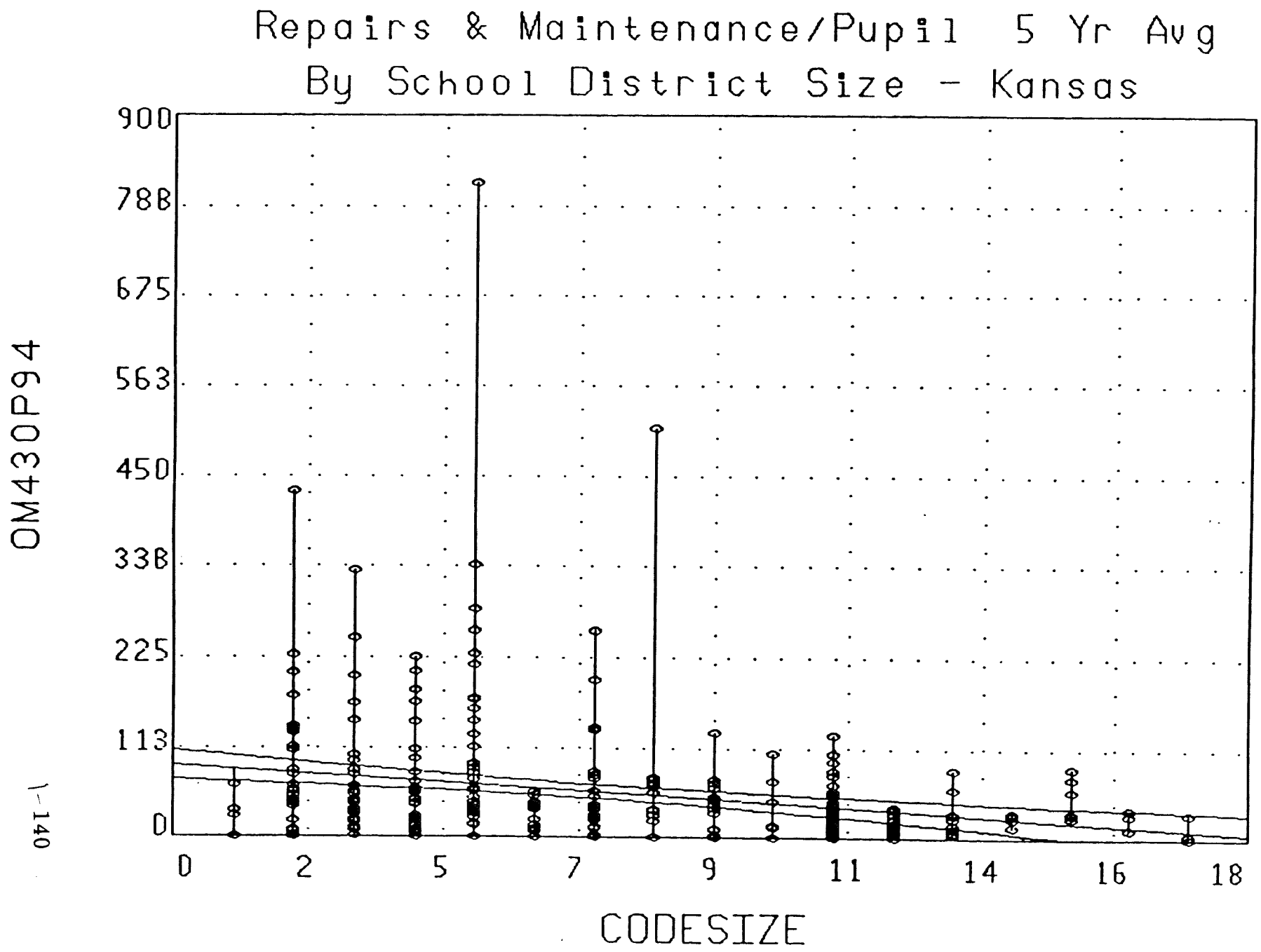

Normal Probability Plot
Expenditure & Transfers/Pupil 93-94
12000.0
9500.0
7000.0
4500.0
2000.0
Txp9394
3.00
-1.50
0.00
1.50
3.00
Quantiles

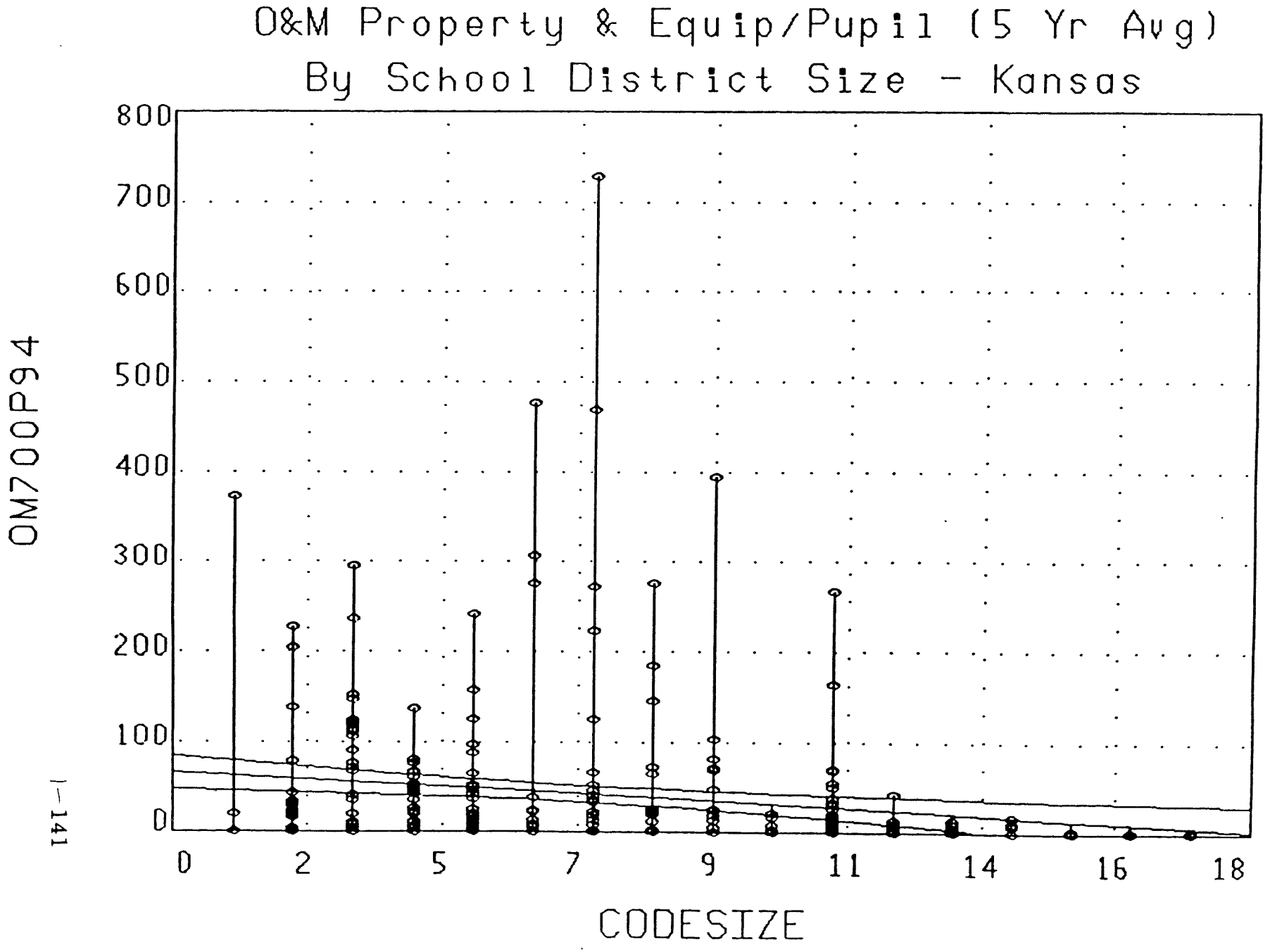

Normal Probability Plot
Assessed Valuation/Pupil 5 YR AVG
300000.
225000.
150000.
75000.0
0.0
Avp5yr
3.00
-1.50
0.00
1.50
3.00
Quantiles

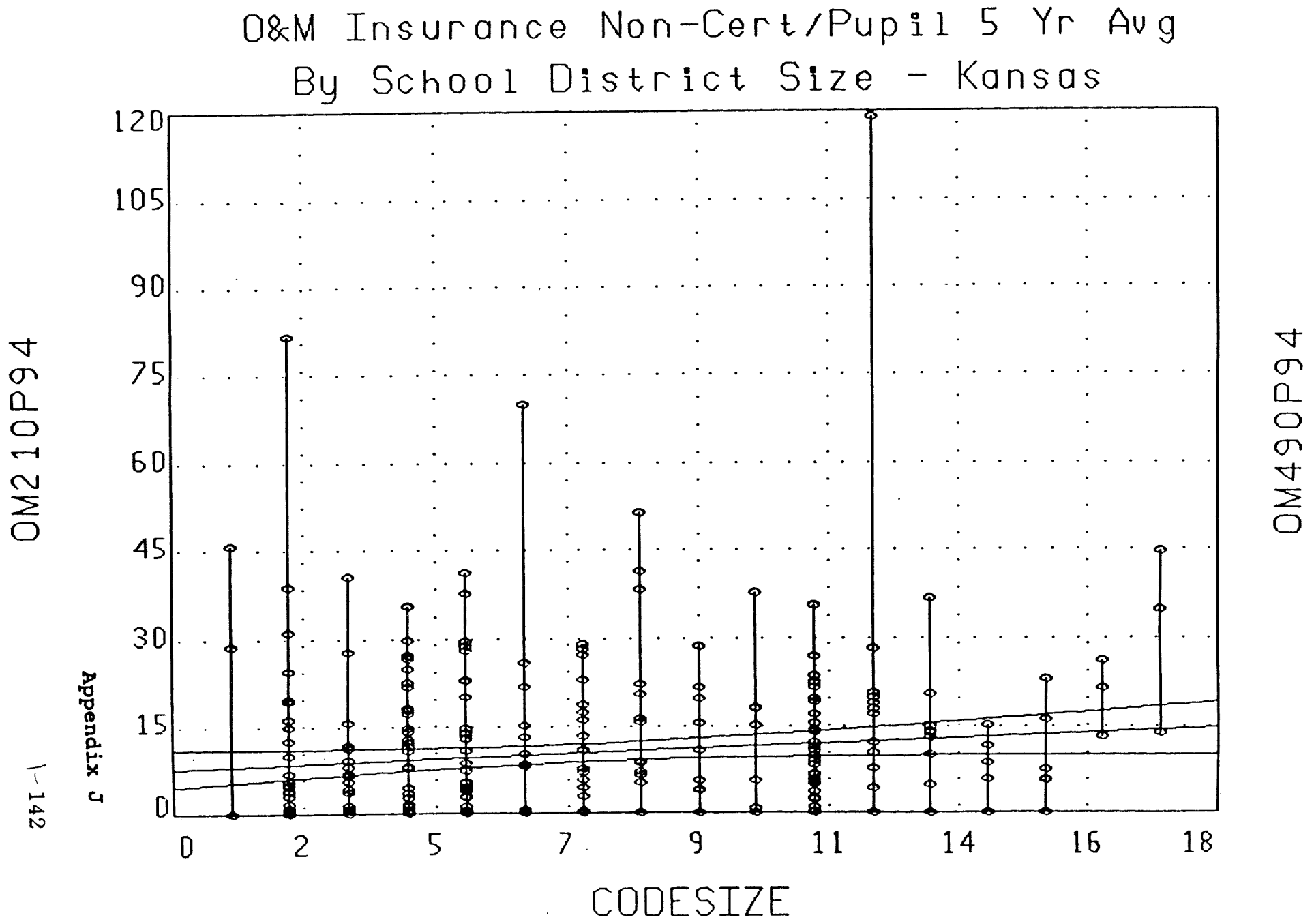

Electricity Costs/Pupil (5 Yr Avg) by
Avg # Students per Building Kansas
OM5YR622
350
306
263
219
175
131
88
44
0
0
1
2
3
4
4
5
6
7
CODECENT


Electricity Costs/Pupil (5 Yr Avg) by
Kansas School District Size
OM5YR622
350
306
263
219
175
131
88
44
0
0
2
5
7
9
11
14
16
18
CODESIZE


Repair of Buildings/Pupil (5 Yr Avg)
By School District Size - Kansas
OM460P94
1200
1050
900
750
600
450
300
150
0
0
2
5
7
9
11
14
16
18
CODESIZE


Repairs & Maintenance/Pupil 5 Yr Avg
By School District Size - Kansas
900
788
675
563
450
338
225
113
0
0
2
5
7
9
11
14
16
18
CODESIZE
OM430P94


O&M Property & Equip/Pupil (5 Yr Avg)
By School District Size - Kansas
OM700P94
800
700
600
500
400
300
200
100
0
0
2
5
7
9
11
14
16
18
CODESIZE


O&M Insurance Non-Cert/Pupil 5 Yr Avg
By School District Size - Kansas
OM210P94
OM490P94
120
105
90
75
60
45
30
15
0
0
2
5
7
9
11
14
16
18
CODESIZE

MEMORANDUM

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December 21, 1994

SUMMARY OF THE BASS-HUGHES FINDINGS AND RECOMMENDATIONS CONCERNING AN ECONOMY OF SCALE FACTOR FOR LOW ENROLLMENT SCHOOL DISTRICTS

(Report to the Legislative Coordinating Council, December 19, 1994)

Overview

The consultants approached the project from two different perspectives. Dr. Bass used a "qualitative" approach in arriving at his finding and recommendations. This consisted of a review of literature and interviews with Kansas public school superintendents. In contrast, Dr. Hughes relied upon a "quantitative" approach, *i.e.*, statistical analyses of a variety of multi-year Kansas school district data. The result was separate sets of findings and recommendations from the different research techniques and areas of emphasis.

A. The Qualitative Analysis

Finding

- In the literature, there is no consistent definition of the term "small" as the term applies to schools or school districts. Furthermore, the interview process failed to provide persuasive evidence relative to the appropriate, or acceptable size criterion for a low enrollment weight factor.

Recommendations

- Terminology in the Kansas law should be changed from "low enrollment" to "district size." This is because the formula really provides funding levels according to district size. In Kansas, "low enrollment" applied to districts up to 1,900 is something of a misnomer.

- In the event the low enrollment weighting adjustment is changed so that any district having an enrollment of fewer than 1,900 pupils loses funding, the change should include a "hold-harmless" provision that allows three to five years for affected districts to make adjustments in programs and budgets or to seek Local Option Budget (LOB) authority to cover the loss.

- The Legislature should consider whether to link the LOB with the low enrollment weighting to provide a state-local split in funding, particularly for school districts which are not isolated.

  Comment. While not explicitly stated, at this point the consultant clearly implies that the Kansas low enrollment weight provision is too inclusive and, that in addressing this issue, distinction should be made between districts having low enrollment due to geographic isolation and other low enrollment districts. In this respect, the consultant states:

  - continuing to provide low enrollment weighting to all small districts provides a financial disincentive to such districts which might otherwise consider reorganization;

  - use of a geographic isolation factor and holding nonisolated districts locally responsible, at least in part, for supplemental funding would:

    - reduce the state's cost of this portion of the financing plan,

    - eliminate or reduce the financial disincentive to school district reorganization, and

    - allow nonisolated small districts to remain in operation at the option and expense of local residents.

B. The Quantitative Analysis

Findings

Statement of Limitations and Procedures Followed. The consultant emphasized the difficulty presented in determining through statistical analysis the relationship between school district size and expenditure levels attributable to economy of scale, independent of the influence of past legislative policies. Put differently, past legislative policies have recognized and supported the notion of higher costs of low enrollment districts. The challenge adopted by the consultant was not simply to document from the data that past legislative policies have produced the intended results; rather, it was to identify economy of scale factors that exist independently from the influence of past policies. In this regard, the consultant moved through the following steps:

- excluded salary related expenditures from the study (because they strongly reflect past legislative history), and

- concentrated on operations and maintenance (O&M), certified personnel, and noncertified personnel. (O&M represented about 15 percent of total expenditures.)

(a) O&M Analyses

- Found that the O&M category as a whole could not be used because districts of the same size have vastly different building expenditures per pupil and districts of different sizes had the same per pupil building expenditures.

- Explored the 21 categories within O&M to determine those used by virtually all districts that did not reflect past total expenditure and transfer history and that were not related to local wealth and school district size; *i.e.*, that were an unbiased measure of O&M costs among all districts.

- Found that, except in districts with more than $101,000 assessed valuation per pupil, only per pupil electricity costs (an O&M category) was both an unbiased expenditure item and an expenditure found to exist in all school districts; that is, an expenditure not representative of past expenditure history, school district size, or local wealth.

  (For 1993-94, the district cost per pupil of electricity equates to about 2.0 percent of total average per pupil costs.)

- Recommended a nonsalary related O&M adjustment for all school districts in which electricity costs per pupil exceed the statewide median percentage of electricity costs per pupil. An exception to such an adjustment would be districts with an assessed valuation per pupil two standard deviations above the mean. For these districts, either no adjustment or a modified adjustment would be made.

  (See also listing of recommendations (below).)

(b) Certified Personnel

- Examined Kansas school district certified personnel data in order to define an equivalent educational program offered by a majority of Kansas school districts.

- Determined the minimum number of instructional certified personnel necessary for a "one unit" educational program to be 16 persons -- one kindergarten teacher, 12 classroom teachers, one school counselor, one library media person, and one reading specialist. (See listing of recommendations (below).)

- Explained that a minimum school district size can be determined if the minimum ratio of students to instructional personnel is stipulated. For

example, based on a student/instructor ratio of 6:1, the minimum enrollment would be 96 students.

- Stated that school districts with more than the minimum number of students recommended by the state as a small school would not need additional funding to support an equivalent educational program, as their student numbers would support the staff required.

- Cautioned that a limitation of the type of recommendation above would be that Kansas would need to totally revamp its method of funding schools by moving to a formula based on staffing ratios and by establishing a state salary schedule.

Consolidated Recommendations from the Quantitative Analyses

- An adjustment to O&M of districts should be applied, based on the median percentage of electricity costs per pupil to nonsalary related O&M costs per pupil. This adjustment should apply to all school districts that have above the median percentage of electricity costs to nonsalary related O&M, based on a five year average. This adjustment is considered appropriate because nonsalary related O&M cost per pupil varies across school districts and electricity cost per pupil remains constant.

- Low enrollment weighting would be set at the minimum school district size that would support the 16 certified instructional staff necessary for an equivalent educational program provided by a majority of the school districts in the state.

  (For example, if the Legislature chose to establish a student to certified instructional personnel ratio of 6:1, the minimum school district size would be 96 enrollment. School districts with less than 96 enrollment would receive low enrollment weighting funds.)

  The majority of the low enrollment weighting funds would be equally distributed on a per pupil basis across the school districts of the state. The base amount of $3,600 per pupil would be increased in equal per pupil amounts for all school districts.

- Only salary related expenditures should be allocated through the present low enrollment weighting formula. This is because nonsalary related expenditures are not a function of school district size. The remaining amount of low enrollment weighting funds should be allocated in equal per pupil amounts to all school districts in the state.

ATTACHMENT I

WHAT THE QUANTITATIVE ANALYSES REVEALED CONCERNING THREE RESEARCH QUESTIONS

1. **Question**. Is there a relationship between school district enrollment size and expenditure levels?

   Answer. Yes, by 1993-94, 92 percent of the variation in expenditure data could be attributed to school district size.

   A separate analysis of nonsalary related data produced the finding that there is a relationship between school district enrollment and expenditures with variables that are related to past expenditure history, but not with variables that are not related to past expenditure history.

2. **Question**. Are differences in school district expenditures due to enrollment size or other factors?

   Answer. Variations are due mostly to enrollment size.

   A separate analysis of nonsalary related data indicate differences are due to school districts spending greater per student amounts relative to other school districts and not to school district size.

3. **Question**. At what school district enrollment size does economy of scale account for a difference in expenditures?

   Answer. No general or specific answer was given. The consultant stated:

   "There does not appear to be a significant relationship between nonsalary related expenditures and school district size. Examining salary-related expenditures was beyond the bounds of the study."

Multi-phased Study of an Economy of Scale Weight Factor for Low Enrollment School Districts in the State of Kansas

Executive Summary

Mary F. Hughes

Gerald R. Bass

Presented to the

Legislative Coordinating Council,

Kansas Legislature

December 19, 1994

In the development of the School District Finance and Quality Performance Act (hereinafter referred to as the "Act"), the Kansas Legislature included a weighting factor for low enrollment districts, defined as those with fewer than 1,900 students. On December 16, 1993, Judge Marla J. Luckert ruled that the low enrollment weighting in the Act did not "contain a rational basis grounded upon education theory." The Act was then ruled to be unconstitutional because the low enrollment weighting was not deemed to be severable.

On April 27, 1994, the Kansas Legislative Coordinating Council (LCC) executed a contract with Drs. Mary Hughes and Gerald Bass to study the low enrollment weighting and to make recommendations to the LCC and the Kansas Legislature regarding "an appropriate economy of scale weight factor for low enrollment school districts to document a rational basis for providing additional revenue to low enrollment school districts. This document has been provided as a summary of the final report pursuant to that contract.

Included in this summary are, first, the findings and conclusions developed by Dr. Bass through a review of the literature and the qualitative data collection through interviews with Kansas public school superintendents. Following that is a similar section from Dr. Hughes' quantitative data analysis. The final portion of this summary contains the recommendations developed from those findings.

Summary of the Qualitative Data Analysis

From the review of the literature, it has been concluded that:

1. there is no consistent definition of "small" as the term applies to schools or school districts;

2. small schools and/or school districts will generally incur higher per-pupil costs if they fulfill an expectation to provide an educational program equivalent to that offered in larger districts;
3. probably the most significant factor in such higher per-pupil costs is the lower pupil-teacher ratios encountered in the smaller schools;
4. state policies reflect varied approaches to dealing with small schools, from intolerance and forced consolidation to the provision of supplemental funding to all qualifying districts; and
5. many states which provide such funding do so only to school districts which meet criteria for both size and isolation.

The qualitative data collection failed to provide persuasive evidence relative to the appropriate, or acceptable, size criterion for the low enrollment weighting factor. Among the few who did provide responses relevant to that point, most superintendents in currently eligible districts did not want to change the existing 1,900 criterion and those in districts with more than 1,900 students tended to report a need to lower the figure but not to have a specific number or range to recommend. Superintendents in districts receiving low enrollment weighting also agreed that the funding level from that source was appropriate and allowed their districts to provide appropriate and effective educational programs while those in larger districts perceived the low enrollment funding as distributing too much money to too many school districts.

Summary of the Quantitative Data Analysis

The purpose of the data analysis was to (1) ascertain the magnitude of the relationship between school district enrollment size and expenditure levels; (2) determine the extent to which economy of scale accounts for such relationship; and (3) document a rational basis for providing additional revenue to low enrollment school districts.

The research questions to be explored were:

1. Is there a relationship between school district enrollment size and expenditure levels?
2. Are differences in school district expenditures due to enrollment size or to other factors?
3. At what school district enrollment size does economy of scale account for a difference in expenditures?

To answer the three research questions, five years of school data for the years 1989-90 to 1993-94 were examined. Specific information such as Expenditures and Transfers per Pupil and salary related expenditures could not be used in the analysis because they represented past legislative history. It was felt that the results from an examination of past legislative history data would be a direct reflection of the existing system.

The statement of the problem guided the direction for areas of investigation.

> Low enrollment weighting recognizes and compensates for the higher fixed and operating costs per pupil necessary to provide an education program in low enrollment districts of less than 1,900 enrollment in the State of Kansas.

Such costs include:

(1) Basic educational programs and services,
(2) Repair and maintenance of facilities,
(3) Administration,
(4) Support and instructional staff, and
(5) Equipment and other overhead.

From an examination of state school expenditures by expenditure categories, 74 percent of total expenditures (transfers excluded) could be attributed to Instructional and School Administration categories. The major remaining expenditure category was Operations and Maintenance, which had strong elements of the costs included in the statement of the problem and accounted for 59 percent of the remaining expenditures.

Findings of the Data

1. The data analysis was based on five years of Kansas school data. Throughout this study, school districts were not identified by name. In essence, this part of the study was a blind review of the school districts.

2. Data related to past expenditure history could not be used in the data analysis. Therefore, Expenditure and Transfers per pupil and Salary related data were omitted in analyzing the problem.

3. The greatest statistical problem encountered was the non-normality of many of the variables or data that contained serious outliers or were non-linear (see attached charts). In the measure of relationships, a basic assumption that underlies the use of the Pearson correlation analysis is that two variables have a linear relationship. Pearson is inappropriate to describe a curvilinear relationship. For this data study, rank order correlation analysis was incorporated along with the Pearson.

4. The greatest challenge was in identifying an expenditure area that was not reflective of past expenditure history.

5. From 1989-90 to 1993-94, the relationship between Expenditures and school district size has increased, as noted in the increase of the rank order correlation coefficients from -.86 to -.96. This indicates that in 1989-90 approximately 74 percent of the variation in expenditures could be attributed to school district size and by 1993-94, 92 percent of the variation in expenditure data could be attributed to school district size.

6. From the analysis of the data, it was found that school district size was not significantly related to land area in square miles, percentage of students bused greater than 2.5 miles, or assessed valuation of property per pupil. It was found that school districts with less than 100 students per attendance center could have as little as 10 square miles of land area or 688 square miles; that from 16 to 84 percent of the students could be bused greater than 2.5 miles; and that assessed valuation per student could be as small as $21,000 and as large as $449,000. In summary, there was no pattern in what constitutes a small school district other than the state designation of less than 1,900 enrollment.

7. Operations and maintenance was chosen as the base element of this study for the following reasons:
   a. A reference point had to be chosen that was relative to all the school districts in the state.
   b. The reference point could not reflect past legislative history of the funding formula.
   c. The reference point needed to be one that was free of the influence of local choice and local wealth, would remain constant over time, and was a necessary function of the basic school operation.

   Operations and Maintenance represents 58 percent of the expenditures that remain after Instructional and Administration categories have been removed.

8. Expenditures for Operations and Maintenance consist of 21 categories with four of the categories salary related. Of the 21 categories, Non-certified salaries, Repair of Buildings, Electricity costs, Equipment and Furniture, Rentals, Heating costs, and Repairs and maintenance had the strongest

influence on the differences in Operations and Maintenance costs per pupil among the school districts.

9. Over a five year period, 1989-90 to 1993-94, 60 percent of the school districts reported Repair of Buildings as an expenditure. In 1993-94, the average cost per pupil for Repair of Buildings ranged from $2 to $1,103, with 111 school districts reporting zero amounts for this category (see Table 8 attached).

10. In 1993-94, 84 percent of the school districts reported Repairs and Maintenance as an expenditure with costs ranging from sixty cents ($0.60) to $817 per pupil. Thirty-two school districts reported zero amounts for this category. Seventy-five percent (75 percent) of the school districts participated in the category Equipment and Furniture in 1993-94 compared to 57 percent in 1989-90. The per pupil amount expended for Equipment and Furniture in 1993-94 was from $5 to $807, with 77 school districts reporting zero amounts (see Table 9 attached).

11. The five year average for Total Operations and Maintenance per Pupil was $547, with a range between $212 to $1,239 per pupil. Total Operations and Maintenance per pupil could not be used as the main source of the examination because too many school districts had not participated in all the 21 categories over the five year period.

12. It was found that salary related operations and maintenance costs and heating costs were strongly related to past expenditure history.

    Electricity costs per pupil and a composite of the remaining 15 operations and maintenance categories were found not to be related to past expenditure history. But, only electricity cost per pupil was representative of all the school districts. The remaining 15 O&M categories had school district category participation rates from 34 percent to 84 percent.

13. Electricity costs per pupil has a low relationship to total expenditures and transfers per pupil and to local wealth (except for school districts with greater than $101,000 assessed valuation per pupil). From the analysis of five years of data, it was found that Electricity cost per pupil, more so than any of the non-salary related operations and maintenance costs, represents the most unbiased measurement of school district expenditures.

14. For Kansas data, Electricity cost per pupil represents the most unbiased measurement of the relationship between school district expenditures and school district size.

    Electricity cost per pupil represents an example of how expenditures react across school district size when expenditures are not related to the influence of past legislative history.

    The importance of this concept is not the magnitude of the expenditure, but how the legislature acts when it is not related to past legislative history.

15. When incorporating an unbiased measurement, for comparing school district size and expenditures, the data indicate that school district size is not a significant factor in non-salary related costs per pupil in the state of Kansas.

16. When school districts are compared on data that represent past expenditure history, the school districts have a strong relationship with expenditures and school district size.

17. After examining five years of data for the 21 operations and maintenance categories, it was found that differences in the non-salary related categories were due to school districts with high expenditures spending greater amounts of money per pupil in a greater number of the categories than school districts with low expenditures. School district size was not a significant factor in the differences in non-salary related operations and maintenance expenses, except for heating costs per pupil. Heating costs per pupil were found to be reflective of past legislative history and local wealth.

18. The most concrete example of high expenditure school districts spending more money per pupil in a greater number of the non-salary related operations and maintenance categories than low expenditure school districts is to actually look at the differences by category by school districts.

    On 15 non-salary related operations and maintenance expenditure categories, the five year average for the highest expenditure school district is $710 per pupil compared to $25 per pupil for the lowest expenditure school district. The highest expenditure school district spends $338 per pupil on Rentals, the lowest spends zero; the highest spends $125 per pupil on Repair of Buildings, the lowest spends zero; the highest spends $28 per pupil on Equipment and Furniture, the lowest spends zero; and the highest spends $36 per pupil on General Supplies and the lowest spends $7 per pupil. There is a difference in school district size: the highest spending school district has an enrollment of 246 and the lowest, 1,918. The difference in the $710 per pupil expenditures and the $25 per pupil cannot be attributed to the difference in school district size. It can only be attributed to one school district spending a greater amount of money in a greater number of categories than the other school district.

    Another example, one school district with an enrollment of 822 and one with an enrollment of 21,000. The 822 enrollment school district has a per pupil expenditure in the 15 non-salary operations and maintenance categories of $523 and the 21,000 enrollment size has a per pupil expenditure of $85 per student. We ask again, is the difference in expenditure due to school district size or to one school district spending a greater amount of money in a greater number of the categories than another school district. The highest spending school district spends $206 per pupil on Rentals, $73 per pupil on Repair of Buildings, $62 per pupil on General Supplies, and $82 per pupil on Equipment and Furniture. The lowest spending school district spent zero on Rentals, zero on Repair of Buildings, $10 per student on General Supplies, and $2 per student on Equipment and Furniture. The high spending school district has an

average of 164 students per attendance center and the low spending school district has an average of 429 enrollment.

The difference in $525 per student and $85 per student cannot be attributed to school district size, but to one school district spending a greater amount of money in a greater number of categories than the other school district (see Table 27-A attached).

19. Attendance centers of equal enrollment size located in different school districts can have unequal expenditures. The data indicate that expenditures for attendance centers are dependent upon the size of school district in which the attendance center is located.

20. A greater portion of a large school district's non-salary related operations and maintenance budget is consumed by electricity costs than a small school district's. The percentage of electricity cost per pupil to non-salary related operations and maintenance cost per pupil ranges from 8.5 percent for a small school district to 52 percent for a large district.

Specific Answers to the Research Questions

The research questions to be explored were:

1. Is there a relationship between school district enrollment size and expenditure levels?

   From the analysis of five years of non-salary related data and school district size the results indicated the following:

   (1) There is a relationship between school district enrollment size and expenditure levels with variables that are related to past expenditure history; and

   (2) There is no significant relationship between non-salary related expenditures per pupil and school district enrollment size when the non-salary related expenditures are not related to past expenditure history.

2. Are differences in school district expenditures due to enrollment size or to other factors?

   From the analysis of five years of non-salary related data, the results indicate that differences in non-salary related school district expenditures are due to school district spending greater per student amounts relative to other school districts and not to school district size.

   On the surface, there appears to be a size factor related to expenditure levels, but by examining the component parts, the data indicate that high expenditure

school districts have spend greater amounts per pupil in a greater number of the 21 operations and maintenance categories than school districts that have low expenditures. many of the low expenditure school districts have recorded zero amounts or low dollar amounts in many of the 21 operations and maintenance areas. School district size is not a significant factor, other than low enrollment school districts may have had a greater amount of funds to spend per pupil than high enrollment school districts.

3. At what school district enrollment size does economy of scale account for a difference in expenditures?

   There does not appear to be a significant relationship between non-salary related expenditures and school district size. Examining salary related expenditures was beyond the bounds of this study.

   The minimum enrollment size required for a school district to support an equivalent educational program offered by a majority of the school districts in the state was addressed in this study.

   From the analysis of three years of certified personnel data, it was found that for a student ratio of 6 students to 1 certified instructional personnel, a minimum of 96 enrollment would be required to support 16 certified instructional personnel, the required number to provide an equivalent educational program similar to one provided by a majority of the school districts in the state.

   For a student to certified staff ratio of 10.9 to 1, the minimum enrollment size required for a school district to support 16 certified instructional staff would be 174.4.

Recommendations

The consultants conducted separate analyses of data. Dr. Bass focused on the literature and qualitative data while Dr. Hughes was dealing with the quantitative data. From these analysis activities, two sets of recommendations were developed. These are presented below, beginning with the recommendations from the qualitative analysis followed by those from the quantitative analysis.

Recommendations from the Qualitative Analysis

1. The Kansas legislature should change the terminology of "low enrollment" to "district size." The low enrollment weighting is really a misnomer. While the review of literature identified a very wide range of criteria for definition of "small," including sizes far in excess of 1,900, it would seem unlikely that such a large proportion of a state's school districts would be identified as such. If it is assumed that there is a continuum of district sizes from small to large, the criterion in Kansas certainly skews the categorization. On the other hand, there appears to be an historical basis for providing greater funding per-pupil to those school districts with up to 1,900 students. The legislature can clear up the confusion over the designation of low enrollment simply by changing the terminology. Certainly, some critics would complain that the legislature was engaged in an exercise in semantics, but the consultants believe that such a change would simply be an effort toward "truth in advertising" by calling the factor what it really is, a mechanism that provides varying levels of funding according to district size.
2. Any future change in the criterion of 1,900 students for the low enrollment weighting should be accompanied by a hold-harmless provision which would allow time (up to 3-5 years) for leaders in school districts which would lose funding to make adjustments in their budgets and programs or to seek voter approval of LOB authority to compensate for such loss.
3. The Kansas legislature should consider whether to link the LOB with the low enrollment weighting to provide a state-local split in the funding, particular for those school districts which are not isolated. The literature and the experience

of other states indicate that there is considerable conceptual, if not political, support for limiting the state's obligation for funding small school districts that remain small through local choice rather than because of low population density. Continuing to provide the low enrollment weighting to all small districts provides a financial disincentive to such districts which might otherwise consider a reorganization. By establishing a geographical isolation factor and holding non-isolated districts locally responsible, at least in part, for the supplemental funding, the legislature could reduce the state's cost of this portion of the financing plan, eliminate or reduce the financial disincentive to school district reorganization, allow non-isolated small districts to continue in operation at the option (and expense) of the local residents, and ensure that all schoolchildren of the state are provided with a minimum, quality educational program.

Recommendations from the Quantitative Analysis

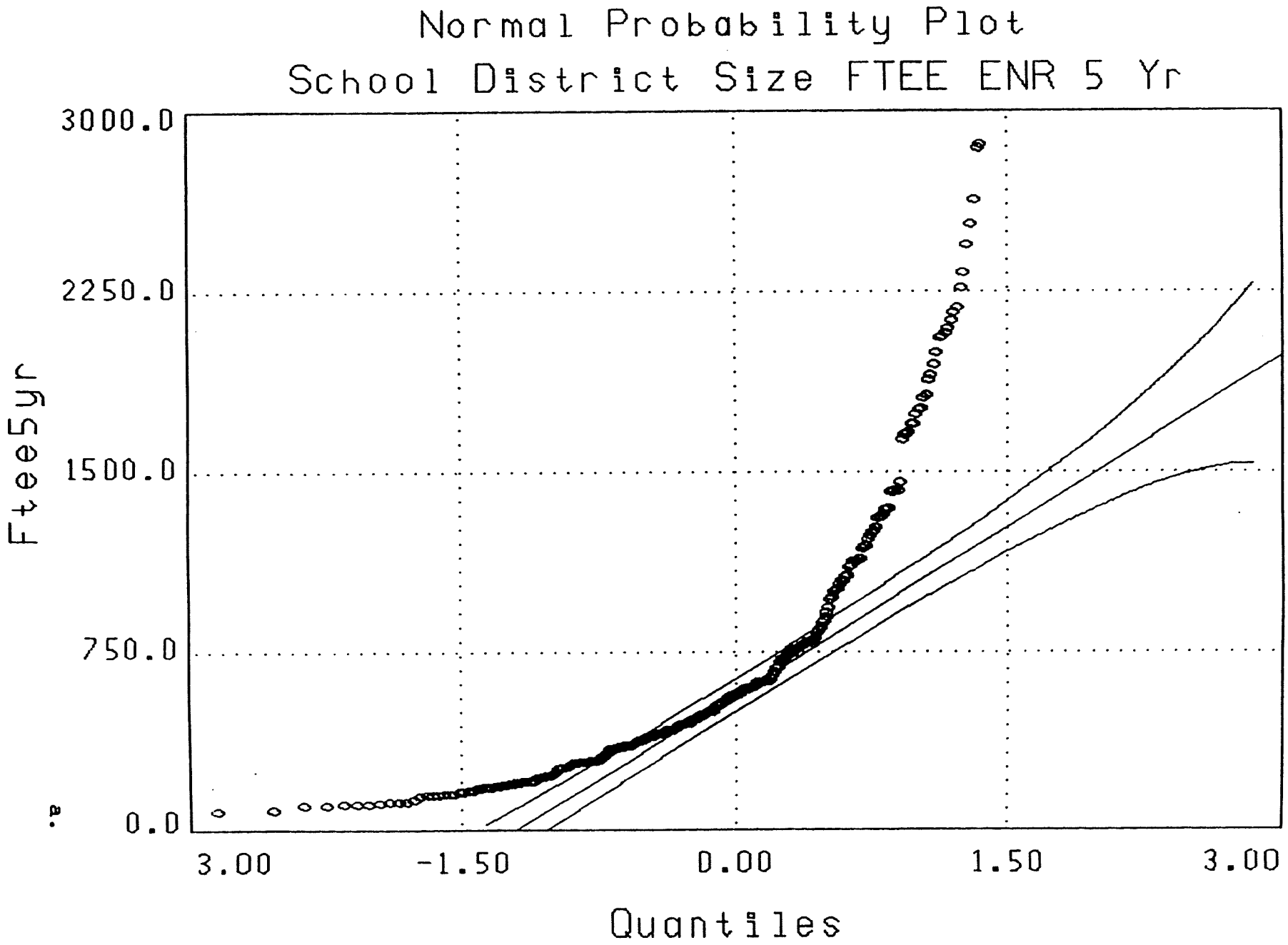
1. Because non-salary related operations and maintenance cost per pupil varies across the school districts and electricity cost per pupil remains constant, an adjustment to operations and maintenance cost is recommended based on the median percentage of electricity costs per pupil to non-salary related operations and maintenance costs per pupil.

   All school districts that have above the median percentage of electricity costs to non-salary related operations and maintenance costs, based on a five year average, would have an adjustment to non-salary related operations and maintenance funding.

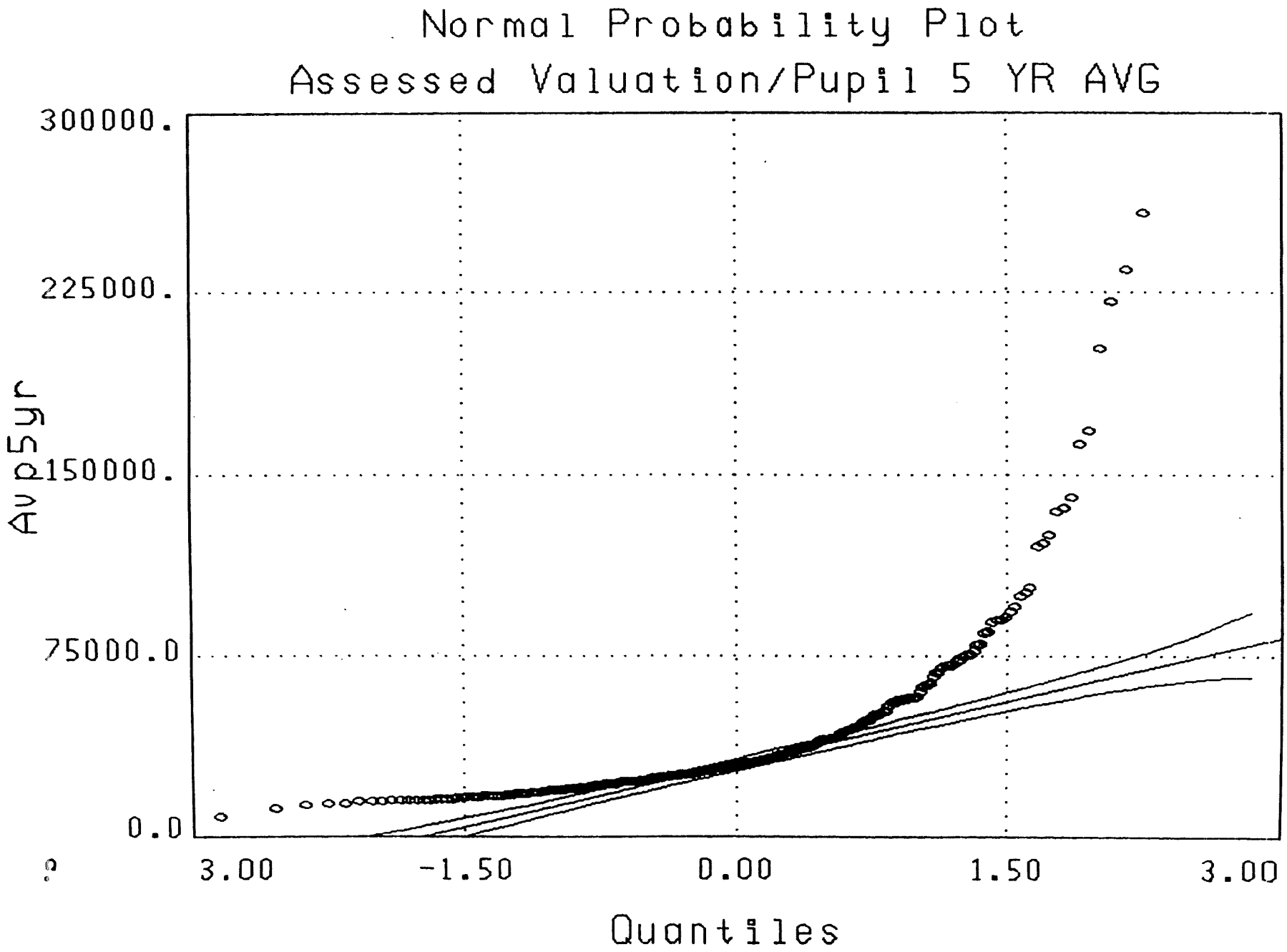
2. Low enrollment weighting would be set at the minimum school district size that would support 16 certified instructional staff required for an equivalent educational program provided by a majority of the school districts in the state. For example, if the state legislature chose to establish a student to certified instructional personnel ratio of 6 to 1, the minimum school district size would be 96 enrollment. School districts with less than 96 enrollment would receive low enrollment weighting funds.

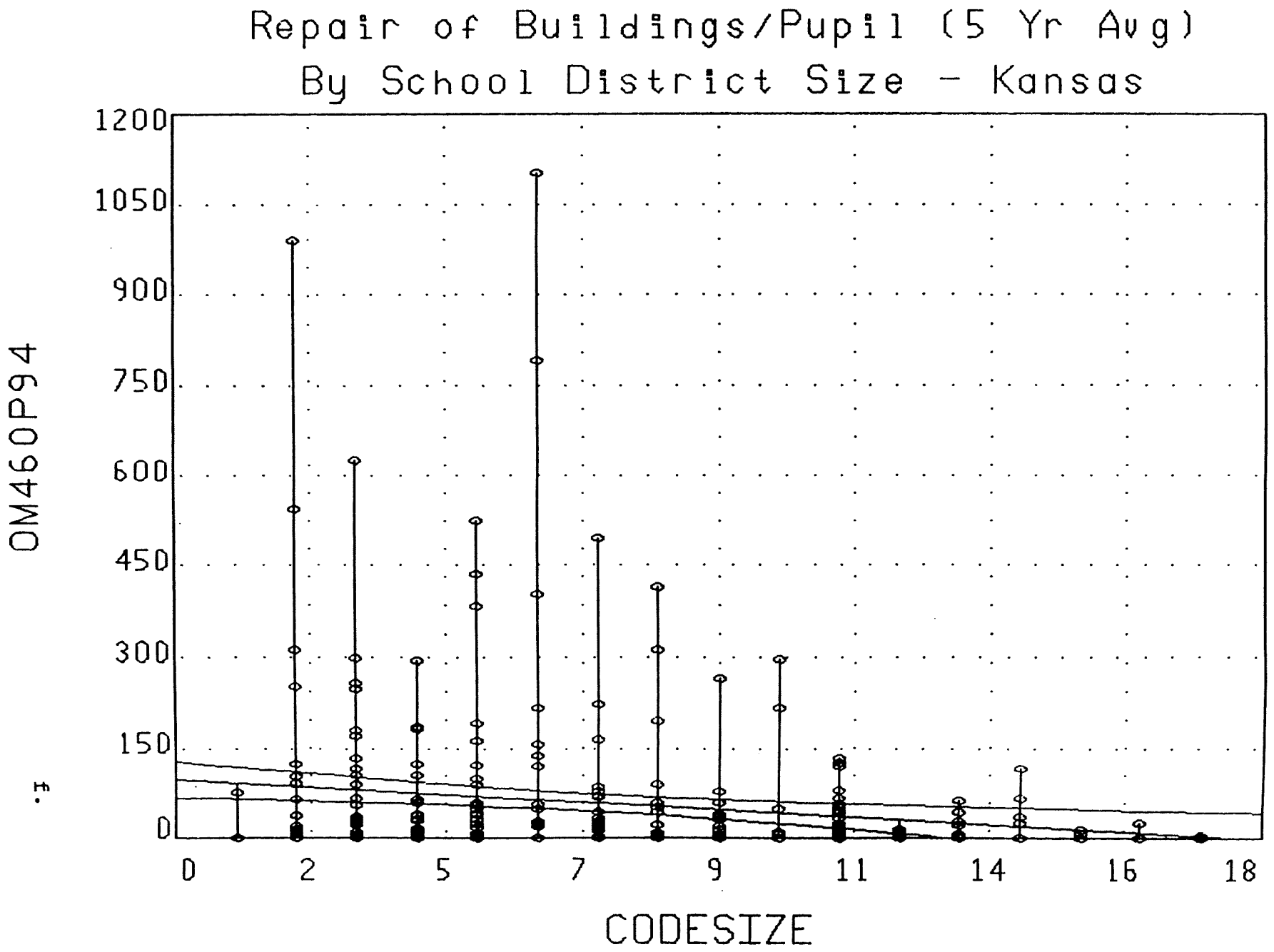
   The majority of the low enrollment weighting funds would be equally distributed on a per pupil basis across the school districts of the state. The base amount of $3,600 per pupil would be increased in equal per pupil amounts for all the school districts.

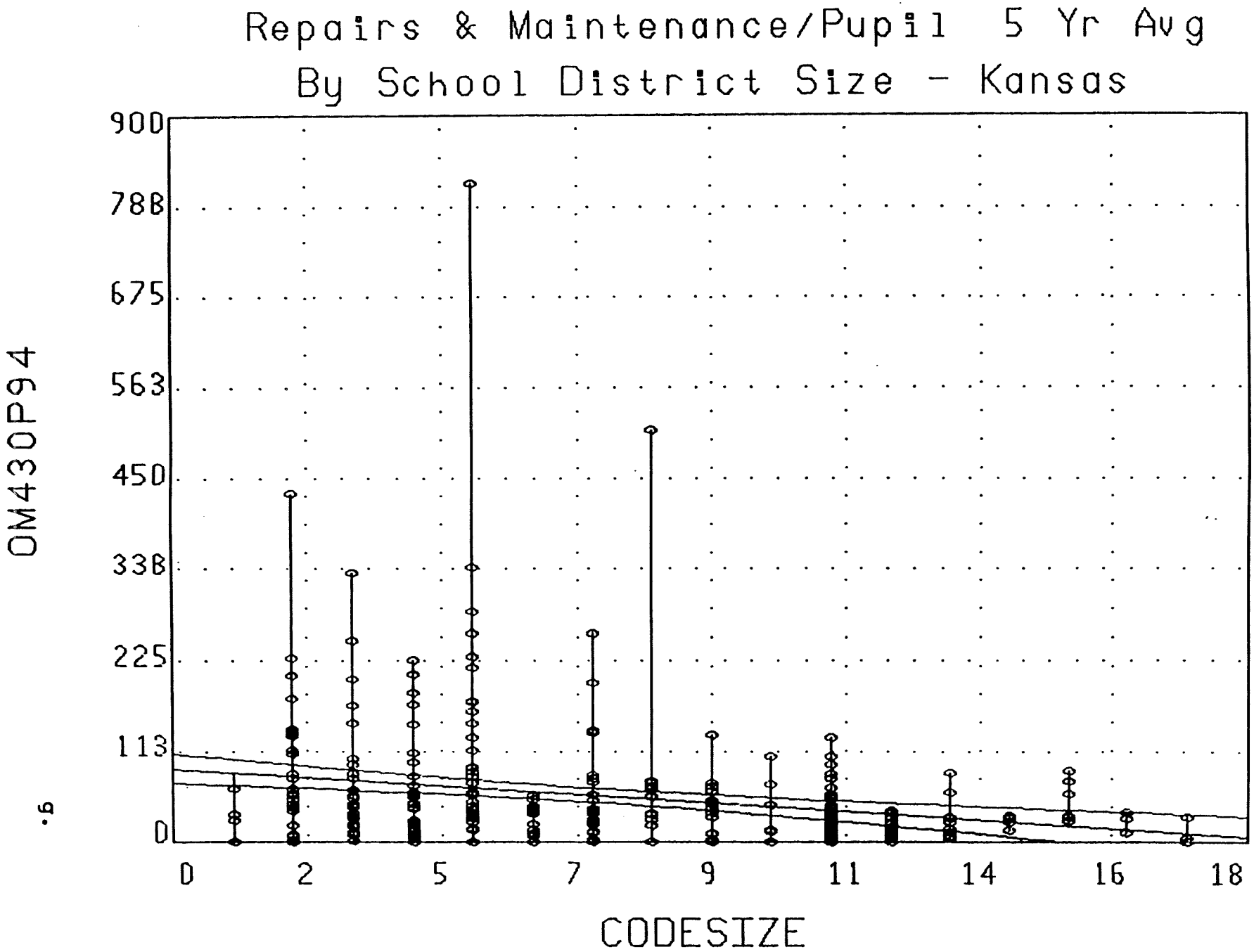
3. From the quantitative analysis of this study, the data have indicated that non-salary related expenditures are not a function of school district size. Therefore, only salary related expenditures should be allocated through the present low enrollment weighting formula. The remaining amount of low enrollment weighting funds should be allocated in equal per pupil amounts to all school districts in the state.


Normal Probability Plot
School District Size FTEE ENR 5 Yr
3000.0
2250.0
1500.0
750.0
0.0
Fte5yr
3.00
-1.50
0.00
1.50
3.00
Quantiles

a.


Normal Probability Plot
Assessed Valuation/Pupil 5 YR AVG
300000.
225000.
150000.
75000.0
0.0
Av p5yr
3.00
-1.50
0.00
1.50
3.00
Quantiles


Repair of Buildings/Pupil (5 Yr Avg)
By School District Size - Kansas
OM460P94
1200
1050
900
750
600
450
300
150
0
0
2
5
7
9
11
14
16
18
CODESIZE


Repairs & Maintenance/Pupil 5 Yr Avg
By School District Size - Kansas
OM430P94
900
788
675
563
450
338
225
113
0
0
2
5
7
9
11
14
16
18
CODESIZE

3-16

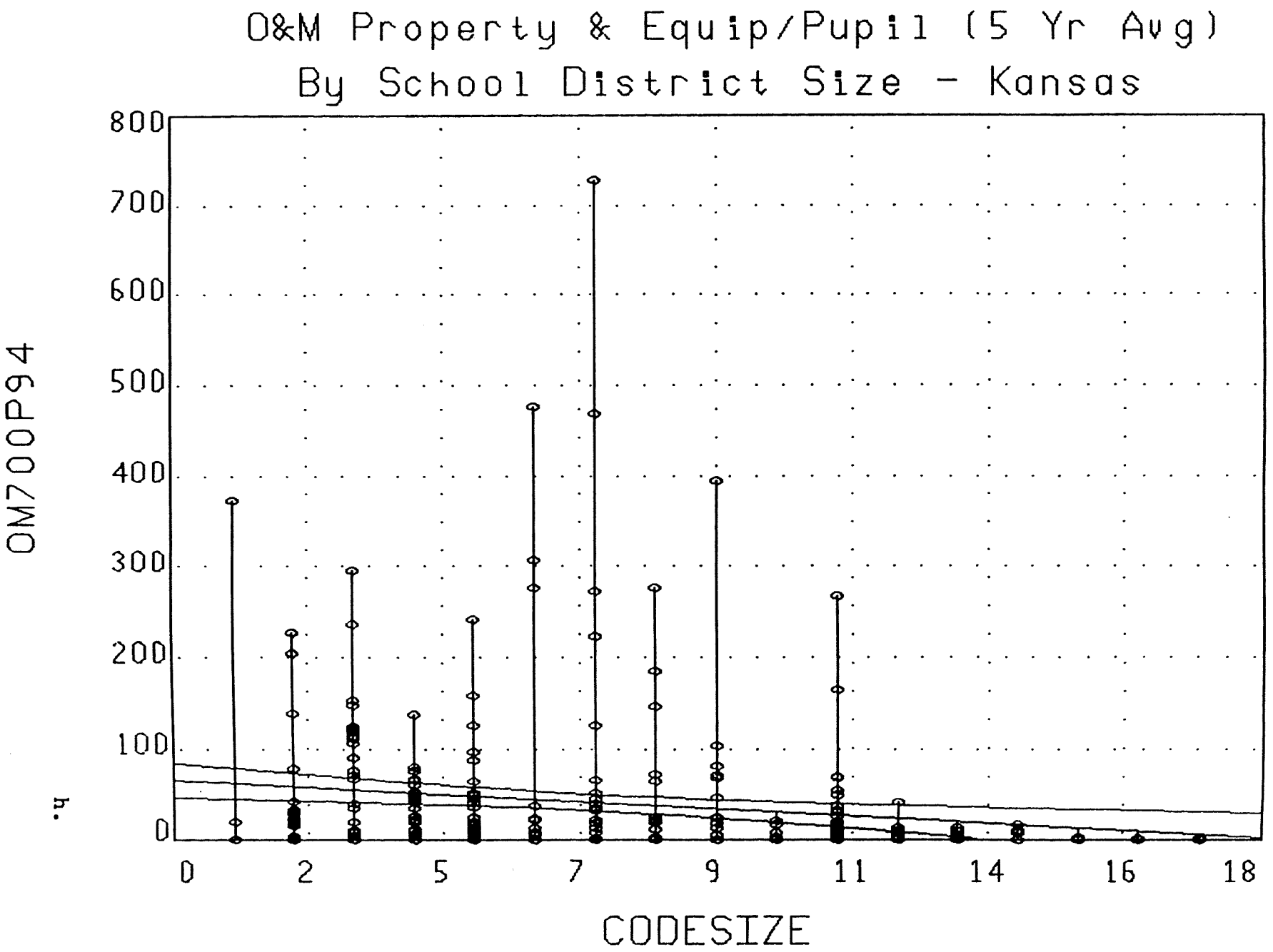

O&M Property & Equip/Pupil (5 Yr Avg)
By School District Size - Kansas
OM700P94
800
700
600
500
400
300
200
100
0
0
2
5
7
9
11
14
16
18
CODESIZE

Table 8
OPERATIONS & MAINTENANCE
1989-90 TO 1992-93
Percentage of School Districts With O&M Expenditure by Category

CATEGORY	120	210	220	290	300	411	420	430
School Districts								
89-90 % WITH	100%	49%	79%	59%	37%	94%	33%	70%
90-91 % WITH	100%	63%	93%	77%	39%	96%	58%	86%
91-92 % WITH	100%	67%	96%	79%	39%	96%	61%	87%
92-93 % WITH	100%	69%	96%	79%	41%	96%	62%	88%
93-94 % WITH	100%	70%	97%	82%	44%	97%	62%	89%
89-94 % 5YR	100%	64%	92%	75%	40%	96%	55%	84%

CATEGORY	440	460	490	520	590	610	621	622
School Districts								
89-90 % WITH	25%	53%	44%	64%	34%	88%	99%	99%
90-91 % WITH	35%	60%	48%	71%	47%	95%	99%	99%
91-92 % WITH	38%	59%	44%	72%	48%	96%	99%	99%
92-93 % WITH	36%	63%	44%	71%	46%	97%	99%	99%
93-94 % WITH	36%	63%	48%	71%	48%	98%	99%	99%
89-94 % 5YR AVG WITH	34%	60%	46%	70%	45%	95%	99%	99%

CATEGORY	626	629	680	700	800
School Districts					
89-90 % WITH	22%	31%	29%	57%	34%
90-91 % WITH	39%	33%	31%	68%	48%
91-92 % WITH	43%	29%	30%	68%	46%
92-93 % WITH	46%	30%	25%	74%	48%
93-94 % WITH	46%	28%	29%	75%	46%
89-94 % 5YR AVG WITH	39%	30%	29%	68%	44%

Data Source: 1989-90 to 1993-94 Data, Kansas State Board of Education

Table 9
Operations and Maintenance (O&M)
Average O&M Expenditure per Pupil
1989-90 & 1993-94
By Category

Category OPERATIONS & MAINTENANCE	89-90 $ Per Pupil	Range $ Per Pupil	# Sch Dists	93-94 $ Per Pupil	Range $ Per Pupil	# Sch Dists
120 Non-Certified Salary	*$224	$80 -$649	303	*$249	$64 -$507	304
622 Electricity	78	25 - 274	299	90	20 - 330	301
621 Heating	39	6 - 213	300	43	7 - 252	302
430 Repairs & Maint	27	.1 - 207	211	37	.6 - 817	272
460 Repair of Buildings	27	2 - 632	167	42	2 -1103	193
610 General Supplies	27	6 - 179	268	34	8 - 239	298
520 Insurance	22	.7 - 236	194	20	3 - 151	216
700 Property (Equipment/	21	4 - 419	172	22	5 - 807	227
220 Social Security	* 18	2 - 299	239	* 20	5 - 405	295
629 Other (Energy)	18	5 - 185	93	8	2 - 81	84
210 Insurance (Employee)	* 15	.2 - 168	149	* 16	3 - 119	213
490 Other (Pur Prop Svc)	14	9 - 119	133	12	2 - 474	146
800 Other (Property Svc)	14	8 - 160	103	18	3 - 583	140
300 Prof Technical Svc	11	.1 - 175	113	17	3 - 301	134
440 Rentals	11	1 - 227	76	17	3 - 886	112
411 Water/Sewer	9	.6 - 55	286	11	2 - 50	295
290 Other (Emp Benefits)	* 7	3 - 86	180	* 6	5 - 45	250
590 Other (Purchased Svc	7	4 - 46	102	10	7 - 130	146
680 Miscellaneous Suppli	7	6 - 105	87	5	9 - 112	87
420 Cleaning	4	.3 - 69	99	7	10 - 53	189
626 Motor-Fuel (Not Bus)	3	.1 - 33	66	3	3 - 161	140
Total O & M /Pupil Mean	$499	$211 -$1,350		$609	$250 - $1,673	
Expend & Transfers/Pupil	$3,695	$2,350 -$8,393		$4,673	$3,724 -$10,471	
Enrollment FTEE	407,882	72 - 43,942		437,208	74 - 45,357	

* Salary Related Operations & Maintenance Data
Data Source: 1989-90 & 1993-94 Data, Kansas State Board of Education

Table 27-A
High and Low Expenditure School Districts on
15 Operations & Maintenance Categories
Costs Per Pupil by Category
Five Year Average

15 O&M CATEGORIES TOTAL	430	440	460	610	700	93-94 FTEE	# PUPILS PER ATT/CNT
$710	$31	$338	$125	$36	$ 28	246	123
$664	26	515	14	52	21	707	236
$646	11	3	347	64	153	565	282
$596	81	17	157	81	180	293	146
$523	13	206	73	62	82	822	164
$89	0	0	0	21	2	849	212
$85	0	0	0	10	3	21,002	429
$57	6	1	1	18	2	30,537	536
$54	7	0	0	23	8	1,205	151
$25	7	0	0	7	0	1,918	480

430 = Repairs & Maintenance
440 = Rentals
460 = Repair of Building
610 = General Supplies
700 = Equipment & Furniture

Low Enrollment Weighting in Kansas School Districts

Summary of the Qualitative Study

Gerald R. Bass
Oklahoma State University

Data Gathering

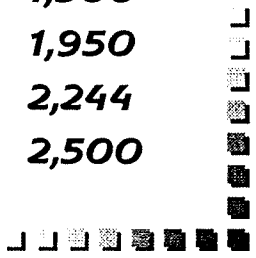
1. Review of the literature
   - Challenges to small schools & districts
   - Definitions of "small" schools
   - Funding for small schools & districts
2. Review of legislation
   - Size criteria
   - Other criteria
3. Interviews with superintendents

Challenges to small districts

- High per-pupil costs
  - Low pupil-teacher ratios
  - Low base for allocating fixed costs
- "Diseconomy" of scale
- Curriculum/program offerings
- Staffing

How small is "small"?

White & Tweeten (OK)	675
Natl. Comm. on Reorg.	975
Washington Levy Comm.	1,000
Conant	1,300 +
Cohn (IA)	1,500
Mort	1,950
Osburn	2,244
Chambers et al. (MO)	2,500

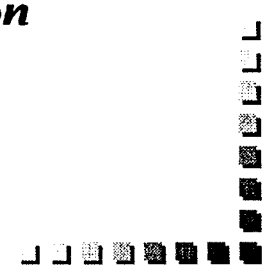


Policy bases for the funding of small districts

- **Neutrality**
  - No special treatment
- **Intolerance**
  - Forced reorganization
- **Funding of all**
  - By size criterion
- **Funding of some**
  - By size and isolation criteria

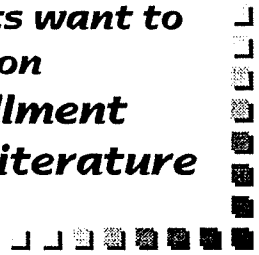
Isolation criteria

- Density of population
- Distance (or travel time)
- State Determination (multiple criteria)



Interview findings

- Few responses to request for suggested size criterion
- Positions depend on perspective
  - Those in larger districts want smaller criterion
  - Those in smaller districts want to maintain current criterion
- Rationale for low enrollment funding similar to the literature



Recommendations

- Change terminology from "low enrollment" to "district size"
- Ensure "hold-harmless" changes, should change be considered
- Consider greater local contribution by non-isolated low enrollment districts