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Memorandum

To: Steve Klein, Legislative Joint Fiscal Office
From: Nic Rockler and Tom Kavet
CC: Mark Perrault, Catherine Benham
Date: July 12, 2007
Re: Education Cost Analysis – Phase 2 Update

BACKGROUND AND RESEARCH OVERVIEW

Since the State Education Fund and Statewide property tax was implemented as a part of Act 60 in 1998, there has been an expanded Statewide responsibility to public education financing. This responsibility includes the setting of Statewide property tax rates, the dedication of other State revenue sources to the Education Fund and other revenue generation measures necessary to finance education expenditures. Public K-12 education is by far the largest single State expenditure item, now accounting for about half of all State appropriations.

Despite this revenue financing responsibility, there has not been a corresponding Statewide authority for controlling and managing education costs. While voters hold State government officials responsible for property and other tax increases necessary to meet public education expenditures, these expenditures are largely the result of dispersed local budgetary decisions. With public education expenditures per student rising at rates well above those for general inflation and even growth in the economy at large, and mounting concern over growing property tax burdens, there is an increasingly urgent need for oversight, engagement and enhanced understanding of education expenditures at the State level.

At the request of several legislative committees, we have been working with the Department of Education and other relevant parties in assembling, “cleaning” and analyzing relevant statistical information with which to better understand State education cost drivers and report on possible policy implications based on this analysis and data. This work is intended to extend and further prior Phase 1 State-level analysis performed for the Vermont Business Roundtable and the Joint Fiscal Office in 2006 and early 2007 (see attached memo, Appendix A).

This second phase of research focused on extending the prior aggregate analysis to more detailed levels, as listed below, so as to identify and better understand the sources of recent cost increases and possible policy options:

- *Further data analysis by geographic region (Supervisory Union, District, and School, if possible)*
- *Further data analysis by organizational unit size (including number of pupils, physical-geographic size and number of administrative sub-units, such as LEAs) for Supervisory Union, District and School size classes*
- *Further data analysis by detailed expense category*
- *Consultation with Department of Education and other management staff regarding data quality, accounting and related issues (business managers, superintendents, administrators, etc.)*
- *Greater analytic depth, based on the above statistical information, and a focus on per pupil expenditures*
- *Identification of data and management information needs, and possible policy options and goals*

This analysis was designed to review extant data and develop or recommend development of needed data and further analysis in order to answer the following questions:

- *What are the most significant cost drivers affecting public education in Vermont?*
- *Are there ways we can increase the efficiency and effectiveness of the public educational services we deliver?*
- *Are we “getting our money’s worth” for our relatively high state and local education expenditures?*
- *Why are staffing levels increasing as enrollments decline? Will this continue?*
- *Are there structural conditions that affect expenditure management and control?*

While this second phase of research has furthered our understanding of many expenditure issues, it leaves most of the above questions still unanswered in whole or part. Specific further research, in addition to measures recently passed as a part of H.526, are recommended below to advance the level of analysis necessary to meaningfully address these issues.

SOURCE DATA CHARACTERISTICS AND LIMITATIONS

Most of the analytic work to date has involved identifying, assembling and “cleaning” statistical data from the Department of Education with which to base this work (i.e., making data consistent across regions, categories and time, correcting for collection anomalies, accounting conventions, etc.). The importance of this process cannot be overstated, since all conclusions drawn from this analysis are only as good as the data upon which they are based.

There are a number of separate databases that we are currently using, organized by expenditures, budgets, enrollments, special education and staffing. Generally, the more detailed the geographic analysis and category detail in any dataset, the more intensive the development and data “cleaning” necessary for unbiased use.

The datasets we have pursued most extensively in this second phase of the analysis include a detailed expenditure database from the Department of Education and various measures of student enrollments. The expenditure data are currently useable to the Supervisory Union level (including Supervisory Districts), hereafter referred to as “SU” or “SU/SD,” and initial analytic runs have been performed at this level of geographic detail. These expenditure data are used in the annual State publication, “Summary of the Annual Statistical Reports of Schools¹.”

Expenditures are categorized according to federally established accounting conventions designed for nationwide use for comparative analysis. For the most part, these are useful when analyzing public education expenditures that involve aggregations of schools to form local school districts and then further to reach a state total. In many states, a single aggregation rule can be applied to all expenditures for any given school and is used to derive district-level spending. From there, aggregation to the state level is generally straightforward.² This accounting scheme is not well suited for use in Vermont, however, where an intervening layer of some expenditures pass through the SUs and SDs that can include administration, operations, instruction, and other resource sharing among schools and districts. The scope and degree of sharing of expenditures at the SU/SD level varies from SU to SU.

An additional complication of having expenditures made at the SU/SD level is that the set of pupils for which some local expenditures are applied varies by expenditure type. Thus, while we know total aggregate expenditures in the State by detailed expenditure categories, the accuracy with which these can be traced back to units like SUs and LEAs diminish as the units approach individual schools.

¹ Produced by the VT Department of Education, see <http://education.vermont.gov/new/html/data/sasrf.html>, also referred to by the acronym, “SASRS.”

² Many states have local education authorities (LEAs) organized by districts that are coincident with counties, with each district operating independent of all others in a state.

Even if the accounting were reliable in allocating expenditures to the various geographical units, there are also statistical problems with respect to combining these expenditure data with enrollment data to analyze per pupil expenditures.

Presently, there are four sets of enrollment data that relate to LEA and SU enrollments. These are: (1) The "October 1" enrollment figures taken on that day for each school, (2) the full-time equivalent (FTE) enrollment figures used in the federal reporting scheme, based on a multi-day measure of enrollment with adjustments to eliminate counting of part-time students to derive a full-time equivalent figure, (3) the average daily membership (ADM) enrollment, which counts enrollment based on place of residence and not on place of schooling, and (4) the equalized pupil counts, in which the average daily membership at each grade level is weighted by the level of instructional effort and expenditure to account for differences in the grade composition of the population when allocating State aid to LEAs. For the analysis presented herein, only the first three are relevant, and we have primarily relied upon the ADM enrollment figure. This dataset appears to be the most comprehensive in matching the LEAs found within the expenditure dataset prepared for our use by the Department of Education.

The ADM data, however, when used in conjunction with these expenditure data have the potential to mis-measure expenditures per pupil when a significant proportion of students being served in a district actually reside outside a district. The ADM data undercount enrollment in the receiving area, but expenditures cover all students served. At the SU/SD level, the inaccuracy becomes noticeable when there is a sizeable student "commuting" pattern across SU/SD boundaries. This is thought to occur most often in the larger urban school districts that receive students from outlying areas.

Ideally, the best data for our purposes would be the October 1 enrollment data, but these were found to have many missing schools and LEAs over the time period analyzed. Whereas the expenditure data have figures for 357 LEAs, the October 1 data have figures for only 274. The FTE data were the next best choice, and in Appendix C, we present a disaggregation of total expenditures based on quintiles using the FTE figures. These show significantly fewer pupils and, accordingly, raise observed expenditures per pupil. They do not, however, cause a marked change in the calculated growth rates for the different quintiles, relative to ADM-based analysis. Furthermore, the ordinal relationship between different sized groups with respect to expenditures per pupil does not change very much between these two enrollment metrics.

Detailed analytic output (tables and charts) from various SU/SD level data are contained in Appendix B. They include analysis based on per pupil expenditures, with various enrollment definitions and size class groupings, including number of pupils, number of LEAs, and physical size in square miles.

While this second phase of the analysis sheds some new light on the above questions, there is significant additional information required to fully respond to these issues and support specific policy recommendations. We believe the most valuable such additional information will derive from comparable analytic effort at the District and School levels, survey-based information with which to explain outliers and test analytic hypotheses, and the development of outcome based metrics at the same level of detail with which to assess the effectiveness of observed expenditure variations.

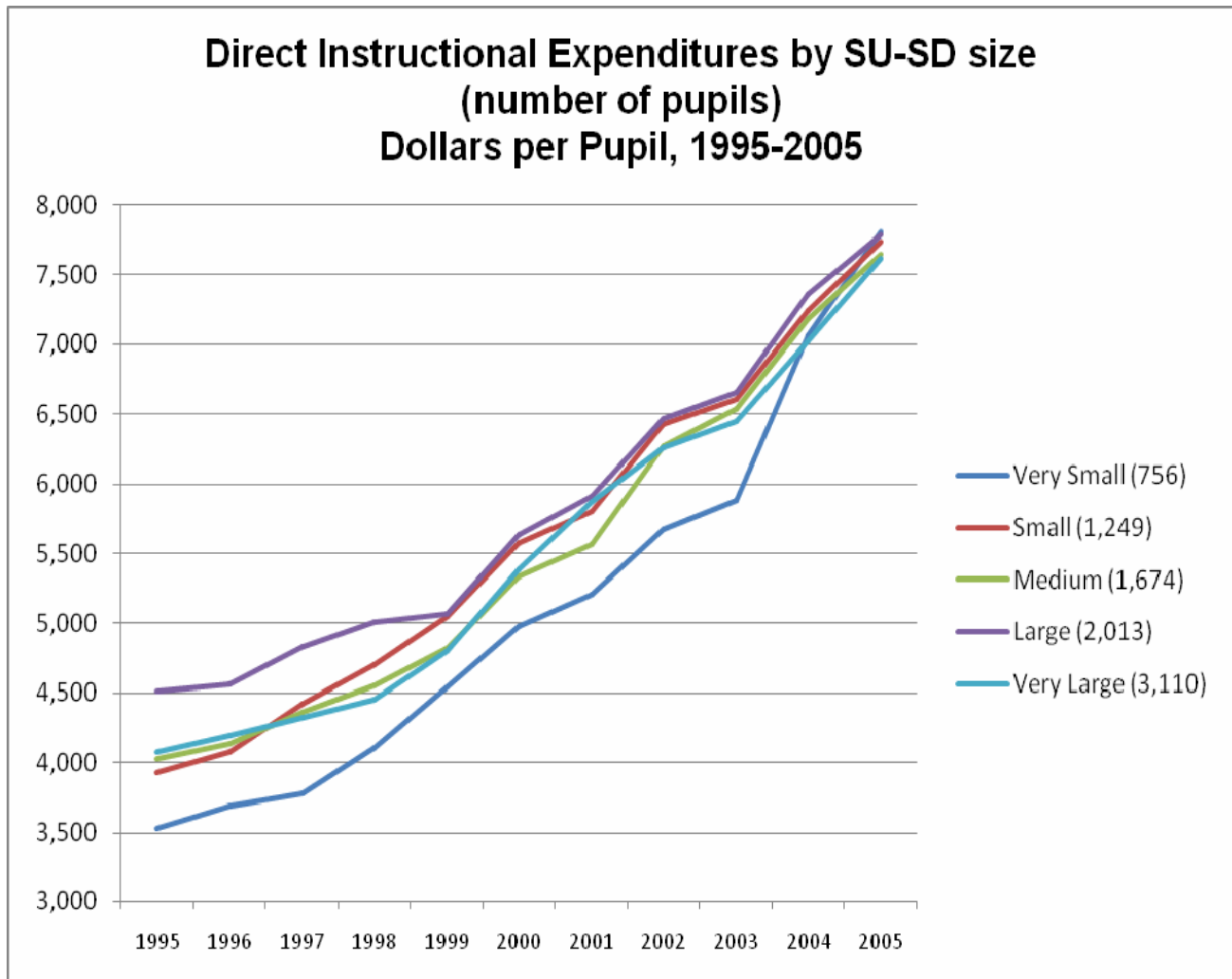
The findings to date and related preliminary recommendations based on this analysis are summarized below. Most recommendations are “preliminary,” because they are contingent upon the development of outcome and performance based measures that should be merged with the analysis to date. For example, a finding of a cost increase differential between one SU and another does not mean one is “better” or “more efficient” than the other without some measure of how well each is performing its core mission to educate the children of our State.

Similarly, the below section on “Further Research” identifies the most significant future research as the construction of comparable District and School level expenditure data, both historical and ongoing, and the combination of regional outcome-based performance data with expenditure data so as to analyze critical relationships between the two.

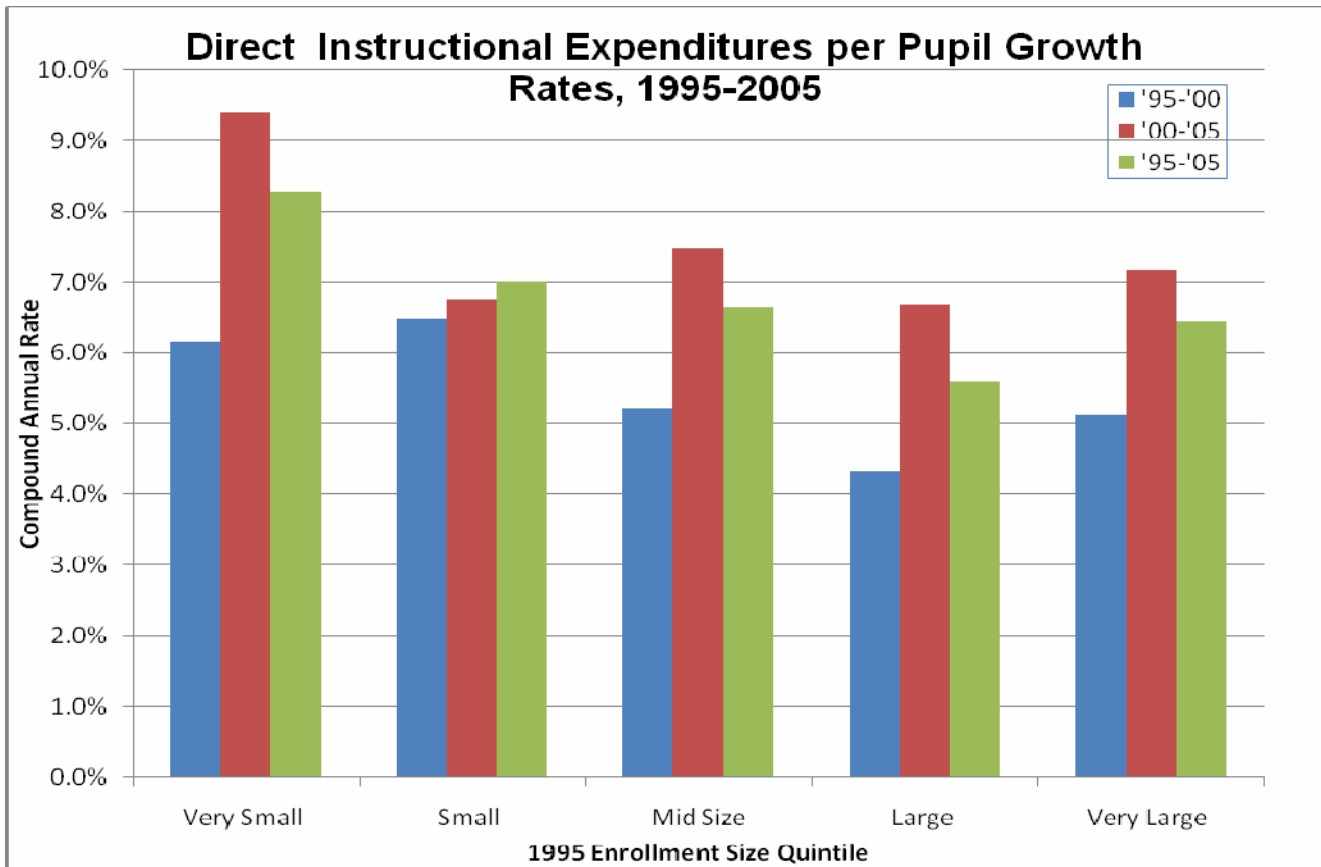
FINDINGS TO DATE

- **FINDING 1: *Consistent, comparable data do not currently exist at the District or School levels with which to analyze basic education expenditure trends and inform broad management and policy decisions.*** *Although aggregate data at the State and Supervisory Union levels allow some comparative analysis, the data at the school and district levels are generally inadequate to generate even basic expenditure metrics that are comparable across Schools or Districts and time periods. As presently constituted, these data are intended to satisfy general federal and state reporting requirements at levels of aggregation that do not entail rigorous consistency with respect to categorization of expenditures or a detailed knowledge of the accounting conventions. For any more centralized management purpose, however, carefully recorded information is essential to fully understanding, evaluating and managing education costs, and developing policies that maximize the return to taxpayers and students from the State’s substantial expenditures in public education. Additional effort and resources are needed to create the requisitedata for effective management of the State’s schools and school districts.*

- **FINDING 2:** *Although instructional expenditures per student have converged since the passage of Acts 60 and 68, there remain substantial differentials in expenditures per student by individual Supervisory Union (see Appendix B, Table 2). Without combining expenditure and performance data at the SU level, the extent to which these expenditure variations may affect student performance is unknown.*



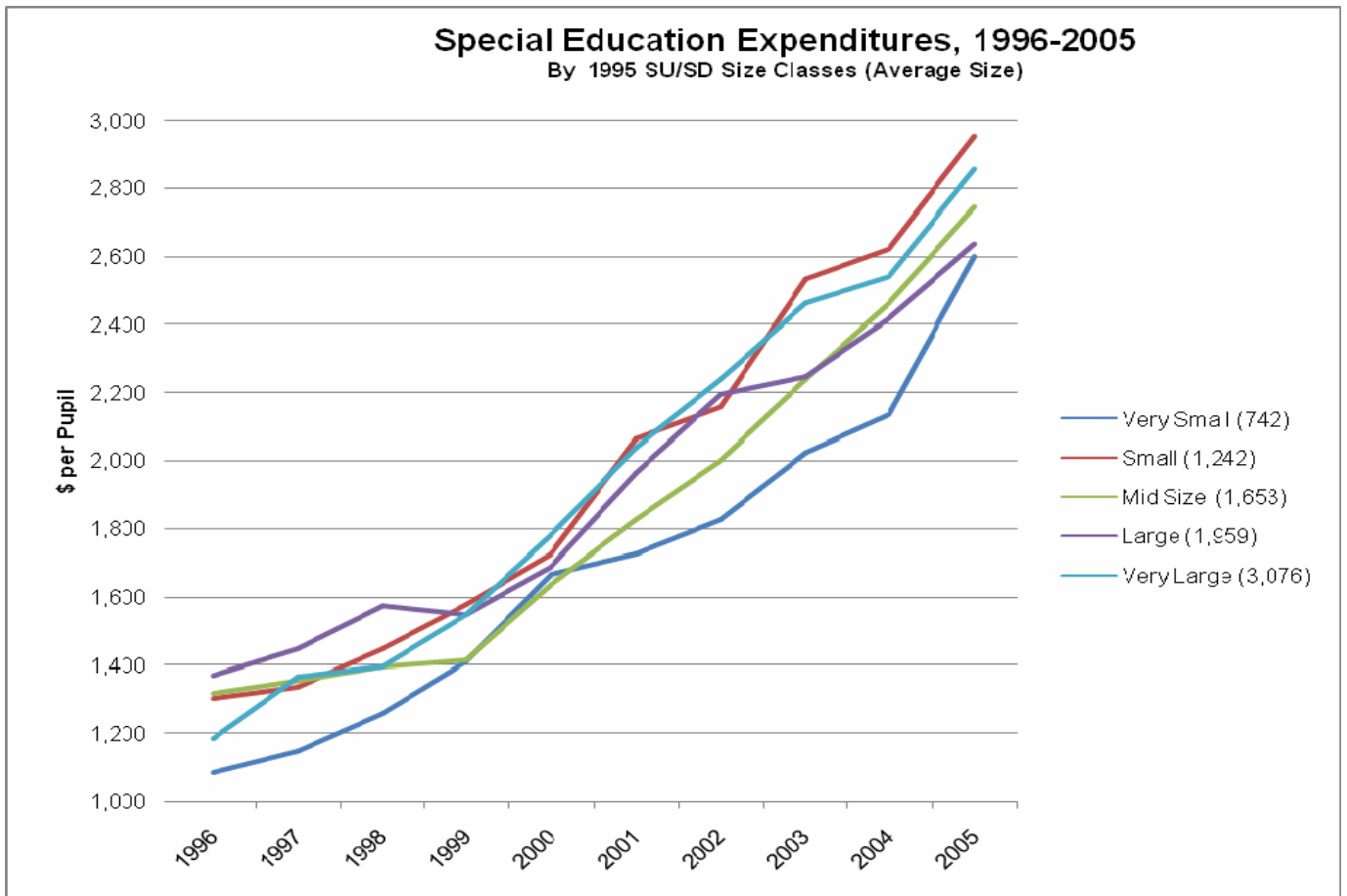
- **FINDING 3:** *This convergence in direct instructional costs per student has resulted in higher recent cost growth rates among the smaller (based on the number of pupils per SU) Supervisory Unions.*



- **FINDING 4:** *There is a growing propensity to outsource services, both instructional and non-instructional, by all SUs/SDs. While the net impact of this trend on overall costs is uncertain, it can obscure “real” growth rates by expenditure category.³*
- **FINDING 5:** *In general, economies of scale in non-instructional expenditures can be gained up to the largest size levels (based on the number of pupils per SU), after which point expenditures rise unexpectedly. At this time, it is not known whether the scope of services grows as SU/SD size increases, (which might explain these types of cost increases), nor whether outcomes, in terms of student performance, improve in tandem with these elevated expenditures.*
- **FINDING 6:** *Salary expenditures per pupil appear to favor relatively smaller SU/SDs. If consolidation of smaller SU/SD into larger ones is anticipated, the effect could be to push salaries and benefits upward, not downward (see Appendix B, Chart 16).*

³ Once services are outsourced, the State no longer knows how provider expenditures are allocated by function or object, i.e., uses of the funds for such things as salaries, benefits, facilities, etc. These are implicit in the fees charged by providers, but the underlying cost driver information detail is lost.

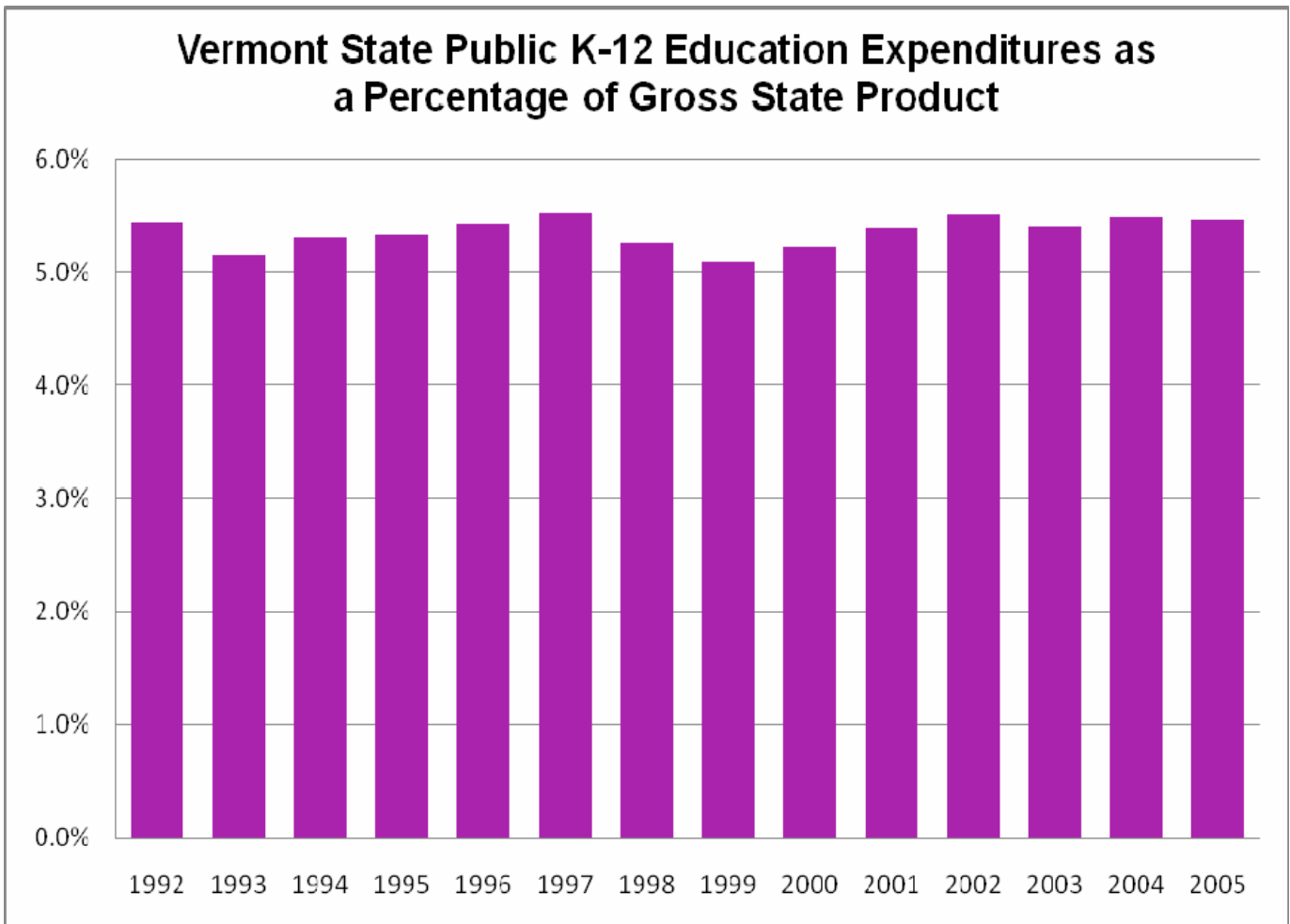
- **FINDING 7:** *Strong rates of growth for tuition expenditures external to an SU/SD are evident, particularly among the ones with the fewest students (see Appendix B, Chart 26).*
- **FINDING 8:** *High rates of growth in special education expenditures (nearly 9% per year over the past ten years) are evident, particularly among the smallest and largest SU/SDs (see Appendix B, Chart 28). Special education is one of the fastest growing expenditures throughout the State. At \$2,827 per pupil in 2005, it exceeds expenditures on personnel benefits and all other types of spending with the exception of personnel salaries.*



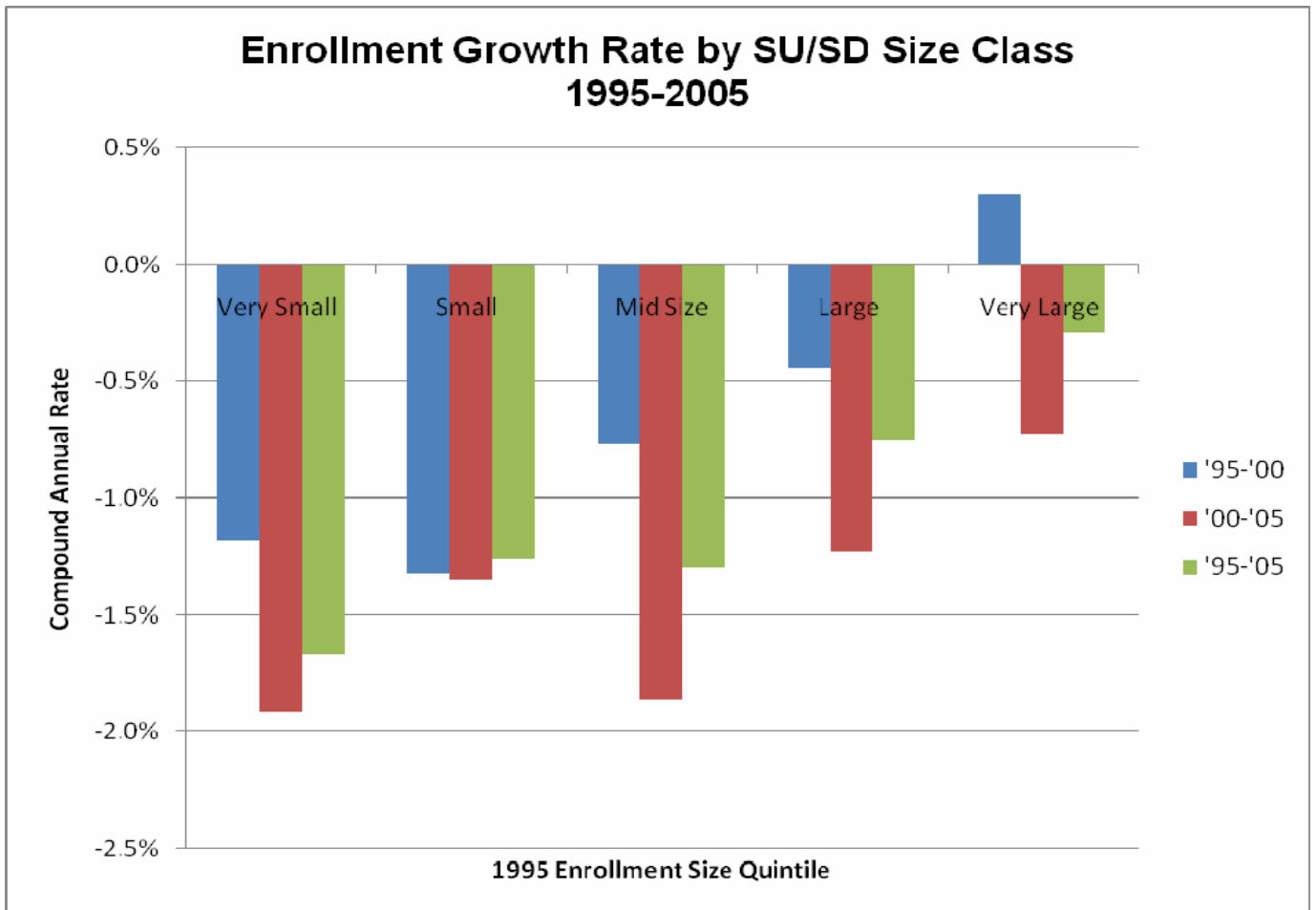
- **FINDING 9:** *The largest education expenditure components are related to personnel staffing, with more than two-thirds of all expenditures going to salaries and benefits. Since 1996, staffing has increased by more than 22%, although since FY2003 has been virtually unchanged. With enrollments declining, the ratio of students to staff has dropped from about 7 to 1 in 1996 to about 5 to 1 in 2006. Much of the increase in staffing has been associated with*

rapidly expanding special education services. The percentage of students identified with special education needs in the student population has been increasing, along with parental advocacy and other groups pressing for additional special education funding.

- **FINDING 10:** *Over the past 10 years (1995 to 2005), total education expenditures (+5.7%) have been rising at rates that are significantly above general inflation rates as measured by the State and Local Government Deflator (+3.3%), the Consumer Price Index (+2.5%), and even overall growth in the economy as measured by the Gross State Product (GSP, +5.4%). State public K-12 education expenditures as a share of GSP are currently about 5.5%, only slightly higher than the recent 14 year average of 5.4% (see below chart). Thus while the share of GSP devoted to K-12 education has remained relatively constant, enrollments have declined by about 10%. This has caused average annual expenditures per pupil over this same period (+6.4%) to rise about 1 percentage point faster than GSP growth, and nearly double the State and Local Government Deflator (+3.3%), a trend that is likely to continue without policy intervention.*



- **FINDING 11:** *Benefit costs, especially healthcare, have been rising rapidly and now represent more than 22% of all personnel costs. These costs are likely to continue to escalate at rates exceeding general rates of inflation. It should be noted that these costs exclude some expenses associated with post-retirement benefits, including any current under-funding of the State-managed teachers' pension fund and State funding of the teachers' pension fund.*
- **FINDING 12:** *There is no central State entity charged with or empowered with responsibility for managing, analyzing and controlling aggregate public K-12 education expenditures.*
- **FINDING 13:** *Enrollments have declined by nearly 10,000 students since 1997 and will continue to decline through about 2013. At no time over the next 20 years are enrollments expected to exceed current levels. Per the below chart, the steepest declines in enrollments have generally occurred among the smaller SU/SDs, accentuating the challenge of absorbing such declines without increasing per pupil costs.*



- **FINDING 14:** *When examining the expenditure data by the number of administrative units (i.e., LEAs) that are contained within SUs/SDs,⁴ SUs and SDs, viewed separately from one another, had nearly identical expenditures per pupil from 1995 to 2000. SDs began to show lower costs than SUs from 2000-2005 and now average \$1,200 per pupil less than SUs. One reason for this is that SUs are losing enrollments at a faster rate than SDs, consistent with the notion that the State is becoming more urban, i.e., more concentrated in city areas where SDs are found. These organizational units appear to operate more efficiently (see Appendix B-Table 13 and Chart 30).*

- **FINDING 15:** *Single LEA-SU/SDs have the lowest expenditure rates per pupils and those with 6-7 LEAs within an SU, the highest. The difference between lowest and highest is growing significantly. It was about \$1,500 per pupil in 1995 and is now \$4,000 in 2005. The lowest costs per pupil are found among the two groups of SUs with the fewest LEAs (i.e., 1 and 2-3), followed by 10 or more. The "middle-ground" is least efficient in this case. This finding strengthens the case for some consolidation, not over SUs, but of LEAs within SUs (see Table 15, and Chart 32).*

- **FINDING 16:** *When examining SU/SDs by physical-geographic size, low enrollment densities (i.e., large physical-geographic areas) might be expected to be related to higher costs, but in general this is not the case (see Appendix Table 14 and Chart 31).*

- **FINDING 17:** *Instruction and support services expenditures vary little for SUs of different geographic size, and exhibit fairly uniform growth rates (see Appendix Tables 16 and 18, Charts 33 and 35).*

- **FINDING 18:** *Noninstructional services and "other" expenditures evidence the widest range of expenditures per pupil, with the lowest per pupil rates found in areas of low to moderate size, but not always consistently when viewed over 10 years (see Appendix Tables 18 and 21 and Charts 36 and 37).*

- **FINDING 19:** *For the direct instruction and support services expenditures, the smallest –sized SUs have the lowest per pupil expenditures. This is consistent with the lower cost structures observed earlier for the SDs, in which the higher density urban areas also had the lowest per pupil costs. Consolidating SUs in rural areas by*

⁴ 9 of the SDs consist of a single LEA. 4 SDs are comprised of 2 LEAs.

itself would appear to raise per student expenditures, while consolidating LEAs within these SUs might lower per pupil costs. In the end, little may be gained through such a move, as the effects could be offsetting. There may be other reasons to promote various levels of consolidation, but these would require examining performance outcomes.

- **FINDING 20:** *Expenditures on facilities, including land acquisition and construction-related items, are generally small on a per pupil basis, but are also volatile over time. (See Appendix B, Charts 12 and 13.) A single large school construction project can distort per-student expenditure levels and growth rates, even at the SU/SD level. When these expenditures are included in current account outlays at the LEA and SU/SD level, it is important to examine overall expenditures exclusive of such non-recurring items.*

- **FINDING 21:** *Federal and state mandates, regulations and other statutory requirements (often unfunded or under-funded) have irrefutably contributed to the rising cost of public K-12 education. Although few of these costs have been quantified to date, cursory and other evidence suggests they could be substantial in aggregate.*

PRELIMINARY RECOMMENDATIONS TO DATE

- **RECOMMENDATION 1:** *Basic financial management and accounting conventions should be specified and instituted by the State at the Supervisory Union, District and School levels so as to insure comparable and consistent data with which to make management and policy decisions. Training and/or certification of public K-12 education business managers in these conventions should be required in order to insure adherence to these standards.*

- **RECOMMENDATION 2:** *To the extent possible, historical District and School level data should be “cleaned”, supplemented with survey and other remedial data collection, if needed, and normalized so as to allow critical comparative statistical expenditure and performance measures and analysis across Districts, Schools and time periods. In the event that neither data nor resources permit a rigorous audit to deal with issues of allocated expenditures at the SU/SD level to individual LEAs and schools, we recommend statistical and other database methodologies to accomplish this based on enrollment and other allocation proxies so as to allow meaningful analysis of basic trends and expenditure characteristics.*

- **RECOMMENDATION 3:** *It is essential to extend and further develop comprehensive educational performance data, ideally at the individual student level. Without outcome-based data organized by School, District and/or Supervisory Union, it is impossible to discern whether or not Vermont's relatively high staff to student ratios are beneficial and/or if there are meaningful relationships between expenditure differentials and outcomes. The development of meaningful and timely outcome-based data that may be organized by Supervisory Union, District and School is critical. Organizing this dataset at the individual student level would allow tracking of relative achievement growth (vs. absolute levels of achievement), adjustment for student mobility by school/district, and better specification of socio-economic factors that are likely to affect performance.*
- **RECOMMENDATION 4:** *Efficiencies in the delivery of education services, particularly in high growth categories such as special education services, should be studied in greater depth, including the use of volunteer and other support personnel options, consistent with legal requirements. Enhanced integration of medical, family and other resources may be necessary to supplement educational resources devoted to special population groups.*
- **RECOMMENDATION 5:** *Measures to minimize health care cost increases should be explored at the largest possible group level, including combinations with other public employees, so as to take full advantage of any possible large group purchasing power.*
- **RECOMMENDATION 6:** *Although the State share of Gross State Product devoted to public education has not changed dramatically over the past 10 years, with enrollments declining, there should be an opportunity for either significant cost reductions or significant quality improvements. Further analysis should be pursued to identify specific opportunities for both.*
- **RECOMMENDATION 7:** *The cost savings potential of consolidating educational purchases and contracting across the entire State, where possible, should be reviewed and considered as a potential efficiency measure.*
- **RECOMMENDATION 8:** *The costs of existing and proposed federal and state mandates that impact education costs should be estimated so as to be able to quantify the likely costs of such measures – ideally prior to passage.*
- **RECOMMENDATION 9:** *The Department of Education or other public entity should be charged with analyzing, managing and making*

recommendations to the legislature and Governor that specify ways the public education system may be able to deliver the same or superior educational services at the lowest possible cost to taxpayers. Any funding necessary to accomplish this management goal is likely to be exceeded by net savings achieved through implemented efficiencies or quality improvements.

FURTHER RESEARCH

Although significant additional research has been specified through recently enacted legislation (H.526), there are two important areas of further research not specifically mandated. They are:

1) The development of meaningful historical and ongoing expenditure per pupil data at the operational levels that are most relevant, Districts and Schools, and

2) The development of credible performance and outcome metrics, ideally based on individual student data, with linkages to School, District and SU, so as to allow analysis of costs versus benefits.

Although the former research goal would require substantial data “cleaning,” the development of reasonable expenditure allocation algorithms, and some survey-based data, we believe it is essential to fully understanding State education expenditures and would be well worth the effort. It would also support and enhance recently enacted statutory directives (via H.526) focused at the District level.

The latter research goal is more complex, but equally critical. Without some way to objectively measure what we are getting for our public education expenditures, it is impossible to evaluate costs relative to benefits and identify opportunities for improving the ways we educate the children of our State, and finance this vital public service.

SUMMARY

As the largest single State government expenditure item, there is still significantly more detail and analytic depth required in order to fully understand all of the factors affecting past and likely future expenditure growth, and draw conclusions about possible policy options that may be associated with any such analysis.

While we have developed some of the core data necessary to analyze State public education expenditures and raised some important questions, further data and information systems development are necessary, as well as further work with State Department of Education personnel and local education administrators, teachers, and others intimately involved with educating our children in order to address these issues more fully. Given the magnitude and importance of this State expenditure category, we believe such analysis could yield significant public benefits.

There are also systemic issues that have arisen as a result of the changes in education financing that have occurred over the past ten years that state government may need to address if elected state officials hope to fully understand and constructively influence public education expenditures and outcomes. With responsibility for generating revenues to support public education now lodged at the state level, voters are increasingly looking to state officials to assume comparable responsibility for understanding and managing costs. Without systemic changes in the way education expenditures are now managed, however, this may be difficult if not impossible to achieve.