# Resources and Costs Panel

# Report To the

# Quality Education Commission

## April 20, 2000

Resources and Costs Panel Members:

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| Duncan Wyse, Chair | Oregon Business Council |
| Terry Cavanagh | Oregon Public Employees' Union |
| Stephen Greer | Greer & Assoc. CPAs |
| Kathy Krouse | Three Rivers School District |
| Ted Kulongoski | Oregon Supreme Court |
| Jerry Meyer | Tektronix, Inc. |
| Jim Sager | Oregon Education Association |
| Jim Scherzinger | Portland Public Schools |
| Al Shannon | Oregon Assoc. of School Business Officials |
| Chuck Swank | Grove, Mueller, Hall & Swank, CPAs |
| Ken Thrasher | Fred Meyer Corporation |
| Diane Van Blaricom | Rainier School District |

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# I. Introduction

The charge of the Resources and Cost Panel is to evaluate the accuracy of the Quality Education Model and to make recommendations for improving the Model as a tool for estimating the costs of various education program levels and school configurations.

Specifically, the task of the Panel is to recommend ways to accomplish the following:

- Improve the accuracy and utility of the Quality Education Model
- Enhance the Model's ability to estimate the statewide cost of a variety of school programs & program levels and the school-level impacts of changes in state funding
- Improve the model as a tool to support policy decisions regarding state school funding
- Improve the Model's ability to tie funding levels to student performance

With these enhancements, the model will be an effective tool for estimating the costs of providing various program levels and school configurations based on recommendations from the other panels and the Commission. The model also will allow the identification of important tradeoffs in the costs of funding education in Oregon.

# II. Executive Summary

The Quality Education Model is both a vision of what high-performance schools in Oregon might look like and a tool for evaluating the costs of funding those schools. When these two functions are brought together, the model represents an effective tool for estimating the statewide level of funding required to operate Oregon's schools at the level of performance specified in the model. It is the second aspect of the model—as a policy tool for evaluating funding levels and the tradeoffs involved—that is the focus of the Resources and Costs Panel.

The Panel has examined the Model in detail, including the appropriateness of each cost component, sources of cost information, methods of estimation, and assumptions behind the cost estimates. The Panel also has made recommendations for improvements and identified policy issues to be addressed in the future.

### *Key Findings*

<u>The Quality Education Model can estimate statewide school costs with reasonable accuracy.</u>
The Panel found that the Quality Education Model, based on the prototype schools approach, provides a reliable method for estimating education costs at a statewide level. The Model represents a policy tool that can be used to evaluate the funding impacts of specific policy proposals. By putting costs on each component of the prototype schools, the Model will enable policymakers to identify and evaluate important tradeoffs in the costs of providing educational services to Oregon's children.

<u>The cost elements and components of the prototype schools are appropriate and reflect the inputs used in actual Oregon schools.</u>
The Panel reviewed the cost elements and components of the prototype schools, compared the prototypes with actual Oregon schools, and identified minor omissions and revisions. The Model accurately reflects the categories of activities and spending in actual Oregon schools. The structure of the Model also provides flexibility to accommodate changes in programs or school configurations through adding, deleting, or modifying components. Because of the flexibility in the current model structure, the Panel does not think that additional prototype schools need to be added to the model.

The data used to estimate costs are of relatively high quality and should continue to improve over time.
In general, the data required by the model is available and of good quality. The Panel paid particular attention to estimates for the costs of employee compensation since school districts spend the majority of their budgets on staffing. The salary and benefits data available from the Department of Education and other state education organizations are of relatively high quality. Data quality in general should improve over time as all districts in the state are included in the Database Initiative and have more time to fully implement the uniform chart of accounts.

The methods used to estimate the prices of model inputs are appropriate.
For most components of the prototypes, the model uses statewide average costs calculated from data on actual Oregon schools as the input prices. Because most school inputs are purchased in relatively competitive markets, average costs from actual Oregon schools should represent accurate estimates of the prices of inputs specified in the prototype schools.

## *Panel Recommendations for QEM Improvements*

Concentrate on increasing the accuracy of salary and benefits estimates.
For the largest cost component in the prototype schools—teacher salaries and benefits—the Panel spent considerable effort in verifying the accuracy of the available data and in developing an estimation and forecasting model that can provide accurate estimates of current and future teacher costs. The Department of Education should continue to work on improving the accuracy of the salary and benefits data and on understanding the factors that influence changes in salaries and benefits over time.

Make adjustments to improve the precision of the Model.
Panel members identified several areas for improvement in reviewing costing methods, components, and calculations. Specifically:

1) The original model did not include funding to provide licensed substitutes in the classroom if teachers are absent. The Model should include funding for substitutes calculated using the state minimum daily substitute rate and spending data from the Database Initiative.

2) Currently the model estimates the costs of employee benefits by multiplying each employee's base salary by a benefits rate. But because the cost of the most expensive benefit—health insurance—does not vary proportionally with salaries, the model should estimate health insurance costs directly based on actual health insurance cost data.

3) The panel recommends an increase in operating maintenance costs to more closely reflect the full costs of adequate maintenance. There should be a corresponding change in the assumed age of the prototype schools from 35 to 40 years based on additional data recently gathered from districts. The model should continue to exclude costs of deferred maintenance and major capital improvements.

4) The Model appears to accurately reflect the current spending for special education services. It will be necessary to continue to study extraordinary costs experienced by some schools, such as high cost services to special education students and high costs per student in small and remote schools.

Include the costs of services provided by Education Service Districts in the prototype schools.
Services provided to school districts by Education Service Districts were excluded from the original model because: 1) ESD funding has not been equalized across the state, so per-student funding varies

widely among ESDs; and, 2) most ESDs have not accounted for costs of services provided to each school district. The panel recommends that ESD services be incorporated into the prototype schools once the roles of ESDs are better defined and funding has been equalized. The panel did not reach consensus on the timing for adding ESD services to the model, either for the 2001-03 budget cycle or 2003-05. When added, the services can be allocated as central costs within the prototype schools in categories such as: special education services, curriculum and instruction, assessment, staff development, technology services, and ESD overhead.

Keep the Model understandable and easy to use as it is enhanced.
One of the strengths of the Quality Education Model is that it is relatively easy to understand and can clearly demonstrate the impact of changes in state funding levels on school programs. As the model evolves, it will be important to avoid complexity. The Model would be enhanced with clearer explanations and better documentation of data sources and assumptions. In addition, with some minor adjustments the model can be made easier to use by policymakers who want to estimate the funding impacts of changes to the model's assumptions.

## *Policy Issues Beyond the Scope of the Panel's Charge*

As the Resources and Costs Panel carried out its work, the group identified critical issues that state policymakers will need to address if the Quality Education Model is to be implemented as an effective policy tool. A number of those issues are outside the scope of the Panel's charge. Specifically, the Panel regards the distribution of funds to school districts and the governance structure of the education system to be critical issues that the larger Commission must consider. But because they are outside the scope of the Resources and Costs Panel's charge, we touch on them only briefly here.

Distribution of Funds to Districts
Some of the most critical issues facing policy makers relate to the distribution of education resources among school districts. Since the *Serrano v. Priest* decision in California in 1971, the focus of the distribution debate has been on equity, with equity in nearly all cases defined as equal per-pupil revenue across districts. More recently, however, the debate has shifted toward one of resource *adequacy*, with adequacy defined in terms of the resources required to reach a given level of student outcomes. With this shift in emphasis from the inputs to the outputs of the education system, and the recognition that students with differing characteristics require different levels of resources to reach established educational standards, the distribution issue necessarily becomes tied to questions of how the costs of reaching the desired standards vary with differences in student and school characteristics.

Oregon's current state school funding formula does include weights for students with special needs and for remote small schools and reimburses transportation costs at 70% of actual costs. Differences in the cost of doing business in different regions of the state are the most important distribution issues that have not been addressed by the model or the current state school funding formula.

The charge of the Resources and Costs Panel specifically excludes issues of distribution, but in evaluating the detailed cost components of the Quality Education Model, the Panel frequently confronted issues related to distribution. While the Quality Education Model is not a distribution model, its focus on determining the costs of achieving a given level of student achievement has clear implications for the distribution debate. As the Model develops over time, attention should be paid to how the model can be enhanced to provide information valuable to that debate.

Education System Governance
As with distribution issues, governance issues were outside the charge of the Resources and Costs Panel, but the Panel frequently confronted governance issues in its discussions of school cost and resource allocation issues. The issue of governance in education deals with the questions of where in the system

decision-making power lies and to whom the schools will be accountable. Historically, the answer to both questions has been the same: the entity supplying the funding. In Oregon, until the passage of Measure 5 in 1990, the bulk of school funding came from the local property tax, and local voters decided how much they wanted to spend on their schools. Consequently, locally-elected school boards held most of the decision-making power and schools were accountable to the school board and, by extension, to local voters.

The shift in funding to the State brought about by Measure 5 created a tension between state and local policymakers. Because education is delivered locally, and because local conditions (student characteristics, the desires and expectations of parents, etc.) can vary dramatically among communities, local control over school policy is likely to be the most effective way to deliver the type and level of education consistent with local wants and needs. At the same time, with the shift to state funding, the legislature and other state-level policymakers often expect more decision-making power. These are critical issues because the governance relationships that exist in the education system can influence the incentives faced by parents, students, teachers, administrators, and school boards. These incentives, in turn, have a large impact on the effectiveness of the schools in bringing about the desired outcomes.

The Quality Education Model currently does not provide an in-depth analysis of the governance structures in Oregon or make recommendations about what those structures should be. The Model does stress, however, that the purpose of the Model is **not** to dictate specific strategies or organizational structures to local schools. Rather, it is designed to demonstrate that a certain level of funding can reasonably be associated with a certain level of student performance. Local school districts are free to use their resources in the ways they think is best for their students. As the model evolves, it is important that governance issues be given more attention.

## III. Improving the Accuracy and Utility of the Quality Education Model

As a tool for estimating the statewide costs of school programs and evaluating tradeoffs in the costs of funding Oregon's schools, the prototype schools are built from the ground up as the sum of their component parts: teachers, administrators, counselors, support staff, textbooks, supplies, maintenance, etc. In order for the Model to make reliable estimates, it is important that the costs placed on each component be accurate. Accurate cost estimates depend, in turn, on high quality data, appropriate cost estimation methods, and reasonable assumptions in cases where data are not available or are of poor quality.

### *High-Quality Data*

**The quality of the data for key components of the prototype schools is high, and it is improving.**

The primary data sources used to estimate the costs of the prototype schools are the following:

1) The Oregon Database Initiative (DBI): DBI started collecting detailed expenditure data at the school level in 1997-98 for 16 pilot school districts in the state, and starting in 1999-00, DBI will be expanded to include data for all districts in the state. An initial step in the project was to develop a uniform chart of accounts so that the data from each district and school are comparable. As school districts fully implement the new chart of accounts, the accuracy of the DBI data should improve. Database Initiative staff currently are combining the DBI data with other information collected by the Department of Education (described below) into an integrated database. This combined database will allow analysis at a level of detail never before possible.

2) The Oregon Department of Education: The Department of Education has collected a broad range of information from school districts for many years. This information includes data on student enrollment, student test scores, teacher and administrator salaries, staffing levels, budgets, and a variety of other information.

3) Oregon School Boards Association: OSBA collects data on salaries, benefits, and other information for certified teachers in Oregon.

4) Confederation of Oregon School Administrators: COSA collects data on salaries, benefits, and other information for superintendents, principals, and other administrative personnel.

5) Oregon School Employees Association: OSEA collects wage and salary data for the classified employees it represents.

6) The National Center for Education Statistics: NCES is part of the U.S. Department of Education and collects a wide range of data for all school districts in the U.S. The primary value of these data is for making comparisons across states, which often can provide guidance in making assumptions when detailed Oregon data are not available.

In general, the data from each of these sources are of relatively high quality, and that quality should improve over time, particularly for the DBI data when all districts in the state are included in the database and as districts have more time to fully implement the uniform chart of accounts.

### *Costing Methods*

**The methods used to estimate the prices of the inputs to the prototype schools are appropriate.** For most components of the prototypes, the model uses statewide average costs calculated from data on actual Oregon schools as the input prices. In cases where the Database Initiative is the data source, the average is for the 16 pilot districts, not for the entire state. When the DBI data is available for all districts in the state, the data will be more representative. Because most school inputs are purchased in relatively competitive markets, average costs from actual Oregon schools should represent accurate estimates of the prices of inputs specified in the prototype schools.

In estimating the costs of running the prototype schools, it is useful to think of the cost of each component as having two parts: a quantity and a price. The total cost of each component is calculated as the quantity of the input for that component (e.g., the number of teachers) times the price of the input (the teacher salary). The quantities of each input needed to run the prototype schools were estimated during the initial development of the Quality Education Model. Those estimates are based on current research on effective educational practices and on the judgment of the Legislative Council on Quality Education about the resources needed to allow students to meet Oregon's educational standards. The *quantity* half of the cost equation is, in other words, built into the structure and assumptions of the model. What remains is to estimate the *price* half of the equation. Because salaries and benefits represent the largest share of school costs, they are the most important prices we must estimate.

**Accurate salary and benefits estimates are crucial to improving the precision of the model.** While it is important to make accurate cost estimates for all components of the model, it is particularly important to concentrate on those components that represent the largest share of school costs—personnel costs. For the largest cost component in the prototype schools—teacher salaries—the Panel spent considerable effort in verifying the accuracy of the available data and in developing an estimation and forecasting model that can provide accurate estimates of current and future teacher costs (see Appendix A for a description of the model). Salary data for administrative staff, which is based on surveys conducted

each year by the Confederation of Oregon School Administrators, also is of high quality (see Appendix B for average administrator salaries for 1999-00).

The data available on the costs of employee benefits, based on an annual survey by the Oregon School Boards Association, also appears to be of high quality, but the estimation technique used in the Model can be improved. Currently the model estimates the costs of employee benefits by multiplying each employee's base salary by a benefits rate. But because the cost of the most expensive benefit—health insurance—does not vary proportionally with salaries, the accuracy of the model probably would be improved by estimating health insurance costs directly based on actual health insurance cost data.

There is more uncertainty about the accuracy of the wage and salary data for support staff, both for staff assigned to schools and for centralized district staff. Currently, the sources for this data are the DBI pilot data and surveys conducted by the Oregon School Employees Association. Because OSEA does not represent employees in a number of Oregon's largest districts, and because a number of errors were identified in the OSEA survey data, our confidence in the accuracy of these estimates is low. When the DBI data for all districts in the state are available, our confidence will increase.

Over time, the accuracy of the salary and benefits data will improve with added data verification efforts by the Department of Education and by improved data collection methods currently being implemented.

### *Assumptions*

There are two broad categories of assumptions required in constructing the prototype schools. The first category includes assumptions about the structure of the model and the relationships between school inputs and student performance. These assumptions reflect what is known about effective educational practices, and they also reflect policy choices about the level and mix of inputs needed to implement those practices.

The second category of assumptions is more technical in nature and relates to the costs assigned to each component in the prototype school structure. For many of the components of the prototype schools we have relatively good data on the average expenditures for actual schools in Oregon. Implicit in using actual expenditures is the assumption that the inputs needed to effectively operate the prototype schools can be purchased at prices that districts currently face. Given that most school inputs are purchased in relatively competitive markets, this seems a valid assumption.

For some components of the prototype schools, however, cost data either are unavailable or are of poor quality. In these circumstances, making assumptions about the appropriate costs to use in the model is more difficult. Fortunately, the cost components for which we have poor data represent a small share of the total costs of running the prototype schools. It is still important, however, that the assumptions made about these costs are based on the best data available and on sound reasoning and judgment.

The table below shows the major cost components in the prototype schools and the basis of each cost estimate used. The table also indicates the quality of data included in the original Quality Education Model estimates and the improvements to the quality of the data proposed by the Panel. The basis chosen for each cost estimate represents, in essence, the model's assumption about the appropriate way to measure that cost component in the prototype schools. For components where the quality of data in the original model is fair or poor, the Panel assumes that DBI data for the 16 pilot districts is the best data currently available and that the data will improve when DBI data for all districts becomes available.

Following the table is an example of one important cost component where we currently have poor data and where the use of actual expenditures is likely to be a poor assumption about actual costs: the case of Operations and Plant Maintenance costs.

## Data Quality and Basis of Cost Estimates for the Prototype Schools

| Prototype School Component | Original QEM Quality of Data | Proposed Improvements Quality of Data | Basis of Cost Estimate |
|---|---|---|---|
| Teacher Salaries | Good | Very good | Statewide average salary |
| Other Licensed Staff Salaries | Good | Very good | Statewide average salary |
| Administrator Salaries | Good | Very good | Statewide average salary |
| Classified Staff Salaries | Fair | Good | Average of OSEA employees |
| Computer Hardware | Very Good | Very Good | Market prices |
| Textbooks | Good | Good | Expert recommendation |
| Classroom Materials, Equipment, Supplies | Good | Good | Expert recommendation |
| Copying | Good | Good | Expert recommendation |
| Media Center Materials | Good | Good | Expert recommendation |
| Extra-Curricular Activities | Fair | Good | Per student average from DBI |
| Teacher Professional Development | Good | Good | Per diem based on statewide average |
| Food Services | Fair | Good | Assumed to be self-supporting |
| Student Transportation | Fair | Good | Per student average from DBI |
| Technology Services | Fair | Good | Per student average from DBI |
| Operation and Plant Maintenance | Poor | Good | Per student average from DBI |
| Other Support Services | Fair | Good | Per student average from DBI |
| Centralized Special Education | Fair | Good | Per student average from DBI |
| Centralized Administration, School Board | Fair | Good | Per student average from DBI |
| Business and Fiscal Services | Fair | Good | Per student average from DBI |
| Personnel Services | Fair | Good | Per student average from DBI |
| Public Information | Fair | Good | Per student average from DBI |

### *A Key Assumption: Operation and Plant Maintenance Costs*

The intent of the Quality Education Model is to include sufficient resources in the prototype schools to maintain school facilities adequately and efficiently—that is, so that no maintenance needs are deferred. In estimating the required level of spending to accomplish this goal, however, we face a number of problems. First, we currently do not have good data on the condition of school buildings or on the amount spent on building and equipment maintenance. Second, the data we do have on maintenance spending reflects what is actually spent, not the amount required to fully maintain the facilities. If districts are under-maintaining their facilities in order to direct more resources to other activities, actual spending will understate adequate spending. Finally, it is likely that inadequate maintenance in the past increases the costs of current maintenance, but we don't know by how much.

Survey data gathered annually by American School & University magazine indicate that spending on operations and maintenance was about 9.0% of total school operating expenditures (excluding transportation spending) in 1999 for the western U.S. These spending levels are consistent with the level

of operation and maintenance spending reported in the DBI by the 16 pilot districts. The level of operations and maintenance spending is set at $402 per pupil in the prototype schools. This is equivalent to 9% of total operating expenditures, so the Model currently is consistent with actual levels of operations and maintenance spending in Oregon.

American School & University magazine argues, however, that the level of operations and maintenance spending reported in 1999 is inadequate to fully maintain the nation's school facilities and that this under spending has been going on for over a decade. A little more than a decade ago, according to the magazine, operations and maintenance spending was 13% of the total. If the data reported in the American School & University article is correct, then the level of operations and maintenance spending in Oregon is inadequate to fully maintain Oregon's school facilities, and the amount of spending specified in the prototype schools is too low to prevent further deferral of needed maintenance.

**Based on the assumption that the adequate level of operations and maintenance spending is 13% of total current expenditures, the panel recommends that the level of spending in the prototype schools be increased from 9% to 13% of expenditures. Currently, the increase in costs in the model would be from $402 per student to approximately $575 per student. The panel also recommends that the issue of adequate operations and maintenance spending be studied further.**

# IV. Estimating the Statewide Costs of School Programs

The Panel identified a number of key issues to be addressed in improving the Quality Education Model's accuracy and in using the Model to estimate the statewide costs of school programs. The most important of those issues relate to services, and their associated funding sources, that were excluded from the original model. Other important issues include the sensitivity of total costs to changes in the Model's assumptions, differences in costs by region and district size, intangible elements included in the Model, and efficiencies in delivering educational services. Each of these issues is discussed below.

### *Services Excluded from the Original Model and Recommendations for Model Changes*

In using the Quality Education Model to estimate statewide school funding needs, it is important to fully account for all educational services to be funded. If the model is to represent a comprehensive picture of school funding, then any services that currently are excluded from the model should be accounted for. This can be done in one of three ways: by incorporating them into the prototype schools; by including them in the model as separate categories of funding outside the prototype school structure; or by explicitly excluding those services (and their funding sources) from the model. The following educational services currently are not fully accounted for in the Quality Education Model:

- Services provided by Education Service Districts
- Services funded with federal grant dollars
- State funding for special schools and programs operated by the Department of Education
- Services funded by fees and donations
- Extraordinary costs associated with high-needs special education students
- Extraordinary costs of remote schools
- Costs of repairing the accumulated effects of deferred maintenance
- Capital expenditures (and the debt service payments needed to fund them)

One of the responsibilities of the Resources and Costs Panel is to review these exclusions and determine whether these services, and their associated costs, were properly excluded from the Quality Education model. The following sections provide a discussion of the issues related to the exclusions and the Panel's recommendations for whether to continue excluding them or to incorporate them into the model.

## Services Provided by Education Service Districts (ESDs)

**Recommendation: Add ESD services to the prototype schools beginning with the 2001-03 budget cycle or when ESD roles are clarified and funding has been equalized.**

Including services provided by ESDs in the original model was problematic for two reasons. First, ESD funding has not been equalized across the state, so per-student funding varies widely among ESDs. Second, ESDs have not kept track of the costs of services provided to each school district, which prevents us from knowing the differential impact that ESD services have had from district to district.

Currently, a task force commissioned by the 1999 Legislature is performing a comprehensive review of regional services provided to school districts, which should help to resolve the equalization issues. Beginning for the 1999-2000 school year, the Database Initiative will collect information from ESDs on the cost of direct services they provide to school districts. With this information, the costs of direct services to school districts can be added to the prototype schools as central costs in four categories: special education, instructional support, technology services, and ESD overhead costs.

Because ESDs provide a significant level of resources to schools in Oregon—roughly $300 million per biennium—it is important that the services funded by ESDs be included in the Quality Education Model. The Panel expects that the results of the ESD Task Force will form the basis of a proposal to equalize ESD funding and to clarify the role of ESDs in the Oregon's education system. Once that is accomplished, services provided by ESDs (and the associated funding) should be incorporated into the Model, possibly as soon as the 2001-03 budget cycle.

## Services Funded with Federal Grant Dollars

**Recommendation: Continue to exclude services funded through federal grants.**

The majority of categorical federal funding is allocated for students in poverty (Title I) and for special education programs for severely disabled students. Title I monies, which are targeted to schools with a large proportion of students in poverty, supplement state funding for schools with low socio-economic status rankings (the state school distribution formula contains a relatively small weighting (.25) for students in poverty). A growing body of research suggests that the cost of educating students in poverty is significantly higher than for those from higher socio-economic backgrounds. But because there is disagreement on how much higher these costs are, and because the state has very little control over the distribution of Title I dollars, including these funds in the Quality Education Model would needlessly complicate the model.

Similarly, federally funded special education costs could be treated as additional central special education costs in the model, but including these funds would complicate the model without adding any real utility.

## State Appropriations for Special Schools and Programs Operated by the Department of Education

**Recommendation: Continue to exclude costs funded through the state for special schools and programs.**

These include the Oregon Schools for the Blind and Deaf, juvenile corrections facilities, and Regional Programs for students with physical disabilities. Again, the costs of these programs could be treated as additional central costs in the model, but including them would complicate the model without adding any real utility.

Services Funded by Fees and Donations

**Recommendation: Continue to exclude costs that are reimbursed through fees.**

Fee-based services include those for school lunch programs, a portion of the cost of student athletics, and the costs of a variety of other programs. The manner in which fee revenue is accounted for varies from district to district, and because these fees represent an extremely small share of total school funding, the cost of collecting accurate and consistent data is likely to be far greater than the benefits in terms of improving the accuracy of the Model. Services funded through donations should be excluded from the model; however, the Panel does have a concern regarding unreported or under-reported donations and the effect on equity among schools.

The Extraordinary Costs Associated with High-Needs Special Education Students

**Recommendation: Continue to account for the costs of high-needs special education students in the model with a central fund that is outside the prototype schools, and continue efforts to obtain better estimates of the costs of providing services to these high-cost students.**

Currently, the Quality Education Model accounts for the higher costs of providing services to special education students in two ways. First, for low-cost special education students the model provides the prototype schools with funding for special education programs. And second, for high-cost special education students, defined in the model as students requiring services costing in excess of $20,000, the model provides a central fund outside the prototype schools that can be distributed to districts based on need (the model does not specify a distribution method).

The table below shows the level of special education funding currently in the Quality Education Model and also includes the roughly $70 million in ESD funding recommended for inclusion in the Model. The table compares per pupil funding in the Model with the level allocated to schools through the State's distribution formula. Based on these estimates of actual spending for special education students, it appears that the Model includes sufficient funding to continue current special education programs.

## Special Education Funding in the Quality Education Model*
### 1998-99 School Year

| | | |
|---|---|---|
| **Number of Oregon School-Aged Special Education Students**** | 64,247 | |
| **Funding Currently Included in the Prototype Schools** | | $229,800,000 |
| **ESD Funding Recommended for Inclusion in the Prototype Schools** | | $70,000,000 |
| **State Centralized Funding Outside the Prototype Schools** | | $30,000,000 |
| **Total Special Education Funding in the QEM** | | $329,800,000 |
| **Funding per Special Education Student in the QEM** | | $5,133 |
| **Funding per Special Education Student in the QEM Excluding ESD Funds** | | $4,044 |
| **Funding per Special Education Student in the State Distribution Formula** | | $4,010 |

* Excludes funding of state-run facilities and about $40 million in funding from the federal government.

** Includes only students served by local school districts. Excludes students in state-run facilities.

Source: Oregon Department of Education, Database Initiative Project 10-Apr-00
d:/br/qem/special ed.xls

The approach of funding low-cost special education students in the prototype schools and high-cost special education students centrally should be retained in the model, but further work is needed to determine the appropriate level of funding for the high-cost students.

## The Extraordinary Costs of Remote Schools

**Recommendation: Study the differences in school operating costs for remote and/or geographically large school districts.**

Oregon schools in remote, sparsely populated areas face higher costs than other schools primarily for two reasons. First, they must transport a larger percentage of their students, and they must transport them longer distances. And second, remote schools typically are smaller than schools in more densely populated areas, often preventing them from using their resources as efficiently as larger schools can.

The Quality Education Model uses statewide average transportation costs to estimate the transportation cost component of the prototype schools. The model captures, therefore, the higher transportation costs faced by remote schools. The degree to which transportation costs vary among school districts, and any State efforts to compensate remote schools for higher transportation costs, is a distribution issue beyond the scope of the Resources and Costs Panel's charge.

The Model currently does not, however, account for the higher costs faced by small, remote school districts due to their inability to use their resources as efficiently as larger, more centrally-located districts. In most cases, the source of these inefficiencies is the smaller class sizes and student/staff ratios that occur in districts that have very small numbers of students. Further study of small, remote school districts is needed to better understand these cost differences.

## Accumulated Deferred Maintenance

**Recommendation: Continue to exclude from the model the costs of repairing the effects of deferred maintenance. The state should compile a comprehensive inventory of the condition of Oregon's school buildings and explore funding mechanisms to finance the repair and upgrade of schools.**

Although the state does not have an inventory of school district capital needs, anecdotal evidence and trends in maintenance spending suggest that many districts in the state have at least some schools that have a significant amount of deferred maintenance. In most cases, these conditions arose because budget constraints led districts to reduce maintenance spending in order to direct those resources to activities more directly related to student learning.

While adequate maintenance expenditures are properly categorized as operating costs that should be (and are) included in the prototype schools, repairing the effects of existing deferred maintenance is more accurately viewed as a capital requirement. For this reason, and because the level of resources needed to repair the accumulated effects of deferred maintenance varies considerably from district to district, deferred maintenance should be addressed outside the Quality Education Model.

## Capital Expenditures and Debt Service Payments

**Recommendation: Continue to exclude capital expenditures and debt service payments from the model.**

The Panel further recommends that a separate Panel be appointed to study capital needs and deferred maintenance in school districts. The state also should develop a school infrastructure model to help policymakers better understand the capital funding and maintenance needs of school districts.

The Quality Education Model appropriately focuses on funding school operating costs, and capital spending should be excluded from the Model. The Model does, however, have implications for the level

of capital funding needed to support the operation of the prototype schools, so the issue of capital spending cannot be ignored.

Under Oregon law, the financing of expenditures for school capital improvements is the responsibility of local school districts. Districts finance debt service payments required to fund capital spending by levying local property taxes that must be approved by local voters. Measure 5, by shifting the bulk of school operating funding to the state but leaving the responsibility for funding school capital needs with local voters, created a situation where local voters may be unwilling to fund capital improvements at a level adequate to support the school programs funded by the state.

The issue of adequate capital investment becomes particularly important in the context of the prototype schools. Because the prototypes specify smaller class sizes than currently exist in most Oregon schools, adoption of the class sizes specified in the prototypes would require the addition of a substantial number of new classrooms in many districts. In some districts, however, it is likely that local voters will be unwilling to approve the levies required to finance the construction of additional classrooms. If this situation becomes widespread, or if the state wishes to encourage the movement toward smaller class sizes, the state might consider providing financial support and incentives to equalize capital spending among school districts at a level sufficient to support the desired class sizes. State involvement in school capital spending raises a number of complex issues, however, and those issues should be addressed outside the structure of the Quality Education Model.

To help school districts to use their capital resources most efficiently and to better understand the effects of education policies on the infrastructure needs of school districts, the State should construct a school infrastructure model that recognizes that capital investment and the maintenance expenditures are linked, and that they often are viewed as trade-offs by school districts. The infrastructure model should take into account the relationship between capital improvements, routine maintenance, deferred maintenance, and the building replacement cycle. The infrastructure model also should explicitly address the question of what types of buildings are needed to achieve the educational goals specified in the Quality Education Model. The infrastructure model should then be linked to the Quality Education Model.

### *The Sensitivity of Total School Costs to Changes in Model Assumptions*

One of the most useful applications of the Quality Education Model is to estimate how sensitive total school costs are to changes in assumptions about the level and cost of the models inputs. For example, the model can estimate how much total costs would decline if teacher salaries increased slower than expected, or how much more funding would be required to reduce class sizes from the level specified in the original model. Used in this way, the model can be a very valuable tool to help policymakers understand the tradeoffs involved in changing the level and mix of inputs used in Oregon's schools. Appendix B provides some examples using the model for this type of sensitivity analysis.

### *Differences in Costs by Region and District Size*

The cost of providing a given level of educational services can vary regionally because the prices that districts must pay for school inputs are different in different parts of the state. This cost variation is due largely to cost of living differences that are reflected in the salaries districts must pay to attract qualified teachers and staff. In general, teacher and staff salaries are higher in urban areas than in rural areas, and salaries typically increase with urban size. The fact that the cost of providing a given level of educational services is higher in some areas of the state than in others has important implications for educational equity. In systems, such as Oregon's, that provide roughly equal per pupil funding to all districts, districts facing higher input prices are unable to provide the same level of services as districts facing lower prices.

Researchers also have found cost differences related to school district size. In general, per pupil costs tend to be higher for very small and very large districts. Regional cost differences and cost differences related

to district size are distributional issues outside the scope of the Resources and Costs Panel. They are, however, important policy issues that require further study and discussion.

### *Intangible Elements in the Quality Education Model*

The intangible dimensions of the Quality Education Model represent the assumptions about the functioning of the education system in ways that affect its delivery of programs and services. To a significant extent, these are measures of human behavior within organizational structures. Most often they do not have direct costs associated with them.

In trying to incorporate intangible elements into Quality Education Model, three important questions arise. First, what are the intangible elements that are most important to student learning? Second, what can be done to promote higher levels of those intangible elements? And third, how much will it cost? While much research has been done on identifying the intangible elements important to student learning, less is known about how to promote beneficial intangible elements and how much it will cost to do so. For this reason, the Quality Education Model currently does not assign a cost to them. As we learn more about the link between intangible elements and student learning, we can begin to develop methods to promote those elements and to estimate their costs.

### *Efficiency in Delivering Educational Services*

Efficiency in the delivery of educational services is one of the most complex issues facing educators. In an education context, efficiency can be defined as achieving a given level of student performance for the least cost. In practice, attempts to measure efficiency in education have been confounded by the fact that many factors, most of them very difficult to measure, affect student performance. It is, therefore, difficult to distinguish between cost differences that are related to differences in efficiency and those that are related to other factors, such as student characteristics.

Researchers recently have begun developing techniques to better measure efficiency as part of efforts to estimate the costs of providing a given level of educational services, but those measures are complex and still relatively crude. For this reason, the Quality Education Model does not explicitly account for differences in efficiency that might occur in the prototype schools relative to current practice in Oregon's schools. By basing the cost of many of the components of the prototype schools on actual costs experienced in Oregon schools, however, the Quality Education Model *implicitly* assumes that the level of efficiency that can be achieved by the prototype schools is roughly equivalent to the average level of efficiency that currently exists in Oregon schools.

The issue of efficiency in delivering educational services is one that requires further study. In addressing the efficiency issue, the Panel identified the following areas to consider:

1) The potential for cost savings through the regional provision of certain services, such as technology and data processing services.
2) The potential for costs savings through providing internally certain services that currently are contracted out or, conversely, contracting out certain services that currently are provided internally.
3) The creation of incentives for efficient or inefficient behavior when certain district costs are reimbursed by the state (e.g., transportation costs).
4) The potential for reduced long-term maintenance expenditures by using life-cycle costing methods to identify the most efficient level of school replacement and maintenance spending.
5) The potential for cost reductions through coordinated purchasing of certain inputs where districts can get lower prices by purchasing as a group.

# V. Providing a Tool to Support Policy Decisions

In addition to estimating the statewide costs of school programs, an important use of the Quality Education Model is as a tool for policymakers to evaluate important tradeoffs related to school funding levels and to the mix of inputs used in schools. Used in this way, the model can help focus the policy debate on the factors that affect student learning rather than on the abstract notion of a single, statewide education budget amount. The model, because it provides a great deal of detail about the actual inputs used to deliver education services, will help make it clear to policymakers that changes in funding levels necessarily lead to changes in the quantities of inputs that schools are able to buy. Policymakers will then be able to discuss whether the inputs being used in Oregon schools are the correct ones, and in the correct amounts, rather than simply debating whether the proposed education budget is sufficient or not. This more focused debate should lead to more informed policy decisions.

Using the detailed data available through the Database Initiative, the Quality Education Model will allow policymakers to ask questions at a level of detail not possible in the past. Following are some examples of the types of questions the Model can help answer:

a. How much additional funding would be required to reduce K-3 class sizes by one student, given no reduction in other school inputs? Or alternatively, what other inputs must be cut to reduce class size by one student, holding spending constant?
b. What will be the effect on required funding if high levels of teacher retirements lead to a teacher shortage, requiring increases in teacher salaries?
c. What amount of resources is freed up for alternative uses if more efficient administrative structures can cut administrative costs?

In order for the Model to be an effective tool for policymakers to answer these types of questions, the model must be kept understandable and easy to use as it is enhanced over time. To do this, there must be a clear explanation of how the model works, detailed documentation of the Model's assumptions, and an easy to use interface included in the spreadsheets that perform the cost calculations for the prototype schools.

### *Comparing the Prototype Schools to Actual Oregon Schools*

An example of the use of the Model that can be informative to policymakers is to compare the prototype schools in the Model to actual schools. Although the prototype schools are not intended to portray the situation of any particular school in Oregon, it can be instructive to compare the prototypes with actual schools to see how the Quality Education Model's vision for an effective school compares with actual practice.

A particular Oregon school would be expected to differ from the prototype school in a number of important ways. Primary among these will be differences in the characteristics of the students being served, which vary considerably from school to school and district to district. Other important differences include school size (measured by enrollment), input prices (particularly teacher salaries), and the type and breadth of programs offered at the school.

The Panel compared the prototypes to actual schools to:

1) Compare existing program levels to those recommended in the prototypes.
2) Validate the accuracy of model costs, components, and assumptions.
3) Examine the ways that various schools are allocating resources and how they are performing.

Great care must be taken in interpreting these types of comparisons, however. Because actual schools have a limited amount of money to spend, the differences in the resources they choose and those specified in the prototype school may be primarily a result of their budget constraint, not their preferences. For

example, if the comparison school has higher class sizes than those specified in the prototype, it is likely because they can't afford to reduce them any further, not necessarily that they prefer larger class sizes.

In general, the level and mix of resources used in actual schools will differ from those specified in the prototype schools for three reasons:

1) The actual school has different needs because the characteristics of its students differ significantly from the assumptions of the prototype.
2) The actual school thinks a different resource mix will better serve its students than the mix specified in the prototype.
3) The actual school's budget constraint prevents it from using the level and mix of resources it would prefer.

The third of these represents a major challenge in trying to compare actual schools with the prototypes. Because the per student level of funding that currently exists in Oregon is well below the level needed to fully fund the prototype schools, comparisons between actual schools and the prototypes are likely to reveal primarily the effects of district budget constraints: districts simply cannot afford to offer all of the programs and services that the prototype schools specify.

Despite the pitfalls of comparing actual schools to the prototypes, such comparisons can provide valuable information. Because the prototype schools assume a student body with 'typical' characteristics, the comparisons can reveal how schools with significantly different student characteristics respond in terms of their resource allocations. The comparisons also may reveal how teachers and administrators prioritize the use of their resources given that, under their budget constraints, they are unable to offer all the programs and services that the Quality Education Model says are important. Appendix C provides a series of comparisons between the prototype schools and actual Oregon schools.

## VI. Improving the Model's Capability to Tie Funding Levels to Student Performance

Establishing the relationship between education funding levels and student performance remains a major challenge for the education community. To date, research attempting to directly related spending levels to student performance has not provided any firm answers. We don't have a clear understanding about how inputs translate into outputs because the process of teaching and learning is complex and is not fully understood.

Rather than trying to establish a direct link between spending and student achievement, a more promising approach involves first increasing our understanding of effective teaching practices and the other intangibles that lead to student learning, then determining how to promote those intangible elements and estimating how much it will cost to do so. Efforts to find a direct link between funding and student performance are unlikely to bear fruit because they ignore the complex processes by which school inputs are translated into student learning.

The Resources and Costs Panel recommends, therefore, that efforts to tie funding to student performance focus not on the detailed cost components of the Model, but rather on identifying and understanding the elements of the education process which lead to better student outcomes. As our knowledge in that area increases, we can begin to develop measures of how much it costs to promote those elements in Oregon's schools.

# Appendix A: Forecasting Average Teacher Salaries

Because teacher salaries represent the largest share of total school spending for operations in Oregon, having accurate forecasts of average teacher salaries is essential in predicting future school funding requirements. A number of options for forecasting teacher salaries exist: professional judgment, simple trend analysis, and statistical methods are the most common. Below we describe a statistical approach that estimates the variation in average teacher salaries based on factors that influence the change in teacher salaries over time. Once the relationship between average salaries and those factors is established, forecasts of average teachers salaries can be made based on forecasts of the factors that influence salaries.

In estimating the average teacher salary for a given year, it is useful to break teachers into two groups: teachers who taught in the prior year and returned, and teachers who are new. The table below shows average salaries for these two groups over the period 1993-94 to 1998-99. Also shown are average salaries for teachers who left teaching in Oregon (Non-returning teachers).

## Average Salaries of Oregon K-12 Public School Teachers

| | | | Returning Teachers | | New Teachers | | Non-Returning Teachers | |
|---|---|---|---|---|---|---|---|---|
| School Year | Average Teacher Salary | Percent Change | Share of Total | Average Salary | Share of Total | Average Salary | Share Not Returning | Prior-Year Avg. Salary |
| 1992-93 | $36,057 | | | | | | | |
| 1993-94 | $37,771 | 4.8% | 93.7% | $38,335 | 6.4% | $30,735 | 9.3% | $34,918 |
| 1994-95 | $38,599 | 2.2% | 91.5% | $39,293 | 8.5% | $30,927 | 7.9% | $37,444 |
| 1995-96 | $39,750 | 3.0% | 92.0% | $40,502 | 8.0% | $30,658 | 7.5% | $37,429 |
| 1996-97 | $41,115 | 3.4% | 92.1% | $41,881 | 7.9% | $31,886 | 7.4% | $38,008 |
| 1997-98 | $42,289 | 2.9% | 90.9% | $43,214 | 9.1% | $32,531 | 8.6% | $39,945 |
| 1998-99 | $43,005 | 1.7% | 87.5% | $44,300 | 12.5% | $33,489 | 11.0% | $43,371 |

Source: Oregon Department of Education, Database Initiative Project

A number of things stand out in the table. First, average salaries for new teachers are well below those for returning teachers, reflecting the fact that new teachers are lower on the salary scale than experienced teachers. Second, the share of teachers who are new grew dramatically over the period, reflecting an increasing number of retirements in the later years. And third, the salaries of non-returning teachers (most of whom leave teaching because of retirement) are well above the salaries of new teachers, and this difference has increased over time. The replacement of high-salary experienced teachers with lower-salary new teachers provides downward pressure on average salaries, and this has kept average salary growth in Oregon quite low in recent years.

Because returning teacher salaries are dramatically higher than those of new teachers, the relative sizes of those two groups have a large influence on the overall average salary. In developing a model to forecast the overall average salary, therefore, it is important to account separately for the influences of returning teachers and new teachers. Specifically, our model estimates the average teacher salary in a given year as a function of three factors:

1) The average salary in the prior year.
2) The percentage increase in salaries of returning teachers.
3) The share of teachers who are new in that year.

While this model is relatively simple, it predicts quite well the average salary in a given year, and it has an additional characteristic that is quite important. As noted earlier, to forecast average salaries, we apply the relationship developed in the statistical model to forecasts of the factors used to predict average salaries: in this case the percentage increase in the salaries of returning teachers and the share of teachers who are new. Fortunately, we have relatively good information to help us forecast future values of these factors. The salaries of returning teachers are determined primarily by the salary agreements that school districts make with the teacher unions. The percentage of teachers who are new is determined primarily by the rate of retirements of existing teachers. The rate of retirements can be predicted fairly accurately using a cohort-survival type of model that is based on teacher ages.

The table below shows the information used to predict average teacher salaries over the years for which we currently have data and the model's estimated average salaries. While the model quite accurately fits the data over the historical period, a note of caution is needed. Our dataset includes only seven years of data, which is quite small for this type of model. As more years of data are acquired, and as the quality of our data improves, the relationships in the model may change. At the same time, however, as we get more data we will have more confidence in the accuracy of our forecasts.

## Estimation of Average Teacher Salaries

**Based on Prior-Year Salary, the Change in Salaries of Returning Teachers, and the Percent of Teachers Who are New**

| School Year | Average Teacher Salary | Change in Avg. Salary of Returning Teachers | Percent of Teachers Who are New | Predicted Average Teacher Salary | Predicted Difference from Actual |
|---|---|---|---|---|---|
| 1992-93 | $36,057 | | | | |
| 1993-94 | $37,771 | 5.76% | 6.4% | $37,773 | $2 |
| 1994-95 | $38,599 | 3.99% | 8.5% | $38,599 | $0 |
| 1995-96 | $39,750 | 4.58% | 8.0% | $39,752 | $2 |
| 1996-97 | $41,115 | 4.91% | 7.9% | $41,103 | -$12 |
| 1997-98 | $42,289 | 4.82% | 9.1% | $42,300 | $11 |
| 1998-99 | $43,005 | 4.91% | 12.5% | $43,003 | -$2 |

Source: Oregon Department of Education, Database Initiative Project

The next step in forecasting average teacher salaries is to apply the relationships developed in the model to forecasts of the change in the average salaries of returning teachers and the percent of teachers who are new.

# Appendix B: Average Administrator Salaries

## Average School Administrator Salaries*

**1999-00 School Year**

| | |
|---|---|
| Superintendents | $84,381 |
| Deputy/Assistant Superintendents | $73,576 |
| Principals | |
| Elementary | $69,360 |
| Middle School | $74,357 |
| High School | $77,474 |
| Assistant/Vice Principals | |
| Elementary | $61,433 |
| Middle School | $66,659 |
| High School | $68,706 |

* Calculation of average salary includes 6% employee share of PERS for districts that pay it for their employees

Source: Database Initiative Project calculations based on data from Confederation of Oregon School Administrators

# Appendix C: Sensitivity of School Costs to Model Assumptions

One of the most informative uses of the Quality Education Model for policymakers is in estimating the statewide funding impacts of changing the assumptions of the Model. The following pages contain a series of model "runs" which show the impact of changing some of the basic assumptions of the Model. For each of the runs, the tables show funding levels, and the difference from the base case, for school year 1998-99 (the base year for Quality Education Model) and for the current school year 1999-00.

# Quality Education Model Sensitivity Analysis

## Case 1: Reduce K-3 Class Size from 20 to 18

| | Base Case | Sensitivity Case | Difference | Percent Difference |
|---|---|---|---|---|
| Total per Pupil Costs 1998-99 | | | | |
| Elementary Schools | $6,302 | $6,518 | $216 | 3.43% |
| Middle Schools | $6,288 | $6,288 | $0 | 0.00% |
| High Schools | $6,525 | $6,525 | $0 | 0.00% |
| Total per School Costs 1998-99 | | | | |
| Elementary Schools | $2,142,648 | $2,216,045 | $73,397 | 3.43% |
| Middle Schools | $3,144,025 | $3,144,025 | $0 | 0.00% |
| High Schools | $6,524,764 | $6,524,764 | $0 | 0.00% |
| Total Statewide Costs for 1998-99 | $3,448,594,789 | $3,502,998,680 | $54,403,891 | 1.58% |
| Total Statewide Costs for 1999-00 | $3,619,987,175 | $3,676,621,626 | $56,634,451 | 1.56% |

## Key Assumptions

| | Base Case Assumptions | Sensitivity Case Assumptions |
|---|---|---|
| **Class Size and Student/Teacher Ratios** | | |
| Elementary Class Size | | |
| K-3 | 20 | 18 |
| 4-5 | 20 | 20 |
| Middle School Student/Teacher Ratio | 18.52 | 18.52 |
| High-School Student/Teacher Ratio | 17.62 | 17.62 |
| **Salaries and Benefits** | | |
| Avg. Teacher Salary Growth 1997-98 to 1998-99 (Causes average salaries shown below to change) | 2.75% | 2.75% |
| Average Teacher Salaries 1998-99* | | |
| Elementary Schools | $43,090 | $43,090 |
| Middle Schools | $43,916 | $43,916 |
| High Schools | $43,916 | $43,916 |
| Average Principal Salary | | |
| Elementary Schools | $62,577 | $62,577 |
| Middle Schools | $74,404 | $74,404 |
| High Schools | $78,656 | $78,656 |
| Average Assistant Principal Salary | | |
| Middle Schools | $63,919 | $63,919 |
| High Schools | $67,859 | $67,859 |
| Support Staff Hourly Wage Rates | | |
| Principal's Secretary | $12.00 | $12.00 |
| All Other Support Staff | $10.00 | $10.00 |
| Benefits as Percent of Salary | | |
| Teachers and Adminstrative Staff | 34.2% | 34.2% |
| Classified Support Staff | 34.2% | 34.2% |
| **Operations and Maintenance** | | |
| Operations and Maintenance Costs per Student | $402 | $402 |

* Calculation of average salary includes 6% Employee share of PERS for districts that pay it for their employees.

# Quality Education Model Sensitivity Analysis

## Case 2: Increase the Growth Rate for Teacher Salaries from 2.75% to 3.75%

| | Base Case | Sensitivity Case | Difference | Percent Difference |
|---|---|---|---|---|
| Total per Pupil Costs 1998-99 | | | | |
| Elementary Schools | $6,302 | $6,342 | $40 | 0.63% |
| Middle Schools | $6,288 | $6,323 | $35 | 0.56% |
| High Schools | $6,525 | $6,561 | $36 | 0.55% |
| Total per School Costs 1998-99 | | | | |
| Elementary Schools | $2,142,648 | $2,156,155 | $13,507 | 0.63% |
| Middle Schools | $3,144,025 | $3,161,519 | $17,494 | 0.56% |
| High Schools | $6,524,764 | $6,560,757 | $35,992 | 0.55% |
| Total Statewide Costs for 1998-99 | $3,448,594,789 | $3,468,907,728 | $20,312,939 | 0.59% |
| Total Statewide Costs for 1999-00 | $3,619,987,175 | $3,641,132,945 | $21,145,770 | 0.58% |

## Key Assumptions

| | Base Case Assumptions | Sensitivity Case Assumptions |
|---|---|---|
| **Class Size and Student/Teacher Ratios** | | |
| Elementary Class Size | | |
| K-3 | 20 | 20 |
| 4-5 | 20 | 20 |
| Middle School Student/Teacher Ratio | 18.52 | 18.52 |
| High-School Student/Teacher Ratio | 17.62 | 17.62 |
| **Salaries and Benefits** | | |
| Avg. Teacher Salary Growth 1997-98 to 1998-99 (Causes average salaries shown below to change) | 2.75% | 3.75% |
| Average Teacher Salaries 1998-99* | | |
| Elementary Schools | $43,090 | $43,510 |
| Middle Schools | $43,916 | $44,344 |
| High Schools | $43,916 | $44,344 |
| Average Principal Salary | | |
| Elementary Schools | $62,577 | $62,577 |
| Middle Schools | $74,404 | $74,404 |
| High Schools | $78,656 | $78,656 |
| Average Assistant Principal Salary | | |
| Middle Schools | $63,919 | $63,919 |
| High Schools | $67,859 | $67,859 |
| Support Staff Hourly Wage Rates | | |
| Principal's Secretary | $12.00 | $12.00 |
| All Other Support Staff | $10.00 | $10.00 |
| Benefits as Percent of Salary | | |
| Teachers and Adminstrative Staff | 34.2% | 34.2% |
| Classified Support Staff | 34.2% | 34.2% |
| **Operations and Maintenance** | | |
| Operations and Maintenance Costs per Student | $402 | $402 |

* Calculation of average salary includes 6% Employee share of PERS for districts that pay it for their employees.

# Quality Education Model Sensitivity Analysis

## Case 3: Increase Operations and Maintenance Spending from $402 to $575 per Pupil

| | Base Case | Sensitivity Case | Difference | Percent Difference |
|---|---|---|---|---|
| Total per Pupil Costs 1998-99 | | | | |
| Elementary Schools | $6,302 | $6,475 | $173 | 2.75% |
| Middle Schools | $6,288 | $6,461 | $173 | 2.75% |
| High Schools | $6,525 | $6,698 | $173 | 2.65% |
| Total per School Costs 1998-99 | | | | |
| Elementary Schools | $2,142,648 | $2,201,468 | $58,820 | 2.75% |
| Middle Schools | $3,144,025 | $3,230,525 | $86,500 | 2.75% |
| High Schools | $6,524,764 | $6,697,764 | $173,000 | 2.65% |
| Total Statewide Costs for 1998-99 | $3,448,594,789 | $3,542,323,805 | $93,729,017 | 2.72% |
| Total Statewide Costs for 1999-00 | $3,619,987,175 | $3,717,559,081 | $97,571,906 | 2.70% |

## Key Assumptions

| | Base Case Assumptions | Sensitivity Case Assumptions |
|---|---|---|
| **Class Size and Student/Teacher Ratios** | | |
| Elementary Class Size | | |
| K-3 | 20 | 20 |
| 4-5 | 20 | 20 |
| Middle School Student/Teacher Ratio | 18.52 | 18.52 |
| High-School Student/Teacher Ratio | 17.62 | 17.62 |
| **Salaries and Benefits** | | |
| Avg. Teacher Salary Growth 1997-98 to 1998-99 (Causes average salaries shown below to change) | 2.75% | 2.75% |
| Average Teacher Salaries 1998-99* | | |
| Elementary Schools | $43,090 | $43,090 |
| Middle Schools | $43,916 | $43,916 |
| High Schools | $43,916 | $43,916 |
| Average Principal Salary | | |
| Elementary Schools | $62,577 | $62,577 |
| Middle Schools | $74,404 | $74,404 |
| High Schools | $78,656 | $78,656 |
| Average Assistant Principal Salary | | |
| Middle Schools | $63,919 | $63,919 |
| High Schools | $67,859 | $67,859 |
| Support Staff Hourly Wage Rates | | |
| Principal's Secretary | $12.00 | $12.00 |
| All Other Support Staff | $10.00 | $10.00 |
| Benefits as Percent of Salary | | |
| Teachers and Adminstrative Staff | 34.2% | 34.2% |
| Classified Support Staff | 34.2% | 34.2% |
| **Operations and Maintenance** | | |
| Operations and Maintenance Costs per Student | $402 | $575 |

* Calculation of average salary includes 6% Employee share of PERS for districts that pay it for their employees.

# Quality Education Model Sensitivity Analysis

## Case 4: Increase Employee Benefits Costs by 10%

| | Base Case | Sensitivity Case | Difference | Percent Difference |
|---|---|---|---|---|
| Total per Pupil Costs 1998-99 | | | | |
| Elementary Schools | $6,302 | $6,422 | $120 | 1.90% |
| Middle Schools | $6,288 | $6,401 | $113 | 1.80% |
| High Schools | $6,525 | $6,640 | $115 | 1.76% |
| Total per School Costs 1998-99 | | | | |
| Elementary Schools | $2,142,648 | $2,183,377 | $40,729 | 1.90% |
| Middle Schools | $3,144,025 | $3,200,514 | $56,489 | 1.80% |
| High Schools | $6,524,764 | $6,639,618 | $114,853 | 1.76% |
| Total Statewide Costs for 1998-99 | $3,448,594,789 | $3,511,825,367 | $63,230,578 | 1.83% |
| Total Statewide Costs for 1999-00 | $3,619,987,175 | $3,685,810,207 | $65,823,032 | 1.82% |

## Key Assumptions

| | Base Case Assumptions | Sensitivity Case Assumptions |
|---|---|---|
| **Class Size and Student/Teacher Ratios** | | |
| Elementary Class Size | | |
| K-3 | 20 | 20 |
| 4-5 | 20 | 20 |
| Middle School Student/Teacher Ratio | 18.52 | 18.52 |
| High-School Student/Teacher Ratio | 17.62 | 17.62 |
| **Salaries and Benefits** | | |
| Avg. Teacher Salary Growth 1997-98 to 1998-99 (Causes average salaries shown below to change) | 2.75% | 2.75% |
| Average Teacher Salaries 1998-99* | | |
| Elementary Schools | $43,090 | $43,090 |
| Middle Schools | $43,916 | $43,916 |
| High Schools | $43,916 | $43,916 |
| Average Principal Salary | | |
| Elementary Schools | $62,577 | $62,577 |
| Middle Schools | $74,404 | $74,404 |
| High Schools | $78,656 | $78,656 |
| Average Assistant Principal Salary | | |
| Middle Schools | $63,919 | $63,919 |
| High Schools | $67,859 | $67,859 |
| Support Staff Hourly Wage Rates | | |
| Principal's Secretary | $12.00 | $12.00 |
| All Other Support Staff | $10.00 | $10.00 |
| Benefits as Percent of Salary | | |
| Teachers and Adminstrative Staff | 34.2% | 37.6% |
| Classified Support Staff | 34.2% | 37.6% |
| **Operations and Maintenance** | | |
| Operations and Maintenance Costs per Student | $402 | $402 |

* Calculation of average salary includes 6% Employee share of PERS for districts that pay it for their employees.

# Quality Education Model Sensitivity Analysis

## Case 5: Increase the Student/Teacher Ratio in High School by One Student

| | Base Case | Sensitivity Case | Difference | Percent Difference |
|---|---|---|---|---|
| Total per Pupil Costs 1998-99 | | | | |
| Elementary Schools | $6,302 | $6,302 | $0 | 0.00% |
| Middle Schools | $6,288 | $6,288 | $0 | 0.00% |
| High Schools | $6,525 | $6,341 | -$183 | -2.81% |
| Total per School Costs 1998-99 | | | | |
| Elementary Schools | $2,142,648 | $2,142,648 | $0 | 0.00% |
| Middle Schools | $3,144,025 | $3,144,025 | $0 | 0.00% |
| High Schools | $6,524,764 | $6,341,282 | -$183,482 | -2.81% |
| Total Statewide Costs for 1998-99 | $3,448,594,789 | $3,418,888,998 | -$29,705,790 | -0.86% |
| Total Statewide Costs for 1999-00 | $3,619,987,175 | $3,589,063,447 | -$30,923,728 | -0.85% |

## Key Assumptions

| | Base Case Assumptions | Sensitivity Case Assumptions |
|---|---|---|
| **Class Size and Student/Teacher Ratios** | | |
| Elementary Class Size | | |
| K-3 | 20 | 20 |
| 4-5 | 20 | 20 |
| Middle School Student/Teacher Ratio | 18.52 | 18.52 |
| High-School Student/Teacher Ratio | 17.62 | 18.62 |
| **Salaries and Benefits** | | |
| Avg. Teacher Salary Growth 1997-98 to 1998-99 (Causes average salaries shown below to change) | 2.75% | 2.75% |
| Average Teacher Salaries 1998-99* | | |
| Elementary Schools | $43,090 | $43,090 |
| Middle Schools | $43,916 | $43,916 |
| High Schools | $43,916 | $43,916 |
| Average Principal Salary | | |
| Elementary Schools | $62,577 | $62,577 |
| Middle Schools | $74,404 | $74,404 |
| High Schools | $78,656 | $78,656 |
| Average Assistant Principal Salary | | |
| Middle Schools | $63,919 | $63,919 |
| High Schools | $67,859 | $67,859 |
| Support Staff Hourly Wage Rates | | |
| Principal's Secretary | $12.00 | $12.00 |
| All Other Support Staff | $10.00 | $10.00 |
| Benefits as Percent of Salary | | |
| Teachers and Adminstrative Staff | 34.2% | 34.2% |
| Classified Support Staff | 34.2% | 34.2% |
| **Operations and Maintenance** | | |
| Operations and Maintenance Costs per Student | $402 | $402 |

* Calculation of average salary includes 6% Employee share of PERS for districts that pay it for their employees.

# Appendix D: Comparison of the Prototype Schools to Actual Oregon Schools

The table on the following pages compares the allocation of spending in the Quality Education Model's prototype elementary school with spending in two actual Oregon elementary schools. The first school, labeled "TRSD", is an elementary school of 336 students in grades K-5 in the Three Rivers School District in Josephine County. The second school, labeled "HPE", is Hudson Park Elementary School in the Rainier School District in Columbia County. Hudson Park has 345 students in grades K-3. The prototype school, labeled "Model", has 340 students in grades K-5.

The purpose of the comparisons is to provide an example of one important use of the Quality Education Model: to evaluate how and why spending patterns in actual Oregon schools differs from the spending patterns specified in the prototype schools. The two actual schools in the comparison were chosen because they are very close to the same size (measured by enrollment) as the prototype elementary school in the Quality Education Model. This allows the comparisons to focus on differing costs resulting from differences in program levels or input mixes rather than from differences in school size. It is important to note, however, that both of the actual schools, in compiling data for the comparisons, used the average teacher salary specified in the model rather than actual teacher salaries.

# Quality Education Model

**TRSD=Three Rivers School District Elementary School: 336 Students**

**HPE=Hudson Park Elementary School in Rainier School District: 345 Students**

**Model=Quality Education Model Prototype Elementary School: 340 Students**

| Program Element: | Component | FTE | | | Element Cost | | |
|---|---|---|---|---|---|---|---|
| | | TRSD | HPE | Model | TRSD | HPE | Model |
| Core staff | Kindergarten | 1.00 | 2.00 | 2.00 | $ 57,827 | $ 115,654 | $ 115,654 |
| | 1-3 | 8.00 | 12.00 | 9.00 | $ 462,617 | $ 693,925 | $ 520,444 |
| | 4-5 | 5.00 | | 5.00 | $ 289,136 | | $ 289,136 |
| Program staff | music, PE, art, media, 2nd lang., reading specialist | 0.00 | 2.00 | 4.50 | $ - | $ 115,654 | $ 260,222 |
| | ESL | 0.05 | | 0.50 | $ 2,891 | | $ 28,914 |
| Special education staff | | 1.35 | 1.00 | 1.50 | $ 78,067 | $ 57,827 | $ 86,741 |
| Instructional improvement | | 0.05 | 0.00 | 0.50 | $ 28,914 | | $ 28,914 |
| Instructional support staff assistance | Classified- | 4.00 | 4.00 | 5.00 | $ 79,446 | $ 79,446 | $ 99,308 |
| | Secretary | 1.00 | 1.00 | 1.00 | $ 29,002 | $ 29,368 | $ 27,055 |
| Administrative accountability | Principal | 1.00 | 1.00 | 1.00 | $ 83,062 | $ 76,450 | $ 83,978 |
| Computer hardware/software | Hardware including student and administrative | | | | $ - | $ 8,000 | $ 17,000 |

# Quality Education Model

**TRSD=Three Rivers School District Elementary School: 336 Students**

**HPE=Hudson Park Elementary School in Rainier School District: 345 Students**

**Model=Quality Education Model Prototype Elementary School: 340 Students**

| Program Element: | Component | FTE | | | Element Cost | | |
|---|---|---|---|---|---|---|---|
| | | TRSD | HPE | Model | TRSD | HPE | Model |
| | Software | | | | $ - | | $ 5,100 |
| Supplies, books, materials | Texts, consumables, classroom sets | | | | $ 8,878 | $ 11,253 | $ 20,400 |
| | Classroom materials & equipment | | | | $ 15,352 | $ 11,946 | $ 38,420 |
| | Copying | | | | $ 11,032 | $ 2,360 | $ 8,568 |
| | Media center materials | | | | $ 1,643 | $ 4,720 | $ 4,080 |
| | Teacher reimbursement of materials purchases | | | | $ - | | $ 3,400 |
| Professional training & development | 10 days | 0.00 | 0.00 | 22.50 | $ 6,836 | $ 7,000 | $ 45,000 |
| | Materials, Travel, | | | | $ - | | $ 4,950 |
| | Consultants | | | | | | |
| | Support staff-10 days | | | | $ - | | $ 2,500 |
| Additional instructional time for students to achieve standards | Certified | | | | $ - | $ - | $ 12,600 |
| | Classified | | | | $ - | $ - | $ 1,500 |
| | Supplies | | | | $ - | | $ 1,200 |
| Centralized support costs: Centralized costs distributed to each building | Food services | | | | $ - | $ - | $ - |
| | Student transportation | | | | $ 163,212 | $ 134,692 | $ 81,940 |

# Quality Education Model

**TRSD=Three Rivers School District Elementary School: 336 Students**

**HPE=Hudson Park Elementary School in Rainier School District: 345 Students**

**Model=Quality Education Model Prototype Elementary School: 340 Students**

| Program Element: | Component | FTE | | | Element Cost | | |
|---|---|---|---|---|---|---|---|
| | | TRSD | HPE | Model | TRSD | HPE | Model |
| | Technology services | | | | $ 16,632 | $ 24,243 | $ 32,300 |
| | Operation, plant maintenance | | | | $ 167,849 | $ 172,344 | $ 136,680 |
| | Other support services | | | | $ 11,320 | $ 12,861 | $ 20,060 |
| | Centralized special education | | | | $ 27,495 | $ 35,683 | $ 35,700 |
| District administrative overhead | Executive administration: Board of Education, superintendent | | | | $ 8,881 | $ 56,266 | $ 20,740 |
| | Business & Fiscal Services | | | | $ 22,452 | $ 17,745 | $ 24,140 |
| | Personnel Services | | | | $ 14,724 | $ 17,745 | $ 21,760 |
| | Public Information | | | | $ - | | $ 4,080 |
| **Total school cost:** | | | | | **$1,587,268** | **$1,685,182** | **$2,082,483** |
| **Total per pupil cost (not comparable to ADMw)** | | | | | **$4,724** | **$4,885** | **$6,125** |