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ABSTRACT

This chapter of "Principles of School Business Management" focuses on financing and managing transportation services for average and exceptional students. The chapter opens with a brief overview of the history of the development of transportation services and public responsibility for their provision. Current state funding models used to support pupil transportation are then reviewed. These models include reimbursement for actual or approved district expenditures, budget models, density formulas, fixed unit cost formulas, and the unique plans used by Hawaii and South Carolina. Eligibility requirements for regulating disbursement of state funds are also described. The chapter then turns to the transportation of exceptional students. Costs on a statewide basis, factors affecting costs for district programs, and recommendations for cost efficiency are considered. The management of pupil transportation is the chapter's next topic, with particular attention paid to personnel problems, the use of quality circles for problem-solving, and the use of computers for management purposes. Arguments for and against the use of seat belts in school buses are examined next. The chapter concludes by reviewing several current issues in the field and assessing trends that could affect the future. Six tables are provided, and 85 footnotes cite relevant sources. (PGD)

Public School Transportation: State Aid and Current Issues

Patricia Anthony and Deborah Inman

Antecedent to the Present System

Public school transportation has been a part of the American school scene since earliest times. During the seventeenth and eighteenth centuries, school transportation was furnished privately; family-owned horses and wagons were the main purveyors of transportation to and from school.[1]

By the latter half of the nineteenth century, the combined effect of two educational phenomena served to shift the responsibility for pupil transportation away from the parents and onto the shoulders of the local school district. Enactment of compulsory attendence laws boosted school enrollment figures, creating the need for additional facilities. During the early stages of compulsory education, one-room schoolhouses dotted the countryside as an answer to the educational needs of rural students. It soon became apparent that it was not financially feasible, nor educationally practical, to build a school within walking distance of every child. This recognition provided the impetus for a second educational phenomenon, consolidation. Featherston and Culp cited two reasons for the consolidation movement:

> This was caused in part by the fact that the rural population . . . began to decline. It was owing even more to the fact that the school program was changing in character, so that offering in the small school the kind of education which most parents wanted for their children was no longer economically feasible.[2]

At its peak, the consolidation movement was responsible for 20,000 small schools either being closed or converted into larger, more centralized facilities.[3] Increased awareness of the importance of secondary education added momentum to the consolidation movement and intensified the need for publicly funded school transportation.[4] With the construction of large comprehensive high schools came the need to transport students to the facilities from outlying rural areas.

Two reasons contributing to the acceptance of tax-supported pupil transportation programs were advanced by Johns: 1) "The good business sense of the American people," i.e., what many could do alone inefficiently, the community could do as a whole more efficiently; and 2) the faith of the American farmer that his children would be afforded the same educational opportunity as their wealthier urban counterparts.[5]

Early Legislation

In 1869, the first state law authorizing the use of local tax moneys for public school transportation was passed in Massachusetts.[6] Other states soon followed,

enacting their own statutes. By 1900, eighteen states had passed laws which allocated public funds for school transportation, and "$14,514,544 was being spent to transport 356,401 pupils."[7] Twenty-mile bus routes, common in many states today, were impossible in the late nineteenth and early twentieth centuries.[8] The automobile had the effect of increasing "from twenty-five to forty-five times the possible area that may be served by one school."[9]

The rapid growth of the automobile industry (during the 1920s, 17,292,838 vehicles were registered) created a demand for better road surfaces. Estimates provided by the United States Bureau of Public Roads reveal that "of the approximately 2 million miles of rural highways in use in 1890 only 100,000 miles had any kind of all-weather surface, which was gravel or crushed stone or less durable materials."[10] Improved road conditions escalated the growth of school transportation programs. In 1922, there existed 387,000 miles of all-weather surface rural roads. During the same year, 594,000 students were transported by local school districts. By 1960, the number of all-weather surface roads had risen to 2,557,000 and the number of students provided transportation climbed to 12,700,989.[11]

The increasing demand for pupil transportation prompted administrative interest in developing regulations and uniformity. Minimum distances between school and a student's residence were set, so as to determine which pupils needed to be transported. Excessive mileage was decreased by more efficient routing of buses. Regulations governing maintenance and operations took effect.

In accordance with the increased use of motorized vehicles for transporting children, national uniformity measures involving safety and school bus standards were introduced at a 1939 national conference. Subsequent conferences resulted in the revision and strengthening of such standards. Uniformity in state traffic laws was achieved by the late 1940s.[12]

Expanded Role of School Transportation

In the latter decades of the twentieth century, public school transportation has taken on new dimensions. As one method for achieving racial desegregation, intra-district busing of both black and white students was augmented during the early 1970s. In the landmark decision *Swann v. Charlotte-Mecklenburg*, Chief Justice Burger declared, "desegregation plans cannot be limited to the walk-in school."[14] This Supreme Court ruling gave birth to a new social phenomenon, "busing," by which the common public school bus became a tool against segregation.

School buses have also been used to transport students to and from athletic events, as well as field trips and other scholastic events. Most recently, school buses have been adapted or special school buses ordered to enable handicapped students to attend educational programs in accordance with federal legislation. The assumption of this multi-dimensional role by public school transportation has impacted greatly the resources and operations of local district programs, making mandatory the reassessment of existing state pupil transportation funding models and the refinement of local management procedures.

Escalation of Costs

The multi-dimensional role of pupil transportation, coupled with an increase in number of students transported, has contributed to a continual rise in costs. In 19[illegible] enditures for public school transportation in the United States stood

at $54,823,000.[13] Current figures show that fifty-eight percent of all elementary and secondary students nationwide are transported at the cost of $3.3 billion.[16] While the overall cost of public school transportation has increased, state allocations to school districts have not always kept pace. Florida is a case in point. For the 1973-74 school year, state monies funded 61 percent of all Florida public school transportation at a cost of $21,050,092. By the 1983-84 school year, district pupil transportation costs had risen to $185,587,784 and state appropriations, although approximately four times the amount allocated ten years earlier, funded only forty-five percent of total pupil transportation costs state wide.[17] Such disparities between state allocation and actual district costs emphasize the need for: 1) adoption of fiscally sound state level funding models, and 2) increased emphasis upon efficiently operated local pupil transportation programs.

State Pupil Transportation Funding Models

Every state, with the exception of New Hampshire, allocates state moneys for local district pupil transportation programs. Individualized funding models vary from state to state, but generally can be categorized according to one of four types: 1) actual or approved district expenditures, 2) budget models, 3) density formulas or 4) fixed unit cost formulas.[18]

Table 15:1 outlines the funding models currently utilized by each of the states. In the following section, each of the four funding models is discussed and examples of salient features are drawn from states which have adopted a specific type of funding model.

Table 15:1 State Pupil Transportation Funding Model

State	Actual/Approval District Expenditures	Budget Models	Density Formulas	Fixed Unit Cost Formulas
Alabama			x	
Alaska		x		
Arizona				x
Arkansas			x	
California	x			
Colorado				x
Connecticut	x			
Delaware		x		
Florida			x	
Georgia		x		
Hawaii[a]				
Idaho	x			
Illinois	x			
Indiana			x	
Iowa				x
Kansas			x	
Kentucky			x	
Louisiana		x		
Maine	x			
Maryland		x		
Massachusetts	x			
Michigan	x			
Minnesota			x	
Mississippi			x	
Missouri			x	
Montana			x	
Nebraska			x	
Nevada	x			
New Hampshire[b]				
New Jersey	x			
New Mexico		x		
New York	x			
North Carolina		x		
North Dakota				x
Ohio				x
Oklahoma			x	
Oregon	x			
Pennsylvania	x			
Rhode Island	x			
South Carolina[a]				
South Dakota	x			
Tennessee				x
Texas			x	
Utah			x	
Vermont	x			
Virginia				x
Washington				x
West Virginia	x			
Wisconsin				x
Wyoming	x			

[a]Pupil Transportation program owned and operated by the state
[b]No state pupil transportation funding model

Source: Thomas Melcher, "State Pupil Transporation Programs," in *Perspectives in State School Support Programs*, eds. K. Forbis Jordan & Nelda Cambron-McCabe (Cambridge, Massachusetts: Ballinger, 1981).

Actual or Approved District Expenditures

Seventeen states reimburse local school districts for actual or approved expenditures.[19] The percentage of local district costs reimbursed by the states varies, as do the criteria for reimbursement. Both New York and New Jersey reimburse ninety percent of approved local district cost; however, New Jersey bases its funding upon the cost of approved bus routes, while New York categorically funds ninety percent of approved costs through its basic state school finance program. Nevada and Idaho also reimburse a specific percentage of approved pupil transportation costs (eighty-five percent) through their state foundation programs.

Two states reimburse a percentage of actual costs, rather than approved costs.[20] In Wyoming, seventy-five percent of actual pupil transportation costs are reimbursed through the state foundation program; while West Virginia reimburses local school districts for eighty percent of operating costs and provides additional funds for bus driver salaries. A bus depreciation allowance is also included in the overall pupil transportation funding.

In several states, local district reimbursement is provided by deducting a percentage from the total actual or approved costs.[21] Prior year expenditures are used as the basis for reimbursing costs in California and Maine. In California, where a state-wide average cost for operating a bus per day has been determined, there are sixteen different bus classifications based upon: 1) bus capacity and 2) the numbers of hours in operation. To this average cost for operation of a specific bus, twenty-five percent is added, resulting in a local district's approved expenditures. These total expenditures for the prior year, minus a qualifying amount, become a local district's reimbursement.[22] In Maine, on the other hand, the second prior year is utilized as the basis for reimbursement. One hundred percent of these second prior year expenses are paid by state allocation.

Both Massachusetts and Illinois reimburse 100 percent of pupil transportation costs, less a qualifying amount.[23] Massachusetts deducts five dollars per transported student, while Illinois deducts whichever is greater—sixteen dollars or a qualifying amount.

Connecticut, Rhode Island and Vermont fund pupil transportation programs through the state-percentage-equalizing plan.[24] By funding their transportation programs through the state plans, local districts in Rhode Island and Vermont are allocated moneys inversely, according to district wealth per student. In Connecticut, districts are reimbursed for twenty to sixty percent of their transportation costs according to district wealth.

Budget Models

Detailed budget models are used by seven states to fund approved district pupil transportation costs.[25] With this type of model, the state analyzes the costs involved in operating individual pupil transportation programs, with regard to such items as bus driver salaries, buses and maintenance, and then sets fixed reimbursement levels for these costs. Any district which incurs higher expenses than state approved costs must make up the difference with local funds.

An example of the budget approach to funding pupil transportation is the state of Georgia. The costs for driver salaries, bus insurance, vehicle replacement, operating expenditures and fuel price increases are determined for each district, then appropriate levels of state reimbursement for each of these expenses are set.

Density Formulas

Density formulas are utilized by twelve states in funding district pupil transportation programs.[26] An additional state, Minnesota, includes area density as one of the factors used to determine its state allocations for pupil transportation.

Density formulas are based on either area or linear density and provide an adjustment of the costs incurred by a school district due to sparsity. Area density is calculated by dividing the number of students transported by the square mile area of the district, while linear density is determined by dividing the number of pupils transported by the number of bus route miles.

An Area Density Model. In Kentucky, the relationship between area density and cost is used to ascertain the appropriate level of state funding. First, mileage of areas not served is subtracted from the school district's total square mileage. Average daily attendance is then determined, as is density per square mile. Cost per pupil transported is determined by adding all transportation costs involved, and then divided by the number of students transported and the number of days.[27]

A curve of best fit is attained by plotting costs per pupil per day against density per square mile. The point of intersection of these two variables determines individual district allocations based upon a district's standing within one of nine density categories. These categories were constructed in accordance with state statute as a method to depict "the average costs of transportation for districts having similar density."[28] Density categories range from a group encompassing sparsely populated districts with an average density of 3.4, to one which includes densely populated districts averaging 47.8 students per square mile.[29]

A Linear Density Model. Linear density is the basis of the pupil transportation funding model for the state of Florida. A density index for each district is computed by dividing the total number of transported students by the total number of allowable vehicle miles. The derived density index is then included in formula calculations to determine the level of funding for each district. Maximum and minimum limits have been set by state statute regarding the use of the density index. Districts with a density index below 1.7 use 1.7 in computing the state formula, while districts with a density index above 4.7 must utilize that figure in their computations. An example of the Florida Pupil Transportation funding model and the effect of density upon cost per student is shown in Table 15:2.

Similar to the Kentucky model, a curve of best fit is generated from which the predicted cost of each district's pupil transportation program is determined. Local funds make up the difference between actual and predicted costs.

Both types of density formula models are efficiency-oriented models, in that districts which transport students economically are rewarded and less local funding is necessary to underwrite the pupil transportation program. Districts which are inefficient in operating transportation programs must contribute larger amounts of local moneys to their programs. The effect of inefficiency upon the cost of a pupil transportation program is depicted in Table 15:3.

Fixed Unit Cost Formula

The use of fixed unit cost formulas for funding district pupil transportation programs has been adopted by eleven states.[30] With this method, a particular level of support is affixed to a unit of need such as bus mileage or students transported.

In North Dakota, both a specific amount per pupil and per mile are utilized in funding programs. Virginia divides its support among three units of need: 1) pupils transported—forty percent, 2) mileage—forty percent, and 3) number of buses in daily use—twenty percent.

The fixed unit of cost in the Washington model is a weighted student/mile unit.[31] There are five different weighting factors employed for allocating pupil transportation funds.

TABLE 15:2 The Effect Of The Density Index Upon State Allocation In District A

Vehicle miles with Students	Vehicle miles Without Students	Vehicle miles Nonessential*	Total membership Transported Students
6,000	2,500	1,500	10,500

6000 2500
x .50 x .25
3000 + 625 = 3625 miles

$\frac{10500}{3625}$ = 2.89 (density index)

Cost per student = $\frac{386.2385^a}{2.89}$ + 42.50283[a]

Cost per student = 133.64 + 42.50283
District A's cost per student = $176.15

10,000	3,000	2,225	10,500

10000 3000
x .50 x .25
5000 + 750 = 5750 miles

$\frac{10500}{5750}$ = 1.83 (density index)

Cost per student = $\frac{386.2385^a}{1.83}$ + 42.50283[a]

Cost per student = $211.06 + 42.50283
District B's cost per student = $253.56

*Does not enter into this section of the calculations
[a]Constants set annually by the State Department of Education.

FIGURE 15:3 The Effect of Inefficiency Upon Cost of District Pupil Transportation Program In District A

Vehicle miles with Students	Vehicle miles Without Students	Vehicle miles Nonessential	Total membership Transported Students
5,000	2,000	1,000	8,000

5000 2000
x .50 x .25
2500 + 500 = 3000 miles

$\frac{8000}{3000}$ = 2.66 (density index)

$\frac{386.2385^a}{2.66}$ + 42.50283[a] = $187.70

Cost per student = $187.70 Total State Allocation = $1,501,600[b]
8000 miles[c] X 180 days = 1,440,000 X 1.00[d] = $1,440,000
Prorated state allocation (45% X 1,501,600) = $675,720
Local funds needed to fund district program = $764,280

5,000	2,000	1,500	8,000

5000 2000
x .50 x .25
2500 + 500 = 3000

$\frac{8000}{3000}$ = 2.66 (density index)

$\frac{386.2385^a}{2.66}$ + 42.50283[a] = $187.70

Cost per student = $187.70 Total State Allocation = $1,501,600[b]
8500 miles[c] X 180 days = 1,530,000 X 1.15[d] = $1,759,500
Prorated state allocation (45% X 1,501,600) = $675,720
Local funds needed to fund district program = $1,083,780

[a]Constants set annually by the State Department of Education
[b]Unprorated
[c]Essential miles + nonessential miles
[d]District's cost per mile

1. *Base Rate*. A standard rate per allotted weighted student/mile is applied to all districts. Initially, in 1980-81, a base rate of $22 was allocated per weighted student/mile, to be increased each succeeding year according to inflationary demands.

2. *Restricted Student Load Factor*. A second weighting factor is allotted to districts, for which sparsity is a cost factor. Several districts have a small population dispersed over a large geographical area, and consequently, are unable to operate at an acceptable level of efficiency. Through the use of a fact-finding review panel and local busload data, districts which require this additional factor are determined. If the average busload is below the state minimum busload, then the districts are permitted to utilize the state minimum busload standard in their costs, rather than their actual busload average. This procedure compensates districts with a sparsity factor.

3. *Handicapped Student Load Factor*. In the transportation of handicapped students, different weighting factors are assigned according to busload. Weighting factors vary from 10:1 to 0 depending upon how many students are transported per bus. The lower the number of handicapped students transported, the higher the weighting factor. For example, if an average load for a particular handicapped bus is 1-3 students, then a weighting of 10 would be applied to that bus.

4. *Bus Maintenance Factor*. For districts which experience extraordinary maintenance costs due to heavy staffing needs for small bus fleets, or additional maintenance costs because of poor road conditions, a fourth weighting factor can be applied. Local districts qualifying for this factor must submit to a state audit in order to prove that additional funding is necessary to cover costs arising from conditions beyond a district's control.

5. *Climate and Terrain Factor*. An extra dollar rate is provided to districts which have abnormal weather conditions or must utilize routes which transverse difficult terrain to transport students. In some school districts, aircraft, boats or four-wheel drive vehicles are used in transporting students. Again, as in previous cases, in order to qualify for this type of weighting factor, a fact-finding review panel determines need.

Unique Reimbursement Plans

Hawaii and South Carolina have financing plans sufficiently different from other states so as to be judged unique. Hawaii is the only state which practices full state funding. This is due to the fact that Hawaii has no local school districts. Therefore, transportation is contracted to private businesses, the lowest bid being awarded the transportation contract.

A different case exists in South Carolina. The State Board of Education owns and operates all school buses. Maintenance and operational costs are paid for by the state board. Costs incurred by the local districts in supervising the routing and organizing of students needing transportation are reimbursed by funds appropriated by the legislature.

Eligibility Requirements

...o provide equitable support to individual school districts, many states

have developed eligibility requirements for regulating the disbursement of state aid for pupil transportation. Minimum distance mileage, handicapped student designation and hazardous walking conditions have been included within state eligibility requirements.

Minimum travel distance requirements vary in accordance with population. States in which there are large tracts of sparsely populated areas tend to have larger mileage minimums. For example, Nebraska utilizes a four-mile minimum; Kansas and South Dakota each have the requirement that a student must live beyond two and one-half miles from school to be eligible for public pupil transportation.[32] Generally, most states with minimum distance requirements favor one to two miles between home and school as a minimum.

Identification of a student as handicapped may constitute eligibility for school transportation regardless of travel distance. Individual state regulations outline which handicaps necessitate special transportation. In the majority of cases, handicapped students are transported with regular students, without any special considerations. These students generally are categorized as learning disabled, educable mentally retarded or mildly emotionally disturbed. Categories requiring special transportation are: 1) physically handicapped, 2) severely/profound/mentally handicapped, 3) trainable mentally retarded and 4) moderately/severely emotionally disturbed.[33]

Hazardous walking conditions is a relatively new category necessitating the waiver of minimum travel distance requirements. Dangerous intersections, the presence of highways or busy thoroughfares within a school's neighborhood and the absence of sidewalks may qualify as hazardous conditions.

Additional factors cited by states as reasons for state reimbursement of transportation are: 1) nonpassenger miles due to a) vehicular inspection, b) maintenance-incurred mileage, c) mandatory bus driver training, or d) mileage between school and storage facility; and 2) transportation between schools for basic programs, gifted education or vocational courses.

Transportation of Exceptional Students

In 1975, the Education for All Handicapped Children Act, frequently referred to as P.L. 94-142, was passed by Congress. Prior to 1976, less than one half the handicapped children in the United States received appropriate educational services, and at least one million were not enrolled in any puplic school program.

By the 1980-81 school year, the number of handicapped children receiving services rose thirteen percent over the number served in 1976, with approximately 500,000 students identified as requiring special education programs.[34] This influx of handicapped students into the public school system escalated education expenditures and placed an immediate financial burden upon the individual states, which were required to undertake the major responsibility of financing these programs. During the 1980-81 school year, an estimated ten billion dollars were spent nationwide on special education services.[35] One such service requiring prompt implementation was the establishment of alternative school transportation programs for students, who because of the severity of their handicaps were unable to be transported on regular schoolbuses.

Cost of Special Transportation

Special transportation of handicapped students is more expensive than regular, nonhandicapped student transportation. During the 1977-78 school year, nationwide per pupil transportation costs for a nonhandicapped student averaged $73, while the cost of transporting a handicapped student was $159, more than two times the cost of regular transportation.[36] Recent state figures reveal an even higher cost differential between regular and special transportation.

During the 1981-82 school year, the state of North Carolina spent $125.41 per handicapped pupil when transported by regular transportation, as opposed to $511.64 per handicapped student when transported by special vehicles.[37] The cost of special transportation was four times greater than that of regular transportation. Special transportation in North Carolina further escalated in cost when it was provided on a contractual basis. During the 1981-82 school year, 2,658 handicapped students were transported by contractual services at an average cost of $952 per student. This figure is roughly seven and one-half times greater than the cost of regular transportation.[38]

Illinois experienced similar cost ratios. According to 1981-82 transportation claim statistics, the state of Illinois spent on the average four and one-half times more to transport handicapped students than it did to transport students by regular transportation.[39] Similarly, during the 1982-83 school year, the state of Louisiana transported 12,330 handicapped students at an average cost per student of $773. This figure was four and one-half times greater than the $166.37 which was the average cost per regular student transported.[40]

Significantly higher cost in providing special transportation services for handicapped students were incurred by the state of Virginia. In a 1983 report to the Governor and General Assembly, a joint subcommittee examining the issue of increased funding for handicapped transportation, reported that the ratio of costs between special transportation and regular transportation was 9.69:1.[41] Arizona reported a similar ratio of cost figures existing between special and regular transportation.[42]

In several states, the cost of special transportation is unknown. A 1984 study undertaken to determine individual states' total expenditures for special transportation revealed that of the fifty states, fifteen were unable to supply a total cost figure for special transportation.[43] This was due to either current state reporting procedures or the type of pupil transportation funding model used. In the case of the latter it was not possible to separate special transportation costs from overall transportation costs. Table 15:4 provides state 1982-83 school year expenditures for special transportation.

Table 15:4 Total State Expenditures for Special Transportation Services, School Year 1982-83

State	Cost	State	Cost
Alabama[a]		Montana	$ 745,605
Alaska	$ 2,252,442	Nebraska	$ 5,842,110
Arizona	10:1 ratio with regular costs	Nevada[b]	
Arkansas[b]		New Hampshire	$ 1,894,605
California	$ 107,000,000	New Jersey	$ 40,000,000
Colorado[a]		New Mexico[b]	
Connecticut[a]		New York	$ 170,200,000
Delaware	$ 3,416,000	North Carolina	$ 10,981,578
Florida[b]		North Dakota[b]	
Georgia	$ 10,603,538	Ohio[b]	
Hawaii	$ 3,715,470	Oklahoma[b]	
Idaho[b]		Oregon[b]	
Illinois	$ 64,315,412.42	Pennsylvania	$ 40,000,000
Indiana	$ 5,045,018	Rhode Island	$ 5,724,076
Iowa[b]		South Carolina	$ 4,693,447
Kansas	$ 9,700,872	South Dakota	$ 1,050,729
Kentucky	$ 7,600,000	Tennessee	$ 4,560,241.28
Louisiana	$ 857,685	Texas	$ 22,022,337
Maine[b]		Utah	$ 18,975,000
Maryland[b]		Vermont	$ 1,166,863
Massachusetts[a]		Virginia[b]	
Michigan	$ 55,015,705	Washington[b]	
Minnesota[a]		West Virginia[a]	
Mississippi	$ 1,000,000	Wisconsin	$ 14,387,479
Missouri	$ 10,265,849.28	Wyoming[b]	

[a]Did not reply to study's survey.
[b]Cost of special transportation unknown.

Factors Affecting the Cost of Special Transportation

There are several characteristics of education for handicapped students which generate higher costs for special transportation. They are: 1) the number of handicapped students with a particular handicap being served within a school district, 2) severity of handicap, 3) location of programs, and 4) inefficiency in management and operation procedures.

Number of Handicapped Students Within a Particular Handicap. Several of the handicapping conditions involve small numbers of students. In order to provide educational services for these students at a cost-efficient level, centralized programs are developed to which the students are transported daily. Often, special centers for specific handicaps, such as severely/profoundly mentally retarded, serve students from three or four school districts. Rural areas are particularly hard-pressed in providing educational programs at the district level, due to sparsity of students. In many areas, handicapped students must spend up to four hours a day in total traveling time. Door-to-door service mandated by IEPs require special transportation vehicles to traverse entire counties in order to transport two or three students.[44] The increased mileage incurred by special transportation results in higher fuel, maintenance and salary costs.[45]

Severity of Handicap. The cost for special transportation escalates as the educational placement of a handicapped student becomes more restrictive. For example, there are no special transportation costs incurred by learning disabled students because those students are educated in the regular classroom and are transported on regular buses. In contrast, the average cost per pupil for special transportation for a multiple handicapped student in 1977-78 was $980.42.[46] Due to the severity of their handicaps, these students are typically found in special day schools or full-time special classes. Table 15:5 lists the transportation costs for the six handicaps most likely to necessitate special transportation according to disability and placement and illustrates that, generally, the more restrictive the educational environment, the more costly the transportation.

Table 15:5 Additional Transportation Costs Incurred According to Student Placement

Handicap	Placement		
	Regular Classroom	Full-time Special Class	Special Day School
TMR	$ 0	$324	$685
Emotional	$ 0	$467	$584
Deaf	$ 0	$554	$143
Blind	$ 0	$321	$685
Physical Handicap	$272	$415	$323
Profound	$ 0	$561	$1271

NOTE: From J. J. Kakalik, W. S. Furry, M. A. Thomas, and M. F. Carney, *The Cost of Special Education* (Santa Monica, California: The Rand Corporation, 1981).

Students who have been identified as trainable, severely or profoundly mentally retarded do not possess the intellectual skills required for mainstreaming into regular programs or independent traveling on regular school buses. Mentally retarded students in the moderate to profound range are unable to pick up cues from the environment and respond accordingly; hence, the necessity for special classes and special transportation which assure safe delivery of the student from one caretaker to another.

Physically handicapped, severely emotionally disturbed and profoundly handicapped students, by the nature of their disabilities, require extensive adaptive equipment not found on standard school buses. In order to accommodate these students, school districts must provide vehicles equipped with lifts or ramps, as well as restraints, handrails and additional maneuvering space. Vans or minibuses are viewed as the most acceptable vehicle for wheelchair use.[47]

The importance of passenger restraining devices is emphasized by school transportation supervisors. For students who are under forty pounds in body weight, car seats are a safe alternative to a wheelchair.[48] In the event that the child is too large for a car seat, but too small for a wheelchair, special chest harnesses can be attached to rings secured to the bus seats for this purpose.

With severely or profoundly handicapped students, paraprofessionals are often employed to travel with the children to and from school. In a 1982 survey, it was reported that twenty states currently use paraprofessionals in transporting handicapped students. Paraprofessionals 1) aid in maintaining appropriate behavior, 2) ensure all essential safety precautions are observed and 3) are able to take immediate action in the event of a medical crisis.[49]

Locations of Programs. The location of local district exceptional education programs often determines the type of transportation required for handicapped students. Prior to 1970, most handicapped children were educated in classrooms designated for their particular disability. With the passage of federal legislation in 1975, "A major change in programming was noted with the movement away from special classes for children with mild or moderate handicaps toward the integration of these children into regular classes."[50] In fact, "all but thirteen percent of the special education students spent at least part of the day in a regular program with nonhandicapped children."[51]

However, the location of exceptional education programs within regular public schools does not negate the need for special transportation. Trainable mentally retarded, severely emotionally disturbed, physically handicapped and profoundly handicapped still require special transportation due to their disabilities. Hearing impaired and visually handicapped students who are able to travel on regular buses to school may require alternate transportation for either of two reasons: the sparsity of students requiring the program or Individual Education Placement (IEP) program selection.

As discussed previously, school districts, particularly sparsely populated rural communities, often lack a large enough population of handicapped students to fund an exceptional education program. Pursuant to state statutes one alternative for these districts is to transport handicapped students to adjacent school districts.

Selection of a particular program by an IEP committee also affects the transportation needs of exceptional children. The IEP process determines what type of placement is most suitable for each child. If the program selected is located out of the student's immediate neighborhood, special transportation will be necessary. Consequently, handicapped students, who are mentally and physically capable of riding regular school buses, are forced to use the more expensive special transportation in order to reach their educational programs.

Management and Operational Inefficiencies. To further compound the existing costliness of special transportation due to small numbers of students, severity of

handicap and IEP-designated location of program, a fourth factor responsible for escalating costs may be, in some instances, inefficient management procedures.

In a recent transportation study analyzing the efficiency of using the state-adopted density formula for allocating special transportation funds to Florida school districts, it was determined that while density explained seventy-four percent of the costs per regular student transported, it explained only thirty-six percent of the costs involved in special transportation.[52] Furthermore, when individual school districts were compared, it was discovered that in some cases, school districts with similar demographic and geographic features engendered vastly different special transportation costs. Aside from excessive fuel expense and poor utilization of transportation vehicles, other possible areas to be examined are excessive salaries, inadequate use of personnel and unnecessary mileage and maintenance expenses due to inattention to cost-efficient routing.

Recommendations for Cost-Efficient Practices

The costliness of special transportation has prompted many states to reevaluate current pupil transportation programs and to develop recommendations outlining cost-efficient management procedures for transporting handicapped students. Five areas currently under review are: 1) alternative transportation plans, 2) funding incentives, 3) eligibility requirements, 4) personnel responsibilities and 5) general cost-reducing operating procedures.

Alternative Transportation Plans. Door-to-door pickup of handicapped students is the most expensive type of special transportation, and in many cases, the most unnecessary. Door-to-door service should only be used with the most severely handicapped students, "whose handicaps preclude all other forms of transportation."[53] Students requiring door-to-door service are multiple-handicapped students, profoundly mentally retarded students or students whose individual handicaps are so severe that they cannot be transported safely by private car to a pickup station (i.e., a central location, to which students are transported by parents). Eligibility for door-to-door pickup should be assessed on an individual basis.

Where sound risk management practice and state statute allow, one type of alternative transportation which effectively reduces the cost of transporting handicapped students is parent transportation. In this case, parents are paid a flat rate per mile (.18 to .22) for transporting their handicapped child. Procedures to be followed for reimbursing parents should include the following information: 1) the allowable rate, 2) procedure for claiming reimbursement and 3) information required of parents in order to be reimbursed (names of children, dates they were transported, mileage). When permitted by statutes, parent transportation can be an effective, cost-reducing practice in states which have large rural populations.

Other forms of alternative transportation utilized by school districts are contracts with private companies, such as taxicab or special transportation companies. In these cases, it has been determined that providing district-owned transportation for handicapped students is considerably more expensive.

When permissable, private cars can also be used for transporting high school educable mentally retarded students from a school program to a place of employment. When students are involved in work-study programs, the use of district schoolbuses to transport individual students is not a cost-effective method of transportation. In cases where private vehicles are used for transporting handicapped students, policies covering insurance and liability requirements must be in effect.

Funding Incentives. Several state departments of education have recommended funding incentives to encourage school districts to practice cost-efficient methods of transporting handicapped students. A California Ad Hoc Committee on Transportation Finances offered several recommendations, which would have the two-fold effect of implementing more efficient and cost-reducing means of transporting handicapped students, while providing financial incentives to local school districts.[54] These recommendations are as follows:

1. Provide reimbursement for only the most severely handicapped students, who cannot be transported by regular schoolbuses.
2. Allow 100 percent reimbursement for handicapped student transportation when it is being provided by a single district for a multi-district area.
3. Revise the excess-cost formula used in calculating special education transportation, so that it is "determined on the basis of predominance of severely handicapped being transported and density of area served instead of the current basis type of vehicle and average daily hours of operation."[55]
4. Encourage county superintendents to be responsible for transportation of handicapped students countywide, rather than operating several local district programs. Countywide systems of transportation would be encouraged by: (a) equalizing bus replacement allowances from the state for regular and special education buses and (b) allowing county superintendents to levy a fee for every handicapped student transported.
5. Encourage the use of computerization for scheduling routing and managing changes of buses by establishing a revolving fund, which would enable school districts to draw out funds necessary for developing computer-based transportation systems. Districts would repay loans according to the amount of savings realized.

In Virginia, a 1983 joint subcommittee of the state legislature studying handicapped students' transportation costs also recommended that the current method for calculating special education transportation costs be revised. First, the committee suggested that separate reporting of transportation costs for handicapped and regular students be required. This would aid in determining specific items responsible for escalating costs. Second, the committee recommended that the board of education adopt regulations which would: 1) establish eligibility criteria for transporting handicapped students by exclusive scheduling; and 2) require that each school division submit, as a component of its annual pupil transportation funding report, documentation of cost effective measures undertaken during its regular route development process to improve the efficiency of its special education transportation program, or provide justification for maintaining its current arrangements as a prerequisite for receiving supplemental aid for the exclusive scheduling of handicapped students for succeeding years.

Third, the committee advocated that current statutes be amended to include two cost-reducing recommendations. First, local school districts should be able to allot funds for payment of transportation of handicapped students by means other than district-owned buses. Second, the existing formula should be revised so that it is based upon the number of handicapped students transported, buses in use and miles traveled; and local districts are reimbursed for only the approved costs involved in transporting the more severely handicapped students.[56]

Eligibility Requirements. Explicit eligibility regulations identifying which handicapped students require special transportation are of primary importance in trimming pupil transportation budgets. In the majority of cases, handicapped students should ride regular school buses; only the more severely handicapped student requires special transportation.

Several states have adopted regulations which require documentation from school districts for students transported by buses serving exclusively handicapped children. Door-to-door service is discouraged except for the severely handicapped; even then, pickup stations are recommended except in cases where the nature of the handicap warrants such individual service. Some states require written permission to transport non-severely handicapped students.

Utah reimburses school districts for costs involved in transporting trainable mentally retarded, severely motor handicapped and severely multiple-handicapped, as well as students attending the state school for the deaf and blind. If other types of handicapped students must be transported by a means other than the regular school bus, prior approval from the state department of education must be received in order to be reimbursed.[57]

Personnel Responsibilities. An area which indirectly affects special transportation costs is personnel responsibilities. Unclear division of responsibility leads to mismanagement, unenforcement of procedures and an escalation of costs.

In several states, responsibilities of school administrators, transportation supervisors and route managers, bus drivers, aides and parents are clearly stated, either in policy statements, handbooks or the state education regulations. The New Mexico State Department of Education publishes a handbook for bus drivers which not only outlines the qualifications necessary for driving special transportation vehicles, but also describes the responsibilities of school administrators, parents and aides.[58] Louisiana has issued a similar handbook, while Florida has provided through a question/answer format, information concerning: 1) handicapped students and evacuation drills, 2) driver training, 3) techniques and procedures for dealing with unmanageable handicapped students and 4) allowable travel time spent in transporting handicapped students to and from school.

Parents' responsibilities are outlined by several states, in an effort to minimize expenses incurred when parents fail to notify transportation officials if their child is ill or will not be riding the special bus on a particular day. Failure to notify personnel results in unnecessary mileage.

In some instances, district-supplied transportation is not possible because of the inaccessible location of a student's home. These situations must be resolved, entailing the cooperation of both school personnel and parents. Clearly defined roles of leadership and responsibility expedite the resolution of such problems.

Other Cost-Reducing Operating Policies. In addition to the four areas discussed above are cost-reducing procedures which can be established and practiced at the local level. These include:

1. Adjusting school hours for various programs to facilitate scheduling and optimum use of transportation vehicles.
2. Filling buses to capacity.
3. Utilizing 65 passenger side-lift busses to transport rural handicapped students who live along regular routes, rather than invest in mini-buses or vans.

4. Having a representative from the pupil transportation division attend a handicapped students' IEP meetings, in order to advise committee members on the cost of various placements.

Management of Pupil Transportation

The management aspect of pupil transportation is critical and complex. This discussion will focus first on personnel problems faced by many transportation divisions and, second, on the uses of microcomputers in the management of school transportation.

Bus driver shortages are becoming a real problem for many school districts. Fewer males are applying to be bus drivers and those that do frequently plan the job as an interim only a short step to something else. Boston Public schools have experienced a severe problem with bus drivers having criminal records. In fact, a recent study found that over half of Boston's 575 school bus and van drivers had criminal records. Of these, ten percent had "serious court records." Due to the shortages they have experienced of late, the district is forced to accept some applicants with criminal records in order to comply with court ordered busing of 35,000 students.[59]

Quality Circles

Some districts are beginning to consider new programs and alternatives in an effort to avoid bus driver shortages. For example, school districts have introduced the concept of quality circles in their transportation department. Quality Circles as an approach to problem solving has been used successfully by industry in the United States since 1974 and in Japan since the early 1960s. The quality circle is a highly structured process in which a small group (usually five to ten people) meet regularly on a voluntary basis to work through 1) problem selection, 2) problem analysis, 3) solution selection and 4) presentation to management.

The problems addressed by quality circles are not restricted to quality but may include any area that influences the output of the work unit. This includes issues regarding safety, job structure, process flow, reporting requirements and control mechanisms. They do not, however, directly address personnel matters.

Management Uses of Computers in School Transportation

Administrative uses of computers are being introduced for a number of diverse applications in various departments of school districts. School transportation departments, being no exception, have found that implementation of computer technology can result in substantial savings of both time and money. In addition to such applications as word processing, personnel management and contract management, transportation departments use computers for school bus routing and scheduling.

Although the specifics of routing and scheduling vary from system to system, the following is an overview of the types of capabilities currently available in this area. Graphics systems provide a visual display of routes and allow for quick and easy determination of the effects of changing or combining routes and altering the

location and time of stops. By changing one variable, all information dependent on that variable is automatically changed and reflected in the route map. As changes are made in routes and pick-up locations, an updated list of student names, pick-up points and pick-up times can then be generated. This allows for easy continual revision, ensuring that the most efficient use of buses and bus routes is being made. Once routes and pick-up points have been established, a suitable pick-up location for a student may be provided simply by entering an address. The Milwaukee Public School system which put its computerized routing system into operation for the 1979-80 school year found that it paid for itself in the first year.

In spite of increased transportation costs on a per vehicle basis and a recognized inflation factor, transportation costs in dollars have decreased as follows:

1979/80—$14,789,874
1980/81—$14,577,098
1981/82—$13,836,716[60]

The decision to implement the computerized system in Milwaukee also resulted in the initiation of other policy changes which affected the efficiency of the transportation department. One such policy change was the decision to stagger school starting times, thus allowing the same bus to make two or three trips. Despite additional suburban schools being added to the routes, ". . . sixty fewer vehicles (were) used for the 1982 to 1983 school year than were used in the 1977 to 1978 school year, approximately ten percent less."[61]

Another important computer application in transportation is fleet maintenance. By maintaining files on each vehicle in a fleet and all transactions pertaining to that vehicle, a number of reports can be generated, concerning: 1) a summary of transactions pertaining to each vehicle as well as the entire fleet, 2) lists according to type of maintenance work performed, 3) yearly and/or cummulative histories of vehicles, 4) fuel consumption and 5) which vehicles are due to be checked (on the basis of mileage or time lasped). Such reports enable management to determine the effectiveness of the existing maintenance program and replacement date for vehicles. Additionally, inventories may be kept up-to-date regarding parts in stock, parts needing to be replaced, cost and so on.

Originally such applications required implementation on mainframe computers. A number of commercial software programs are now available for microcomputers, in addition to special transportation packages which have been privately developed for particular districts and tailored to specific needs.

A 1982 report prepared for the California Energy Commission regarding computerized pupil transportation systems in California found, "Successful implementation . . . for the San Francisco Unified School District and the Los Angles County Superintendent of Schools resulted in annual savings of $857,000. This system uses computer techniques to optimize bus fleet routing and scheduling, thereby reducing overall fleet travel time, fuel consumption and vehicle stock."[62] The findings report that "over one million gallons of motor fuel and twenty million dollars in capital and operating expenses could be saved annually in California, if computer management was applied to fleets of twenty or more buses. Payback on first costs was found to be one to two years."[63] The study concluded that using a computerized transportation system on fleets of thirty-three or more buses would result in statewide cost savings and energy conservation in excess of fourteen million dollars and 730,000 gallons per year. Although the districts identified by the

study claimed cost savings and energy conservation, the study team cautioned districts considering computerization that depending in the geographical area significant cost and development time could be greater than any potential savings. As emphasized by the study team, the unique transportation services required by an individual school district should dictate the computerized transportation system or combination of systems needed, whether it be for recordkeeping, computer-assisted bus scheduling, generating bus schedules, designing desegregation programs or servicing special educations pupils under the master plan.[64]

The report proposed the following criteria for consideration by potential adopters of computerized systems to make their transportation systems more energy efficient and cost effective.

Number of buses. The first criterion is the size of the bus fleet. A school district with two or three buses would find little advantage to computerizing their routing and scheduling.

Geographic factors. Urban districts with high density population and a wide variety of streets and highways are better candidates for computerization than a rural district with low density population and limited streets and highways.

Topography. Whether the terrain is mountainous, hilly, flat or contains natural barriers such as bodies of water and rivers, must be taken into consideration. Since routing and scheduling depends so much on maps, it is difficult to input such data into the computer.

Accessibility to computers. Not only must the computer capability be available to the district but the transportation department must receive a high priority for on-line use of the computer in a variety of hardware and software.

Total commitment. In order for a computerized routing schedule to work effectively, there should be broad community support, solid board and administrative backing and knowledgeable professional and technical staff assistance.[65]

Consideration Regarding Computerization

In order to determine the efficiency and effectiveness of computerizing the transportation program, several areas must be carefully evaluated. The first step is to conduct an appraisal of the district's transportation program. Second, examine a computerized transportation system in a similar district to determine problems encountered in the implementation process. The third step is planning, since proper planning can "eliminate eighty percent of the problems."[66] It is, of course, imperative to thoroughly evaluate the costs of implementing a computerized pupil transportation system during this planning stage. The major costs considerations are: 1) hardware and software, 2) installation, 3) regular maintenance, 4) adequate personnel, 5) staff training and 6) adequate workspace. Fourth, it is imperative that time be allocated in the early stages for proper staff training. Finally, it is recommended that the computerized programs be reviewed and evaluated annually. This is especially important with respect to scheduling and routing, since those programs need to reflect enrollment changes each year.

The primary factors influencing the impact of computerized transportation systems are: 1) size of bus fleet, 2) number of students transported, 3) geographic area which the fleet will operate (size and topography), 4) availability of computer services, (district owned versus service center) and 5) the way the computer sup-

port of transportation services relates to other management reporting systems.[67] The findings of the California report (1982) indicate the actual start-up costs will be influenced by: 1) size of computerized network, 2) number of intersections to be coded, 3) direct expense, 4) software lease, 5) professional services and 6) staff training need.[68]

Safety—The Seatbelt Issue

Twenty-three million children ride 350,000 school buses daily.[69] This translates into over fifty billion passenger miles each year.[70] The leading cause of death of children in the United States is the motor vehicle accident. The National Safety Council reports that for those between the ages of one and fourteen, traffic accidents claim more lives than cancer, congenital disease, pneumonia, drowning or fire. According to NSC, over half these highway deaths could be prevented if the children were properly "buckled up."[71]

To date 42 states and the District of Columbia have enacted child restraint legislation requiring the use of child safety seats for infants and seat belts or child restraints for older children. As a result, observational studies indicate a substantial increase in the use of child restraints, and motor vehicles statistics show a significant drop in fatalities. Encouraged by these very positive results, one state has now extended its laws to include children up to the age of ten, and others are considering similar proposals.[72]

It is evident that one cannot bypass the politics in any school-related issue. Many parents who use seat belts for their children in cars wonder why seat belts are not installed in school buses. As a result they are supporting organizations proposing mandated seat belts for school buses. Table 15:6 summarizes the pros and cons of the school bus/seat belt argument.

TABLE 15:6 Pros and Cons in the School Bus Seat Belt Issue

Pro	Cons
• Data proves that seat belts save lives	• School buses have the best safety record in transportation
• Kids who learn to buckle up on school buses will carry the habit over to automobiles	• Other measures, including compartmentalization and driver training are more cost effective than seat belts
• Studies on compartmentalization are not complete and need to be restructured	• Children will not wear their seat belts
• Studies that say seat belts hurt young bodies are not true	• Belts can harm young bodies
• New school bus design lends itself to seat belts	• Belts are too costly to install
• Younger parents grew up with seat belts and demand additional protection	• Buses are so large that they do not suffer damage in the same way an automobile does in a collision

Source: Rex, F.J., "Seat Belts in School Buses: A Study of Current Protective and Potential Action," *School Business Affairs* (April, 1985) 31.

What may seem clear-cut to some is complicated by such considerations as those below by the Department of Transportation and National Transportation Safety Board.

The U.S. Department of Transportation (DOT), in its July 1977 School Bus Vehicle Safety Report, warned that seat frames, seat anchorages and bus floors must be strengthened to support the leads imposed by belted occupants before belts could become a viable alternative. The report warned that seat belt usage in school buses could actually increase the severity of injuries to passengers in certain crash situations. It admitted, however, a lack of sufficient evidence to assess the general validity of these findings.[73]

The National Transportation Safety Board (NTSB) released a series of safety recommendations in its H-83-39 through 41 report that credited the Post-DOT bus with a satisfactory performance in the vast majority of school bus accidents. It stressed the necessity for a strong and continuing commitment to the education of pupil passengers in seat belt usage if they are installed but cautioned that justification for extending seat belts to the larger Type I buses is largely non-existent.[74]

Since the issue of seat belts has become somewhat political, it is not surprising that professional societies are playing a significant role. For example, The Physicians for Automotive Safety (PAS) is one of the more active proponents of seat belts on school buses. Dentists also support the stance taken by physicians.[75]

In reviewing studies conducted by Pupil Transportation Associations, Farmer found:

The California Association of School Transportation Officials (CASTO) conducted an exhaustive search of the literature for documented research on the subject. Its findings . . . were largely responsible for its decision to oppose seat belts for Type I school buses.

The Pennsylvania School Bus Association . . . introduced data to: 1) substantiate a decline in seat belt usage in automobiles, 2) support the fact that school buses experience fewer fatalities than any other mode of surface transportation, 3) confirm a continuing improvement in the safety image of the overall school bus operation, and 4) further validate its position against the installation of seat belts in the larger conventional and transit type vehicles.

The Tennessee Association of Pupil Transportation (TAPT) relied upon an impressive safety record to support its position against the use of seat belts on Type I school buses. The Association emphasized the fact that the state has not experienced an on-board fatality since 1977 and only one other since 1963; that personal injury accidents, on the average, occur no more frequently than every 597,557 miles; that injuries in these accidents requiring overnight confinement are experienced at 5,949,589 mile intervals; and that school buses travel 34,210,138 miles between accidents resulting in offboard fatalities.

The National Association for Pupil Transportation (NAPT) . . . stops short of endorsing the use of seat belts on Type I school buses. Ray Westmoreland,

then President of the NAPT, as quoted in 1984 issue of *School Bus Fleet*, said "There is no absolute proof that seat belts are the answer for the safety of students in school buses." He further states, "The Type I school bus is structurally designed to provide the greatest safety possible for its passengers."

The NSTA (National School Transportation Association) Board of Directors issued the following statement: "The Association is not so much opposed to the use of safety belts in school buses as it is supportive of the concept of compartmentalization . . . NSTA further believes that compartmentalization is preferable to any form of containment that relies upon the use of safety belts or other similar type restraining devices."[76]

On the other hand, an authority in pupil transportation from the National Highway Traffic Safety Administration claimed that "riders are better off restrained than unrestrained if the bus rolls over, crashes into another object or stops suddenly." The same authority acknowledged, however, that seat belts were not without problems, particularly in the areas of high installation costs, buses' inability to structurally accommodate such belts and difficulty ensuring proper belt adjustment for small children.[77]

In general, seat belts, are opposed by bus company operators and bus manufacturers in favor of compartmentalization. This concept of compartmentalization grew out of a 1971 UCLA study mandated by federal regulation in 1977.[78] Under compartmentalization the distance between seats, the height of seat backs (twenty-four inches) and padding to protect the child and the bus wall on one side and the aisle on the other are mandated.[79] Another argument used by seat belt opponents is that the real danger zone is outside the bus. Figures for 1979-1982 show that seventy students died on buses while 134 students were killed loading and unloading.[80] Of these, eighty-nine were killed by their own bus and forty-five were killed by other vehicles.[81] Additional arguments include: that children spend more time in the family car than in the bus; that children may not use seat belts if installed; that students should be instructed on safety measures regarding the dangers of loading and unloading and how to act in an emergency; and that children can actually be injured by the seat belts which restrain them during an accident.[82]

These claims must be weighed against the suggestions that the apparently good safety record of school buses is misleading. "According to the National Safety Council's own disclaimer in "Accident Facts," the states are inconsistent in how and what they report regarding accidents, injuries and even deaths, and that underreporting is widespread."[83]

The results of studies have been inconclusive at best. A 1967 study in which anthropomorphic dummies were used in three school buses crashed head-on, sideways and rear-end clearly established the value in passenger protection of lap belts when used with high back seats. The study noted that belts can be added to the safety seat at very little added cost and provide the continuity needed for proper training of youths concerning habitual use of restraints when riding in any vehicle.[84]

A more recent study described by Yeager conducted under a 1978 NHTSA mandate compared various manufacturer's seats under testing situations and the findings showed the differences with and without seat belts to be insignificant.

They tested at low speed and not for lateral or rear-end accidents. . . . The experiment indicated that when seat belted, the dummies had a slightly higher head force reading as they rotated over their seat belts and hit their heads on the padded seat backs and tops. Ironically, in the same tests the researchers found that the dummies of small children flew forward, hitting their foreheads on the seatbacks, flexed their heads sharply backward, arching their backs with severity. Taller dummies hit their knees and rotated forward, striking their throats on the seat tops. Since there were no measuring devices in either the backs or throats, no comparable readings were available, but the failure of the seat was evident. It has been more then seven years since the new seat has been produced. By now a significant reduction in injuries should have been noticed. The latest National Safety Council statistics show injuries down slightly, but so is the number of students being transported.[85]

Current Issues and Future Consideration

As suggested in this chapter, the three current issues regarding school transportation are: 1) potential uses of microcomputers in school transportation management, 2) possible shortage of school bus drivers and 3) whether to mandate the use of seat belts in school buses.

Administrative uses of microcomputers are being introduced across various areas and departments of school districts—and the transportation department is no exception. The three major areas for microcomputer use are: 1) routing and scheduling, 2) design of attendence areas and school district consolidation and 3) fleet maintenance. The transportation manager must determine district needs and select the program which best meets those needs. In addition to options by general and specific applications, various organizations are beginning to offer special school transportation packages developed for particular districts based on individual needs. These include programs written for efficient routing, maintenance of vehicles and persons.

Bus driver shortages are becoming a problem for many school districts. Fewer individuals are applying and when they do, it is with the intention of it being temporary. Additionally, the problem of bus drivers with criminal records suggests immediate attention be given to attracting and maintaining good bus drivers.

Safety is properly a major concern. According to estimates from the National Safety Council, 390,000 school buses transported 21.5 million students each day in 1983. Ten school bus passengers were killed and approximately 3,300 students were injured in accidents involving school buses. Many parents, school board members and law makers are convinced that seat belts would significantly reduce the number of injuries and are demanding that school buses be outfitted with safety restraints and that school systems ensure their proper use.

The increasing interest in seat belts for school bus safety has generated a new organization, the National Coalition for Seat Belts on School Buses.

School Transportation services have a complementary effect upon the school district's instructional programs and must be considered by educational administrators.

Although the social and educational issues of the past two decades—desegregation, education for handicapped children, academic excellence, program equity—have been recognized and are being dealt with by the schools, there is no sign that there will be a lessening of transportation expenditures associated with these issues.

As indicated in the opening section of this chapter, the cost of pupil transportation programs has grown dramatically in the past fifty years. Social responsibilities, as well as increased educational demands, have attributed to this escalation in costs. Busing, despite the fact that its value as a desegregation tool is being openly questioned by both parents and educators, remains the dominant force in maintaining racially mixed schools. With the continued emphasis upon deinstitutionalization, increasing numbers of severely handicapped children will remain at home and attend community schools. These students require transportation services which are specialized and expensive to provide. The push for academic excellence has had a resulting impact upon transportation costs, in the form of additional field trips, academic activities and the establishment of "magnet" schools for high-achieving students.

Program equity also has had, and will continue to have, an effect upon transportation expenditures. Several states in the past eight years have been forced to revamp their school funding methods in the wake of court decisions concerning violations of state constitutions. Pupil transportation costs will rise correspondingly with escalation of costs involved in providing additional programs and services for various groups of students, i.e., handicapped students, vocational students being transported to regional centers.

Three additional factors may contribute to an increase in pupil transportation costs: 1) parental demand for seat belts, 2) emphasis upon child safety and 3) a second "baby boom" generation. Concern for the safety of children walking to and from school has generated movements in some states to consider utilizing the busing of elementary students as a way to avert child-snatching. Although deemed as too costly a solution, mass transportation of elementary school-age children has been and continues to be viewed as one viable alternative for ensuring the safety of this age group.

Finally, a second "baby boom" is occurring as women opt to have children later in life. In many sections of the country, declining enrollments in elementary schools have been reversed and have begun to climb as children of the post-World War II baby boom generation reach school-age.

In conclusion, pupil transportation costs will not decrease in the coming years, but rather for the reasons cited, will continue to increase. To ensure equitable sharing of costs at the local district level, states must study more closely some of the factors impinging upon transportation expenses and provide funding formulas which will assist in alleviating unequitable burdens.

Notes

1. Roe L. Johns, *State and Local Administration of School Transportation* (New York: Teachers College, Columbia University, 1928).

2. E. G. Featherston, and P. Culp, *Pupil Transportation* (New York: Harper & Row, 1965).

3. Johns, *State and Local Administration.*

4. Cloyd M. Bernd, William K. Dickey & Forbis Jordan, "Revenue Requirements for School Transportation Programs and School Facilities," in *Educational Need in the Public Economy*, ed. Kern Alexander and Forbis Jordon (Gainesville, Florida: University Press of Florida, 1976).

5. Roe L. Johns, *State and Local Administration.*

6. *Acts and Resolves*, Commonwealth of Massachusetts, Chapter XCXXII, Sec. 1, (1869).

7. Dewey H. Stollar and K. Tanner, *Student Transportation Study for the State of Indiana* (Knoxville, Tennessee: University of Tennessee, 1978).

8. E. G. Featherston and P. Culp, *Pupil Transportation.*

9. Ibid., 335.

10. Ibid., 4.

11. Ibid.

12. Ibid.

13. *Swann v. Charlotte-Mecklenburg Board of Education*, 402 U.S. 1, 91 S.Ct. 1267 (1971).

14. Ibid.

15. Thomas R. Melcher, "State Pupil Transportation Programs" in *Perspective in State School Support Programs*, ed. Forbis Jordan and Nelda H. Cambron-McCabe (Cambridge, Massachusetts: Ballinger, 1981).

16. Stephen Foster and L. Fields, *A Quantitative Analysis of Florida's School Transportation Funding Formula* (Tallahassee, Florida: Executive Office of the Governor, Office of Planning and Budgeting, 1982).

17. Ibid.

18. Melcher, "State Pupil Transportation Programs."

19. Ibid.

20. Ibid.

21. Ibid.

22. Ibid.

23. Ibid.

24. Ibid.

25. Ibid.

26. S. Kern Alexander, *Equitable Financing of Public Schools: A Report to the State Superintendent of Kentucky* (Gainesville, Florida: Author, 1983).

27. Ibid.

28. Ibid.

29. Melcher, "State Pupil Transportation."

30. Ibid.

31. Frank B. Brouillet, "Report to the Legislature on Pupil Transportation," (Tumwater, Washington: Department of Education, 1981).

32. Melcher, "State Pupil Transportation Programs."

33. Patricia G. Anthony, "An Analysis of Alternative Models for Funding Handicapped Pupil Transportation," (Unpublished Dissertation, University of Florida, Gainesville, Florida, April, 1984).

34. *Fourth Annual Report to Congress on the Implementation of P.L. 94-142*, (Washington, D.C.: Office of Special Education and Rehabilitation Services, 1982).

35. J. S. Kakalik, W. S. Furry, M. A. Thomas, and M. F. Carney, *The Cost of Special Education* (Santa Monica, California: The Rand Corporation, 1981).

36. Ibid.

37. *Exceptional Child Program Transportation Data* (Raleigh, North Carolina: State Board of Education, 1982).

38. Ibid.

39. *State, Local and Federal Financing for Illinois Public Schools* (Springfield, Illinois: State Board of Education, 1983).

40. "Transportation Recapitulation—1982-83" (Baton Rouge, Louisiana: Department of Education, 1983).

41. Commonwealth of Virginia, *Report of the Joint Subcommittee Studying the Funding of the Transportation of Handicapped Children*, Senate Document No. 11, 1983.

42. "A Summary of School Finance in Arizona."

43. Anthony, "Alternative Models."

44. Ibid.

45. Ibid.

46. Kakalik, et al., *Cost of Special Education*.

47. "Quick, Tell me How to Buy Lifts and Ramps for Buses," *American School Board Journal* 169 (January, 1982), *169*, 6.

48. Dobberstein, "New Riders: Special Ed Preschoolers," *American School and University 53* (December 1980), 38+.

49. G. H. Frith, "Transportation of the Severely Handicapped: The Role of the Paraprofessional," *Journal for Special Education 19*, (1982), 49-54.

50. Nelda Cabron-McCabe, "A Model for the Cost Analysis of Alternative Delivery Systems for Exceptional Child Education Programs" (unpublished dissertation, University of Florida, Gainesville, Florida, 1982), 14.

51. Kakalik et al., *Cost of Special Education*, 131.

52. Anthony, "Alternative Models."

53. Ibid.

54. *California Education Code*, Article 8, Special Transportation, Section 56773.5(a) (1).

55. Ibid.

56. Commonwealth of Virginia. *Report of the Joint Subcommittee*.

57. "Attachment D," *Rules and Regulations for Transporting Handicapped Children* (Salt Lake City, Utah: Utah State Office of Education, 1983).

58. *Special Education Supplement to the School Bus Driver's Handbook* (Santa Fe, New Mexico: State Department of Education).

59. *New York Times*, April, 1985.

60. C.R. Ebert, "Computerized Fleet Maintenance," *School Business Affairs* (April, 1985).

61. Ibid.

62. State Dept. of Education, School District Management Assistance Team, *Computerized Pupil Transportation Systems in California* (Consultant Report prepared for the Calif. Energy Commission, June 1982), 1.

63. Ibid.

64. Ibid., 26.

65. Ibid., 27.

66. Ibid., 31.

67. Ibid., 45.

68. Ibid.

69. C. Henke, "Should Pupils be Belted?" *School Bus Fleet* (February-March, 1984), 12-15.

70. F. Rex, "Seat Belts in School Buses: A Study of Current Practice and Potential Action," *School Business Affairs* (April, 1985), 28-31.

71. A. Yeager, "The Medical Case for Seat Belts on Sch. Buses," *School Business Affairs* (April, 1985), 38-41.

72. Ibid., 38.

73. E. Farmer, "Seat Belts Usage on School Buses," *School Business Affairs* (April, 1985), 23-24.

74. Ibid.

75. Ibid.

76. Ibid.

77. Ibid.

78. Henke, "Should Pupils Be Belted?"

79. Rex, "Seat Belts in School Buses."

80. Henke, "Should Pupils Be Belted?"

81. R. Bernard, "Death Zones or Seat Belts—Which is More Important," *School Bus Fleet* (August-September, 1984), 14, 18, 30.

82. Rex, "Seat Belts in School Buses."

83. C. Fast, "A Misleading Safety Record," *School Business Affairs* (April, 1985), 32.

84. Ibid., 33.

85. Yeager, "The Medical Case for Seat Belts," 40.