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A Comparison of Public Owned and Private Owned School Transportation Systems of the Minnesota State High League, Region Number II

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A COMPARISON OF PUBLIC OWNED AND PRIVATE OWNED SCHOOL TRANSPORTATION SYSTEMS OF THE MINNESOTA STATE HIGH LEAGUE, REGION NUMBER II

BY

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Thesis Adviser

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CHAPTER I

INTRODUCTION

A Statement of the Problem

This study is concerned with the analysis of public owned and private owned school transportation conveyances. The study shall encompass the following purpose:

(1) to determine which system, district owned or contract is best recommended for southwestern Minnesota schools.

Significance of the Problem

Throughout the author's teaching experience, he has had the opportunity and challenge to defend, define, and praise various pupil transportation systems. This encouraged his curiosity, speculation, study, and finally research of the problems involved in student transportation.

It is very evident that schools must be prepared to meet the needs of pupil transportation and are doing a very commendable job. However, school transportation will continue to be a major challenge in American schools. In the last few decades there has been a population movement from rural areas to urban.[1] There has been an increase in

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[1]Douglas Chittick, Growth and Decline of South Dakota Trade Centers 1901-1951, p. 50, South Dakota State College Agricultural Experiment Station Bulletin 448, South Dakota State College: Brookings, South Dakota, May, 1955.

school population.[2] Pupil transportation expenditures have increased rapidly over the years and are related to activities in school district reorganization.[3] Franzen[4] states that schools have come to rely heavily on modern transportation facilities. All these factors have created the need, demand, and financial support of the world's largest and most unique transportation system.[5]

Various systems have evolved.[6] A comparative evaluation of these systems would furnish administrators another view of their transportation systems. This study could aid administrators in prospective areas of consolidation or reorganization.

The congested areas of today and tomorrow focus our attention on transportation with long rural hauls, urban services, cross-city routes, and physically handicapped services.[7] The present systems are mere beginnings of the future transportation systems. When the rural to

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[2]Roy C. Prentis, How Are Public Schools Financed in Minnesota?, p. 4, Minnesota Congress of Parents and Teachers, 1957.

[3]C. D. Hutchins, A. R. Munse, and E. D. Booker, Trends in Significant Facts on School Finance, p. 56, Circular No. 498, Government Printing Office: Washington, D. C., 1957.

[4]Carl B. Franzen, "Board Policies Needed for Efficient Transportation," American School Board Journal, vol. 128, 52, April, 1954.

[5]Jack H. Pollack, "School Bus," NEA Journal, vol. 47, no. 3, p. 154, March, 1958.

[6]Clayton D. Hutchins, "School Ownership of Buses," Nations Schools, vol. 36, 43-44, October, 1945.

[7]Ibid.

urban movement has considerably increased, the student transportation systems will undoubtedly include many services never thought of today.

Every administrator, teacher, parent, and student has contact with transportation problems. The transportation systems of today must be continually explored, evaluated, and revised in order to insure the vast improvements of the future student transportation systems. Increased school population, tendency towards consolidated schools, and school activity trips have mushroomed this part of the administrator's duties.[8] Research is urgent to meet the needs of this mobilization trend in the school systems. A continuous evaluation is of course necessary within the individual plant; however, a comparative evaluation among systems in a geographic area will shed additional information on the transportation setups.

This research could be utilized for future studies and as an aid to administrators consciously seeking information to improve student transportation systems. The study would also be of value in orienting new personnel with transportation aspects.

Limitations and Delimitations

This study is limited to a selected survey of transportation factors. It is evident that to compile a complete summary of all the voluminous writings pertaining to pupil transportation and include

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[8]Anonymous, "Banner Year for School Buses," Fleet Owner, vol. 52, 123-125, March, 1957.

these factors in sampling would be impractical for this study. Chapter two presents a resume of administering pupil transportation and review of literature pertaining to this study.

Minnesota State High School League, Region Number Two, was selected as the parameter because it encompasses the area concerned. Further, it limits such factors as variations in legislated regulations, climatic conditions, geographic terrain, community wealth, population density, and availability of organized private transportation companies. Such variables as road surfaces and school budget will by necessity have to be held constant.

A comparison of costs was established and evaluated. The state transportation records from the Minnesota State school transportation office at St. Paul, Minnesota, furnished data on cost, ownership, number and kind of vehicles, and number and classification of students transported for the districts involved. A comparison of the above data was computed by use of the arithmetic means.

It is evident that the evaluation should be based on the amount and quality of services rendered per cost element. Therefore, a questionnaire was prepared and sent to the sixty schools represented in this parameter. This questionnaire was designed to evaluate the efficiency and satisfaction aspects of the transportation systems. The chi square was employed to determine comparative ratings of the responses

among the transportation systems.[9] The chi square is a method of comparing experimentally obtained results with those to be expected theoretically on a hypothesis. The selected hypothesis was the null hypothesis of equal probability.[10] It is expected that the answers are a matter of chance; therefore, 50% will respond favorably to a proposition and 50% will not respond favorably.

Definitions

In this study, "Other Systems" will refer to school transportation systems where:

(1) districts own the bus bodies and contract for the chasis.

(2) districts own the buses and contract smaller vehicles.

(3) districts own part of fleet and contract other needed buses.

(4) or any combination of the above provisions.

The Design of This Study

In as far as possible, all literature pertaining to pupil transportation was sought, read, and critically analyzed. Information pertinent to the topic of the research was carefully recorded and filed in preparation for writing the manuscript. Chapter two encompasses an orientation of the administration of pupil transportation and a selected

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[9] H. E. Garrett and R. S. Woodworth, Statistics in Psychology and Education, p. 283, Longmans, Green, and Company: New York, 1958.

[10] Ibid., p. 256.

review of literature on the topic in question.

A personal visitation to the Minnesota State School Transportation Office at St. Paul, Minnesota, resulted in acquiring and collecting cost, ownership, number and types of vehicles, and number of students transported from the state transportation records. The above data will be individually tabled and evaluated. From the state records the type of ownership was recorded as contracted, public owned, and "other school transportation systems." Each table will be listed under these headings. Chapter three details data from the state transportation records and responses from the questionnaire. The chi square technique with the null hypothesis of equal probability was employed to evaluate the questionnaire responses (see page five). Garrett and Woodworth[11] state that it is often satisfactory to accept the .05 significance level. A table was prepared to accommodate the questionnaire computations. Table evaluation will be narrated in the text of chapter three.

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[11] Ibid., p. 223.

CHAPTER II

RESUME OF ADMINISTERING PUPIL TRANSPORTATION AND SELECTED REVIEW OF LITERATURE

The Planning of Routes

The local administration should establish state and local standards as regards walking distances, shelter arrangements, time pupils may be required to spend between home and school, school bus standards and qualifications for drivers and the like.[11] When standards have been established, or preferably prior to that, a transportation map may be made for the local district. Minnesota statutes require a displayed transportation map with specific information.[12] On the basis of the local standards and the information given on the transportation map, the local routes can be planned.

Reeder[13] states that the distances which elementary school pupils are to be transported is two miles or more and in some states it is beyond one mile. Where possible, the time children are on the road should be much less than one hour.[14]

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[11] Ward G. Reeder, The Fundamentals of Public School Administration, pp. 399-401, The Macmillan Company: New York, 1951.

[12] Manual of Standards for the Transportation of Public School Pupils, pp. 13-14, Mutual Service Insurance Companies: Saint Paul.

[13] Reeder, op. cit., p. 402.

[14] Ibid, p. 404.

Minnesota statutes state that elementary pupils should not be on the buses for more than one hour for each trip, and the high school pupils not more than one and one-half hours for each trip.[15] It is evident in determining the time-schedule, such factors as the speed at which the bus travels, the type and condition of roads, the number of stops, the distance and other factors must be considered. The administrator may find it beneficial to drive a trial route in a car, checking stops and mileage as a basis for planning the time schedule. By driving at a rate of speed at which the buses are expected to travel the schedule thus derived for the final routes will need little adjustment. The buses may make a trial run prior to the opening of school, at which time a further check upon the prepared time schedule can be made.

If it is found that the buses can not stop at every home, the children should gather at some specified point to be picked up by the school bus.[16] It is the responsibility of the school authorities to designate the place, preferably a home.[17] If this is not possible, other means of shelter must be constructed, heated in winter, and supervised by an adult. Sometimes a crossroads store or a rural school can serve as a waiting station. A temporary box-like structure enclosed on three

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[15]Manual of Standards for the Transportation of Public School Pupils, op. cit., p. 13.

[16]Reeder, op. cit., p. 405.

[17]Ibid.

[18]School Buses: Their Safe Design and Operation, p. 14, The National Safety Council, Inc.: Chicago, 1938.

sides might be used as a last resort.[19]

The development of a transportation map will show all roads with the type of surface and safety hazards such as hills, dangerous curves, intersections, railroad crossings, and the like.[20] With this information graphically portrayed, the planning of routes is considerably simplified. Trial routes may be sketched lightly and after they have been proven to be satisfactory, they may be indicated by various colored lines plus a route number. A criterion for proposed routes has been prepared by Butterworth and Ruegsegger:[21]

1. No child is required to spend time on the road in excess of the local standards.
2. The largest possible proportion of children are picked up at home.
3. No child is required to walk a distance to the bus in excess of local standard.
4. The bus to be placed on the route will not need to be overloaded, yet will be loaded nearly to its rated, seating capacity.
5. The route as planned requires no more bus-miles than are absolutely necessary in order to afford the desired convenience for pupils.
6. Necessary shelter can be provided at waiting points.
7. No safety hazards which can be avoided are on the route.

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[19]Julian E. Butterworth and Virgil Ruegsegger, Administering Pupil Transportation, p. 10, Guide to Section Series, Educational Publishers Inc.: Minneapolis, 1941.

[20]Manual of Standards for the Transportation of Public School Pupils, op. cit., p. 14.

[21]Ibid., p. 13.

The School Bus

After the local routes are planned, the conveyances to fit the routes can be purchased, if the transportation is to be by means of district ownership. If transportation is to be by private contract, contracts may now be let. Whether the bus is owned by the school or whether it is contracted for by the Board of Education, it should meet state and local requirements. When the bus is contracted, these requirements should be specified in the contract which should also provide for the proper upkeep of the vehicle (see pages 59 and 60 for a representative contract). Minnesota statutes, section 125.181, provides that all transportation contracts be submitted to the Commissioner of Education for approval and must meet provisions set forth in said section.[22]

The size of the school bus will be determined by the number of children it will carry and by state requirements.[23] The chassis should be a motor coach chassis because it will then have a lower center of gravity and will be less likely to tip than a truck.[24] Provisions for the school bus chassis and body for Minnesota are set up in detail in

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[22]Manual of Standards for the Transportation of Public School Pupils, op. cit., pp. 6-7.

[23]Manual of Standards for the Transportation of Public School Pupils, op. cit., p. 24.

[24]School Buses: Their Safe Design and Operation, op. cit., p. 4.

Minnesota statutes, section 125.065 and 169.67 through 169.73.[25] The inside height of the bus body should be sixty inches.[26] The buses should have approved roof ventilators and also the windows should be so designed that they can be opened.[27] It is obvious that every school bus should be adequately heated when necessary. The service door should be constructed so it won't open until the operator desires it.[28] The door should have a minimum clearing of 24 inches and should be located opposite the driver on the right side of the bus.[29] There should be suitable non-slip steps, the first one not over 10 inches from the ground.[30] The lower panel should be of glass and door jambs should be equipped with rubber to protect fingers.[31] An emergency door located in the rear end of the bus or near the rear on the right side must be included in the standards.[32] The following specifications as quoted

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[25]Manual of Standards for the Transportation of Public School Pupils, op. cit., pp. 15-26.

[26]School Buses: Their Safe Design and Operation, loc. cit.

[27]Loc. cit.

[28]H. H. Punke, "Care, Injury and Tort Liability in Pupil Transportation," American School Board Journal, vol. 131, 33-35, October, 1955.

[29]Manual of Standards for the Transportation of Public School Pupils, op. cit., p. 28.

[30]School Buses: Their Safe Design and Operation, loc. cit.

[31]Ibid., p. 5.

[32]Manual of Standards for the Transportation of Public School Pupils, loc. cit.

should be observed:[33]

1. It must give a minimum horizontal clearance of 18 inches.

2. It must give a minimum vertical clearance of 48 inches.

3. It must be conspicuously marked on the inside "Emergency Door."

4. It must be provided with a fastening device which can be protected against accidental release. This release should not be under the control of the operator. Such control would involve a complicated linkage between the fastener and the driver's seat which might easily become jammed if the bus were involved in an accident, thus making the door inoperative at a time when it was needed most. This device should be tested regularly.

5. There should be no steps to the emergency door.

6. Buses must be so constructed that no obstruction will prevent the passage of passengers to and through the emergency door. An unobstructed aisle at least 12 inches wide should lead to this door.

The lineal allotment is 13 inches for grade school pupils and 15 inches for high school pupils.[34] To provide for an increase in enrollment, the purchase of a bus may be one with a greater capacity than is needed at the time. All windows and glass panels should be of safety glass.[35] The construction of the bus should be so designed as to eliminate "blind spots."[36] The interior and the steps should be

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[33]School Buses: Their Safe Design and Operation, loc. cit.

[34]Ibid.

[35]Manual of Standards for the Transportation of Public School Pupils, op. cit., pp. 31-32.

[36]Ibid., p. 27.

provided with lights.[37] A red button type reflector should be placed on the left rear corner and also the right rear corner.[38] The gasoline tank should be separate from the body.[39] Of course, there should be bumpers on the bus. It is evident that the bus have guard rails at seat level, windshield wiper, sunvisor, and rear vision mirrors. On the rear of the bus should be placed a light signal flashing "stop" and the bus should have "School Bus" signs on all sides painted in 6 inch letters.[40] The buses should be painted golden-orange with black fenders.[41] The vehicle should also be equipped with a fire extinguisher, skid chains, first aid kit, warning flags, and flares.[42]

According to Reeder[43] there are three types of bus ownership. Under the contract plan, the district hires independently owned vehicles and does not have the responsibility of maintenance. The school-ownership plan necessitates purchases of buses, employment of drivers, and maintenance. Under the joint-ownership plan (called "Other Systems" in this study), the district provides part of the bus or buses and is responsible for the operation and upkeep of that part of the equipment.

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[37] Ibid., p. 36.

[38] Ibid., pp. 36-37.

[39] Ibid., p. 20.

[40] Ibid., p. 35.

[41] Ibid., p. 27.

[42] School Buses: Their Safe Design and Operation, op. cit., pp. 3-7.

[43] Reeder, op. cit., pp. 415-416.

An administrator should not purchase a fleet of buses without first making a study of practices in his part of the state.[44] In determining the purchase of a fleet of buses, the following criteria will be helpful:[45]

1. Demand of the salesman evidence as to the performance of his vehicle.

2. Study local conditions and select buses which under these conditions give evidence of being able to insure regularity of service with safety and comfort to passengers.

3. Check prospective purchases against high standards.

4. Seek information on the experience of others as to the most satisfactory buses in terms of performances and economy.

5. Get the bus which represents the most value per dollar.

6. If the amount that can be spent for buses is definitely limited, get the best bus that can be bought for the money available.

To the above list may be added--check state requirements, especially where conditions are such that purchases are advocated through certain school board members.

Indoor storage should be provided for the buses.[46] A school owned garage at the school site is desirable. If the school provides

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[44]Butterworth and Ruegsegger, op. cit., p. 25.

[45]Ibid.

[46]G. E. Featherston, "School Bus Garages," The American School and University, pp. 146-149, American School Publishing Corporation: New York, 1947.

its own storage and repairing facilities, it is especially easy to purchase its gas and oil in wholesale quantities. Part of the provisions of the contract as set up by Minnesota Statutes, Section 12[illegible].181, states that conveyances are to be sheltered at all times when not in actual use.[47]

Buses are sometimes used to transport pupils to and from school events and even to distant places. A school authority should accompany the bus on trips of this nature and the driver should be the regular driver.[48]

The School Bus Driver

Under district ownership, the drivers may be employed after the routes have been planned and the vehicles selected. They should be qualified to meet the state and local standards.[49] Plans should be made to provide a program of local training prior to the opening of the transportation system.[50]

The driver should be selected for dependability, good habits, unquestionable character, and his complete willingness to follow, unfailingly, the instructions and requirements of the superintendent

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[47] Manual of Standards for the Transportation of Public School Pupils, op. cit., p. 6.

[48] School Buses: Their Safe Design and Operation, op. cit., p. 14.

[49] Manual of Standards for the Transportation of Public School Pupils, op. cit., pp. 4-6.

[50] Reeder, op. cit., p. 411.

or school board.[51] Normally the prospective school bus driver should apply to the principal or superintendent; however the superintendent should recommend the best applications to the board of education.[52] The outstanding duties of school bus drivers are safe pupil transportation, proper regard for health and comfort, exercise a desirable influence over the students, and maintain custody over his bus.[53]

The certification standards of the school bus driver should be:[54]

1. A minimum age of 21.
2. Physical fitness, this to be determined by an examination.
3. Knowledge of transportation laws and practices, this to be determined by an examination.
4. Good character and good habits.

Minnesota Statutes 1953, Section 168.40, Subdivision 2 and Section 168.43, set up requirements for physical and written examinations for bus drivers.[55] The provisions include a minimum age of 18, passage of a school bus driver's license examination, and physical examination. Experience and character ratings, though required by State legislation, are at the discretion and convenience of the local district.

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[51] Ibid., p. 408.

[52] Ward G. Reeder, A Manual for the School Bus Driver, p. 11, The Educators' Press: Ohio, 1939.

[53] Ibid., pp. 5-7.

[54] Ibid., p. 10.

[55] Manual of Standards for the Transportation of Public School Pupils, op. cit., pp. 4-6.

If operating rules for the drivers are not found adequate in the transportation regulations of the State Department of Education, they may be supplemented to supply the needs of the individual system. Reeder groups the rules under the following headings:[56]

1. Rules governing driver's personal habits.
2. Rules for the supervision of pupils.
3. Rules governing safe driving.
4. Rules governing care of bus.
5. Rules for handling accidents
6. Miscellaneous

The rules governing the driver's personal habits should include personal cleanliness, proper physical and mental condition, and avoid using vulgar language, tobacco, and alcoholic beverages.[57] The driver should post a set of pupil's rules in the bus and carry out the enforcement of these rules.[58] It is evident he must obey all traffic rules and regulations of the state and local divisions of government. The responsibilities the drivers have to their districts can be summarized as punctuality, regularity, behavior reflecting credit to the system, loyalty, alertness to improvement in service, constant concern for the safety of the children, knowledge of laws and traffic regulations, and

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[56]Ward G. Reeder, The Fundamentals of Public School Administration, p. 412, The Macmillan Company: New York, 1951.

[57]Manual of Standards for the Transportation of Public School Pupils, op. cit., pp. 6-7.

[58]Reeder, op. cit., p. 412.

practice thoroughly in accordance with them.[59]

It must further be stated that the school district has responsibilities to the drivers.[60] The compensation should be consistent with the cost of living in the community.[61] Other responsibilities would include security in position, liability insurance if legal, definition of driver's responsibilities, well maintained vehicles, and provision of knowledge of school policies.[62]

Transportation Insurance

Insurance should protect the school district, the pupils, and the public.[63] The policies for them may be filed with the board of education. If the board of education contracts its buses the following types of insurance should be required of the contractor:[64] (1) bodily injury liability; (2) pupil accident; and (3) property damage. The cost of this insurance would of course be met by the board and not be the contractor.

The expenditure of public funds for certain types of insurance has been declared illegal by the courts in some of the states; therefore

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[59]Butterworth and Ruegsegger, op. cit., p. 34.

[60]Reeder, op. cit., pp. 410-411.

[61]Ibid.

[62]Butterworth and Ruegsegger, loc. cit.

[63]Reeder, op. cit., p. 38.

[64]Ward G. Reeder, A Manual for the School Bus Driver, p. 39, The Educators' Press: Ohio, 1939.

an administrator must check to see if the statutes and court decisions permit the types of insurance the system desires.[65] Minnesota statutes have a permissive clause in that insurance may be obtained if a clause is inserted in the policy waivering public service immunity.[66] It is apparent the amount of insurance to be carried will be determined by the condition of the school budget. When the finances of the school district will permit the carrying of only one type of insurance, that type should probably be bodily injury liability.[67]

Even though precautions are taken, accidents do happen. Insurance should be carried and it should protect:[68] (1) the pupils transported; (2) the school district; (3) the bus driver or contractors; and (4) the general public. Under public ownership of the transportation equipment, the following types of insurance are recommended by Reeder:[69] (1) bodily injury liability; (2) pupil accident; (3) property damage; (4) fire; (5) theft; (6) tornado; and (7) either full or deductible collision.

Frequent misunderstanding of the types of insurance is prevalent.

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[65]Reeder, op. cit., pp. 428-429.

[66]Laws Relating to the Minnesota Public School System, p. 96, State of Minnesota, Department of Education: St. Paul 1, Minnesota, 1957.

[67]Reeder, loc. cit.

[68]Ward G. Reeder, The Fundamentals of Public School Administration, p. 421, The Macmillan Company: New York, 1951.

[69]Ibid.

Reeder[70] has condensed a brief description of the more common types of transportation insurance and are as follows:

1. Bodily Injury Liability. Pay on behalf of the insured all sums which the insured shall become obligated to pay by reason of the liability imposed upon him by law because of bodily injury resulting from accident and arising out of the ownership, maintenance or use of the transportation vehicle insured. Most policies set a limit of $5,000 for each person and of $50,000 to $100,000 for each accident.

2. Pupil Accident. Pays the amounts stated in the policy for certain types of injury and for death. These amounts are paid whether the bus driver was responsible for the accident or not. In bodily injury liability insurance, mentioned above, if the driver was not legally liable for the accident, there would be no protection to pay the bills and to compensate the child or his parents.

3. Property Damage Liability. Pays on behalf of the insured all sums which the insured shall become obligated to pay by reason of the liability imposed upon him by law for damages because of injury to or destruction of property. This type of insurance pays for damages to the other person's property, not for damages to the property of the person insured.

4. Fire and Lightning. Pays for loss consisting of injury to or destruction of the transportation vehicle and its equipment caused by fire or lightning.

5. Theft, Robbery, or Pilferage. Pays for loss consisting of the theft, robbery, or pilferage of the transportation vehicle and its equipment.

6. Tornado, Cyclone, Windstorm, Hail, Earthquake, Explosion, and Water Damage. Pays for loss consisting of injury to or destruction of the transportation vehicle and its equipment caused by any of the factors just named.

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[70] Ward G. Reeder, A Manual for the School Bus Driver, pp. 37-38, The Educators' Press: Ohio, 1939.

7. Full Collision. Pays for loss consisting of damage to or destruction of the transportation vehicle and its equipment, caused by accidental collision with another object, either moving or stationary, or by upset, or while the vehicle is parked or unattended.

8. Deductible Collision. Pays for loss consisting of damage to or destruction of the transportation vehicle and its equipment, caused by accidental collision with another object . . ., but only for the amount of each separate loss, when determined, in excess of the deductible sum stated in the policy. The deductible sum may be set at any amount, but the usual amount ranges from $25.00 to $50.00.

Transportation Accounting and Costs

The local administrator naturally wishes to secure a desired quality of transportation service at the least possible cost. As a means of securing comparable data, Tisinger and Wintz[71] have developed a uniform cost accounting plan. This plan includes five accounts: (1) A uniform classification of all items. They recognize ten major classes of items, with thirty-three subdivisions. Even though the number of subdivisions may be reduced or increased as the needs of the community demand, costs may be compared as regards the major classes. (2) A general journal for the recording, through a double entry system, of all cost items for transportation. (3) An analysis ledger, whereby a record may be kept of the various costs of operating each vehicle. (4) An analysis of cumulative transportation costs, permitting

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[71] Butterworth and Ruegsegger, op. cit., pp. 159-197.

comparison at the end of each month or quarter with the costs of the same vehicle for other years. (5) A property ledger, giving the life history of each vehicle. These forms may be simplified in various ways to conform to the available facilities in, or the requirements of, the particular transportation system.

After the costs are computed, the administrator may then determine whether the costs are reasonable. There are many studies of the cost of pupil transportation. However, the information is not accurate or inclusive enough to judge management efficiency.[72]

It is evident the local administrator in charge of pupil transportation will improve the efficiency and safety of the service provided by subjecting current practices to continuing, critical appraisal. Involved is the understanding that costs are significant only in light of the quality of service rendered.

Obviously, the standards dealing with "quality of service" require careful formulation. Progress will result from careful advance planning of all transportation enterprises, careful evaluation of the quality of service rendered by existing programs, accurate cost accounting, and the energy and determination to modify practice once the need is clear.

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[72] Ward G. Reeder, The Fundamentals of Public School Administration, p. 421, The Macmillan Company: New York, 1951.

Selected Review of Literature on Transportation

Research studies made by Reeder,[73] Meadows,[74] Lambert,[75] Butterworth, and Ruegsegger[76] conclude that the cost of pupil transportation service with school-owned equipment is about 40% lower than with contracted buses. Hutchins[77] maintains that school-owned buses are usually in safer operating condition because more regular maintenance work is provided. Another point Hutchins wrote was that school executives have greater control over the transportation system if the vehicles are owned by the boards of education. Dawson and Hutchins[78] support the above views and advantages of board ownership as lower costs, better control, greater flexibility, safer transportation, better drivers, improved maintenance, and more adequate service.

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[73] Ward G. Reeder, The Administration of Pupil Transportation, p. 416, The Educators' Press: Columbus, Ohio, 1939.

[74] A. R. Meadows, "Administration of School Transportation," Review Educational Research, vol. 11, 203-211, 1941.

[75] A. D. Lambert, School Transportation, p. 124, Stanford University Press, 1938.

[76] J. E. Butterworth and Virgil Ruegsegger, Administering Pupil Transportation, p. 197, Educational Publishers, Inc.: Philadelphia, 1941.

[77] C. D. Hutchins, "School Ownership of Buses," Nation's Schools, vol. 36, 43-44, October, 1945.

[78] Howard A. Dawson and Clayton D. Hutchins, "School-Bus Ownership," as written for Walter S. Monroe (editor), revised edition, Encyclopedia of Educational Research, pp. 1490-1491, The Macmillan Company: New York, 1950.

However, Farnham G. Pope[79] in an article summarizing his doctural thesis, stated his comparison revealed no significant difference between the two systems in New York State. He did point out that some schools were favored with the presence of established transportation concerns willing and able to handle school transportation service at a cost figure substantially below expected costs under district ownership. Reeder[80] assures that most studies of the cost of pupil transportation present evidence that favors school-owned conveyances. He lists two of the many factors that help cause the economy of school-owned conveyances: (1) school-owned buses are not run for profit, whereas contracted ones necessarily have that motive, and (2) school-owned buses are usually exempt from all forms of taxation whereas contracted ones usually must pay all types of taxes.

According to Hutchins[81] and Reeder,[82] school boards originally contracted teams and either purchased or contracted wagons with hand-built bodies. Reeder[83] wrote, "That with the advent of the automobile

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[79]Farnham G. Pope, "Which System of Transportation, District-Owned or Contract, Is More Economical?", American School Board Journal, vol. 121, 25-27, August, 1950.

[80]Ward G. Reeder, The Fundamentals of Public School Administration, p. 416, The Macmillan Company: New York, 1951.

[81]C. D. Hutchins, "School Ownership of Buses," Nation's Schools, vol. 36, 43-44, October, 1945.

[82]Ward G. Reeder, The Fundamentals of Public School Administration, p. 413, The Macmillan Company: New York, 1951.

[83]Ibid.

improved roads, and school consolidation there has been a tendency toward state regulation of student transportation."

It is evident and should not be overlooked that a good preventive maintenance program will increase the efficiency and safety of transportation service and that these are results which cannot be translated into dollars-and-cents value. Featherston[84] writes, "That school bus garages are rapidly becoming not only an accepted but an expected part of the school plant of administrative units which serve fairly large rural areas."

According to Richard Ferrand,[85] Director of Transportation for the Lancaster Central School District, New York State, two-way radios have increased operation efficiency and scheduling of the eighteen buses owned by the school district. Dyment, as quoted by Ferrand,[86] "maintains that bus radios, connected with a central receiver station, have increased the over-all flow of moving students to the various schools served by the centralized district." Should a bus become disabled in snow or have a breakdown, the driver only has to call to the central station and a spare bus will pick up his passengers and take over the route, while the vehicle is being repaired.

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[84]G. E. Featherston, "School Bus Garages," The American School and University, 1947-1948, pp. 146-149, American School Publishing Corporation: New York, 1947.

[85]Robert Dyment, "Two-Way Radio System for School Buses," American School Board Journal, vol. 135, 44, August, 1957.

[86]Ibid.

CHAPTER III

THE FINDINGS AND INTERPRETATION OF DATA

Data for this chapter were derived from two main sources. The first source was the Minnesota State transportation records. Mr. Haggerty, head of the School Transportation Division of the Minnesota State Department of Education, granted permission and aid in collecting information pertinent to the study. The state records furnished data on ownership, type, and number of vehicles; number of routes and pupils transported; and district expenditures for school transportation.

The second source for procuring data was the questionnaire. "The Pupil Transportation Score Card" prepared by Virgil Ruegsegger[87] was used in a greatly modified form to measure the quality of transportation service rendered by the 22 contracted, 24 district owned, and 14 "other systems" of transportation included in the study. According to Pope[88] the Ruegsegger Score Card is at the present time the best device known for measuring the quality of service rendered by a transportation system. Pope[89] admits the score card has limitations but it provides a uniform, objective basis for quality comparison. Ruegsegger proclaims "The Pupil Transportation Score Card" provides an orderly objective basis for quality, regularity of service, convenience,

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[87] Butterworth and Ruegsegger, op. cit., pp. 51-86.

[88] Pope, loc. cit.

[89] Ibid.

and personal characteristics of bus operators as major considerations in defining quality of service.[90]

Data for Tables I, II, and III were obtained from the Minnesota State transportation records. The information was compiled from the 1957-1958 school district reports. It will be noted that each type of transportation has its represented districts arranged alphabetically in the first column. The districts reported expenditures are recorded in column three. The per pupil cost in column four was derived by dividing total expenditures by total number of students transported. The average cost per pupil for each type of transportation system was obtained by adding column four and dividing by the number of systems tabulated in each table. Table II shows public owned transportation systems average per pupil cost was $46.69. Contracted systems average per pupil cost was $67.31 and "other systems" average per pupil cost was $56.51 (see Tables I and III). It is evident that public owned systems have been the least costly.

From the state transportation records it was found that a variety of vehicles were used in transporting students (see pages 32-34). Bus sizes ranged from 16 passengers to 72 passengers. Other vehicles used were automobiles, station wagons, and panel trucks. Tables IV, V, and VI (pages 32-34) have the vehicles reported by school districts aligned in columns. The most popular bus size for contracted systems was the 48 passenger; however, the most popular

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[90]Butterworth and Ruegsegger, loc. cit.

TABLE I. COST PER PUPIL PER YEAR FOR CONTRACTED TRANSPORTATION SYSTEMS IN PARAMETER*

Name of School	Expenditures	Number of Students	Cost/Pupil/Year**
Amboy	$13705.53	190	$72.13
Beaver Creek	13160.00	183	71.91
Edgerton	19613.15	252	77.83
Fairmont	18900.00	373	51.68
Fulda	37500.75	690	54.35
Good Thunder***	1287.00	---	-----
Hanska	14154.50	152	93.12
Heron Lake	15912.50	258	61.68
Lake Crystal	28120.50	386	72.85
Madelia	31680.02	453	69.93
Nicollet	22531.05	300	75.10
Pemberton	10388.00	143	71.94
Pipestone	69637.00	867	80.32
Round Lake	11209.40	191	58.69
St. James	10440.00	477	21.89
Slayton	44220.00	539	82.04
Storden	17100.00	204	83.82
Trimont	19408.21	296	65.57
Truman	23781.00	413	57.58
Wells	28784.20	423	68.24
Westbrook	27081.00	362	74.81
Windom	24840.50	518	47.95

Total mean cost/pupil/year $M = \frac{\Sigma X}{N} = \frac{\$1413.43}{21} = \$67.31$

*Data taken from Minnesota State transportation records.

**Cost/pupil/year derived at by dividing total contract expenditures by total number of students transported.

***Good Thunder's state school transportation record was incomplete.

TABLE II. COST PER PUPIL PER YEAR FOR PUBLIC OWNED TRANSPORTATION SYSTEMS IN PARAMETER*

Name of School	Expenditures	Number of Students	Cost/Pupil/Year**
Adrian	$13602.12	247	$54.66
Brewster	11398.33	272	41.91
Bricelyn	8261.52	220	37.57
Butterfield	14888.10	290	51.34
Ceylon	10935.93	250	43.74
Chandler	9595.85	217	44.22
Delavan	16210.93	293	55.33
East Chain	12216.80	304	40.19
Ellsworth	8170.48	138	59.21
Elmore	11457.09	225	50.92
Frost	9954.78	220	45.25
Garden City	7680.27	155	49.55
Granada	9403.33	286	32.88
Huntley	11382.57	216	52.69
Jasper	13502.09	338	39.95
Jeffers	11056.92	281	39.35
Magnolia	10116.75	190	53.25
Mapleton	21728.66	466	46.63
Minnesota Lake	10996.18	268	41.03
Okabena	6561.46	181	36.25
Rapidan	7170.53	156	45.97
Sherburn	13302.88	283	47.01
Welcome	12600.64	276	45.65
Winnebago	18084.88	274	66.00

Total mean cost/pupil/year $M = \frac{\Sigma X}{N} = \frac{\$1120.55}{24} = \$46.69$

*Data taken from Minnesota State transportation records.

**Cost/pupil/year derived by dividing total expense by total number of students transported.

TABLE III. COST PER PUPIL PER YEAR FOR OTHER TRANSPORTATION SYSTEMS IN PARAMETER*

Name of School	Expenditures	Number of Students	Cost/Pupil/Year**
Blue Earth	$26557.10	445	$59.68
Comfrey	15477.29	274	56.48
Hills	9905.10	171	57.92
Jackson	22472.50	402	55.90
Kiester	26049.41	416	62.62
Lakefield	13351.48	292	46.88
Lake Wilson	8931.74	226	39.52
Luverne	25770.97	467	55.18
Mankato	74370.75	1057	70.36
Mountain Lake	24351.07	516	47.19
St. Clair	9252.80	270	46.72
Sioux Valley	12819.10	226	56.72
Waldorf	17362.29	274	63.36
Worthington	42264.00	582	72.61

Total mean cost/pupil/year $M = \frac{\Sigma X}{N} = \frac{\$791.14}{14} = \$56.51$

*Data taken from Minnesota State transportation records.

**Cost/pupil/year derived by dividing total expenses by total number of students transported.

size for public owned and "other systems" was the 42 passenger size bus. It is noted that 33 automobiles, station wagons, and panel trucks were used in the contracted transportation systems. Forty-seven automobiles, station wagons, and panel trucks were used by the "other systems" and only four automobiles and station wagons were operated by the public owned transportation systems. Reeder[91] states that school buses of large capacity have been found to be cheaper to operate on a per pupil basis than those of small capacity. It is apparent that cost per pupil may have been reduced if contracted and "other systems" had more efficient vehicles.

With knowledge of the per pupil cost and types of vehicles used in the various transportation systems, we now compare the number of routes and pupils per route. The necessary data for Tables VII through IX (see pages 35-37) was obtained from the Minnesota State transportation records for the school year 1957-1958. The types of transportation systems are arranged alphabetically followed by a column recording the number of routes. The mean number of routes was derived by dividing the sum of the number of routes by systems tabulated. The total number of students (see Tables I-III, pages 28-30) was divided by the systems represented on the respective tables to obtain the mean number of pupils per type of transportation system. The average number of pupils per route could now be computed by dividing the average number of students transported by the average number of routes per type of

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[91] Reeder, op. cit., p. 415.

TABLE IV. NUMBER AND TYPES OF VEHICLES USED FOR CONTRACTED TRANSPORTATION SYSTEMS

Name of School	Recommended Passenger Capacity for Buses									Cars	Station Wagon	Panel Truck
	16	20	24	36	42	48	54	66	72			
Amboy					3	2						
Beaver Creek				5								
Edgerton					6							
Fairmont					1	4	2					
Fulda						13						
Good Thunder						2						
Hanska					1		2					
Heron Lake				1	3	2						1
Lake Crystal					2	5			1			
Madelia*												
Nicollet				1	2	2	2					
Pemberton					4							
Pipestone						14					1	1
Round Lake					3	21						
St. James						11					1	
Slayton					7	4					2	1
Storden					5							
Trimont				2	4					24	1	
Truman					2	5						
Wells					3	6						
Westbrook					2	6						
Windom					9	2						

*Madelia's transportation report to the state department was incomplete.

TABLE V. NUMBER AND TYPES OF VEHICLES USED FOR PUBLIC OWNED TRANSPORTATION SYSTEMS

Name of School	Recommended Passenger Capacity for Buses								Cars	Station Wagon	Panel Truck
	16	20	24	36	42	48	54	72			
Adrian					6						
Brewster					6						
Bricelyn				3	3						
Butterfield				2	5						
Ceylon					6						
Chandler					5						
Delavan					8						
East Chain					7						
Ellsworth					4						
Elmore					5					1	
Frost				3	4				1		
Garden City				1	3	1					
Granada				2		5					
Huntley					6				1		
Jasper					7	1					
Jeffers				2	6						
Magnolia					5						
Mapleton				2	8						
Minnesota Lake				1	5	1					
Okabena					4						
Rapidan						4					
Sherburn					7						
Welcome					6	1					
Winnebago					10					1	

TABLE VI. NUMBER AND TYPES OF VEHICLES USED FOR OTHER TRANSPORTATION SYSTEMS

Name of School	Recommended Passenger Capacity for Buses								Cars	Station Wagon	Panel Truck
	16	20	24	36	42	48	54	72			
Blue Earth				7	3	2				3	
Comfrey				1	7	2					
Hills				1	4						
Jackson					5	6			1		
Kiester					6	2					
Lakefield				1	6						
Lake Wilson					4				35		
Luverne					12	1					1
Mankato					6	16	6		2	3	
Mountain Lake	1	1	1	1	10						
St. Clair					4	2					
Sioux Valley				3	3						
Waldorf					6					1	
Worthington					3	15				1	

TABLE VII. NUMBER OF ROUTES FOR CONTRACTED TRANSPORTATION SYSTEMS IN PARAMETER

Name of School	Number of Routes	Name of School	Number of Routes
Amboy	5	Pemberton	4
Beaver Creek	5	Pipestone	20
Edgerton	6	Round Lake	4
Fairmont	8	St. James	12
Fulda	13	Slayton	17
Good Thunder*	--	Storden	5
Hanska	3	Trimont	33
Heron Lake	8	Truman	7
Lake Crystal	8	Wells	9
Madelia	10	Westbrook	8
Nicollet	7	Windom	11

Mean number of routes:

$$M = \frac{\Sigma X}{N} = \frac{208}{21} = 9.90$$

Mean number of pupils (see Table I):

$$M = \frac{\Sigma X}{N} = \frac{7670}{21} = 365.24$$

Mean number of pupils/route:

$$M = \frac{\Sigma X}{N} = \frac{365.24}{9.9} = 36.89$$

*Good Thunder's transportation record to the state department was incomplete.

TABLE VIII. NUMBER OF ROUTES FOR PUBLIC OWNED TRANSPORTATION SYSTEMS IN PARAMETER

Name of School	Number of Routes	Name of School	Number of Routes
Adrian	6	Grenada	7
Brewster	6	Huntley	6
Bricelyn	5	Jasper	8
Butterfield	7	Jeffers	7
Ceylon	7	Magnolia	5
Chandler	5	Mapleton	14
Delavan	7	Minnesota Lake	6
East Chain	7	Okabena	4
Ellsworth	4	Rapidan	4
Elmore	6	Sherburn	7
Frost	8	Welcome	7
Garden City	5	Winnebago	11

Mean number of routes:

$$M = \frac{\Sigma X}{N} = \frac{159}{24} = 6.63$$

Mean number of pupils (see Table II):

$$M = \frac{\Sigma X}{N} = \frac{6086}{24} = 253.58$$

Mean number of pupils/route:

$$M = \frac{\Sigma X}{N} = \frac{253.58}{6.63} = 38.25$$

TABLE IX. NUMBER OF ROUTES FOR OTHER TRANSPORTATION SYSTEMS IN PARAMETER

Name of School	Number of Routes	Name of School	Number of Routes
Blue Earth	11	Luverne	16
Comfrey	10	Mankato	45
Hills	5	Mountain Lake	13
Jackson	11	St. Clair	6
Kiester	8	Sioux Valley	6
Lakefield	7	Waldorf	6
Lake Wilson	35	Worthington	17

Mean number of routes:

$$M = \frac{\Sigma X}{N} = \frac{198}{14} = 14.14$$

Mean number of pupils (see Table III):

$$M = \frac{\Sigma X}{N} = \frac{5618}{14} = 401$$

Mean number of pupils/route:

$$M = \frac{\Sigma X}{N} = \frac{401}{14} = 29$$

transportation. It is noted that contracted and "other systems" calculate the most numerous routes and the least students per route. Public owned transportation systems rank highest in efficiency as far as number of students per route and number of routes.

As was previously stated in this chapter, the study's questionnaire was designed to test transportation system's efficiency and satisfaction (see page 26). The question responses have been individually compiled and segregated by dividing the transportation systems into three categories--contracted, public owned, and "other systems." Question number one (see page 63) pertains to public relations. The Department of Education School Bus Regulations and the Minnesota Motor Vehicle and Traffic Laws sets standards for routing of buses.[92] Franzen[93] states that routing is vitally important from the standpoint of good public relations. It is obvious that a successful transportation system must maintain routes that are satisfactory.

Table X is an example of the computations involved (see page 5). In the chi square formula for testing agreement between observed and expected results, the "f_o" is the frequency of occurrence of observed or experimentally determined facts and the "f_e" represents the expected frequency of occurrence on the hypothesis.[94] The chi square

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[92]Manual of Standards for the Transportation of Public School Pupils, op. cit., p. 13.

[93]Carl B. Franzen, "Balanced School Board Transportation Policies," American School Board Journal, vol. 129, 32-33, August, 1954.

[94]Garrett and Woodworth, op. cit., p. 253

TABLE X. QUESTION ONE: DID THE ROUTES CONTRIBUTE TO GOOD PUBLIC RELATIONS?*

	Answers		
	Favorable	Unfavorable	
Contracted Systems			
Observed (f_o)	21	1	22
Expected (f_e)	11	11	22
$(f_o - f_e)$	10	10	
$(f_o - f_e)^2$	100	100	
$\frac{(f_o - f_e)^2}{f_e}$	9.091	9.091	

$$\chi^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right] = 18.182 \quad df = 1 \quad .01 > P$$

	Favorable	Unfavorable	
Public Owned Systems			
Observed (f_o)	22	2	24
Expected (f_e)	12	12	24
$(f_o - f_e)$	10	10	
$(f_o - f_e)^2$	100	100	
$\frac{(f_o - f_e)^2}{f_e}$	8.333	8.333	

$$\chi^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right] = 16.666 \quad df = 1 \quad .01 > P$$

	Favorable	Unfavorable	
Other Systems			
Observed (f_o)	14	0	14
Expected (f_e)	7	7	14
$(f_o - f_e)$	7	7	
$(f_o - f_e)^2$	49	49	
$\frac{(f_o - f_e)^2}{f_e}$	7.000	7.000	

$$\chi^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right] = 14.000 \quad df = 1 \quad .01 > P$$

*Copied from questionnaire, see page 63.

in question one (see Table X) for contracted vehicles is 18.182. It is computed by subtracting the expected frequencies from the observed.[95] These differences are squared and divided by the expected number, and the sum of the quotients is the chi square.[96] Chi square is smallest when observed results are close to the expected; also the hypothesis is in closer agreement with the observed data.[97] The degrees of freedom are computed by subtracting one from number of rows in the table and multiplying this difference by the difference between one and the number of columns.[98] From Table E[99] we obtain the level of significance of chi square. As previously stated (see page 6), the .05 significance level has been accepted. It is evident the chi square for contracted systems is significant (see Table X); therefore, we reject the null hypothesis that no difference exists between expected and observed results (see page 6). We conclude that contracted routes do contribute to good public relations. It is apparent from Table X that all types of transportations systems' routes do contribute to good public relations.

To prevent the repetition of the chi square computations in this

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[95] Ibid.

[96] Ibid., pp. 253-254.

[97] Ibid., p. 254.

[98] Ibid.

[99] Ibid., p. 450.

text, Tables XI, XII, and XIII (pages 42-47) were prepared. Column one of each table lists the questions from the questionnaire. The second column holds the computed chi squares. The next column includes the probability from Table E and the last column presents whether or not the chi squares are significant at the .05 level. The second question of the questionnaire is concerned with the extent of safety precautions enacted for pupils in transit. Reeder[100] points out that in spite of every precaution which may be taken by school officials and employees, accidents sometimes occur. However, it is apparent that if safety precautions are enforced, pupil injuries in transit should be null. It is obvious from Tables XI - XIII, pages 42-47, that the chi squares are significant; therefore the null hypothesis is rejected and it is concluded that the various transportation systems did not have any pupils suffer injuries during the time in question.

Ruegsegger[101] devoted much of his transportation score card to the bus drivers and their qualifications. Questions four, eight, 12, and 20 ask information regarding the drivers. It will be noted on Tables XI, XII, XIII (pages 42-47) that driver's tenure was continuous only with the "other systems." All the various transportation systems reported that mechanics were not drivers, the driver did not possess previous commercial driving experience, and that their drivers'

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[100] Reeder, op. cit., p. 427.

[101] Butterworth and Ruegsegger, loc. cit.

TABLE XI. QUESTIONNAIRE COMPUTATIONS FOR CONTRACTED SCHOOL TRANSPORTATION SYSTEMS IN PARAMETER

Questions	Chi square	P	Significant @ 5% level
1. Did the routes contribute to good public relations?	18.182	.01 > P	Significant
2. Did any pupils suffer injuries in transit?	22.000	.01 > P	Significant
3. Were any buses suspended from service by the State Department during the time in question?	22.000	.01 > P	Significant
4. Was average bus driver's tenure continuous since organization of routes or district?	2.908	.10 > P > .05	Not Significant
5. Were special bus bodies provided for special students (i.e. special wheel chair landings)?	14.728	.01 > P	Significant
6. Should there have been revisions in the transportation systems?	5.200	.02 > P > .01	Significant
7. Were teacher chaperons required for buses transporting students to out-of-town athletic events, etc.?	.182	.70 > P > .50	Not Significant
8. Did the drivers average more than five years previous experience in commercial driving?	.000	P > .95	Not Significant
9. Do you estimate that the best possible transportation was received for the expenditures?	6.726	.01 > P	Significant
10. Would you have desired a more rigid control of the transportation system?	6.905	.01 > P	Significant

TABLE XI. (Continued)

Questions	Chi square	P	Significant @ 5% level
11. Was student behavior on buses a contributing factor to the success of the system?	5.800	.02 > P > .01	Significant
12. Were mechanics the main source of drivers?	17.190	.01 > P	Significant
13. Were buses overloaded?	14.728	.01 > P	Significant
14. Was storage provided for buses?	4.262	.05 > P > .02	Significant
15. Were all routes less than one hour duration from time of departure to arrival?	8.908	.01 > P	Significant
16. Did one or more buses make more than one trip (serve two or more routes)?	6.544	.02 > P > .01	Significant
17. Were heated and supervised shelters provided for all students who had to wait?	17.190	.01 > P	Significant
18. Were ten or more tardy trips encountered?	11.636	.01 > P	Significant
19. Were any bus trips missed because of conditions other than general weather conditions?	10.714	.01 > P	Significant
20. Was the average driver's character acceptable?	22.000	.01 > P	Significant

TABLE XII. QUESTIONNAIRE COMPUTATIONS FOR PUBLIC OWNED TRANSPORTATION SYSTEMS IN PARAMETER

Questions	Chi square	P	Significant @ 5% level
1. Did the routes contribute to good public relations?	16.667	.01 > P	Significant
2. Did any pupils suffer injuries in transit?	20.166	.01 > P	Significant
3. Were any buses suspended from service by the State Department during the time in question?	20.166	.01 > P	Significant
4. Was average bus driver's tenure continuous since organization of routes or district?	.667	.50 > P > .30	Not Significant
5. Were special bus bodies provided for special students (i.e. special wheel chair landings)?	16.667	.01 > P	Significant
6. Should there have been revisions in the transportation systems?	8.333	.01 > P	Significant
7. Were teacher chaperons required for buses transporting students to out-of-town athletic events, etc.?	20.166	.01 > P	Significant
8. Did the drivers average more than five years previous experience in commercial driving?	.044	.90 > P > .80	Not Significant
9. Do you estimate that the best possible transportation was received for the expenditures?	20.166	.01 > P	Significant
10. Would you have desired a more rigid control of the transportation system?	18.182	.01 > P	Significant

TABLE XII. (Continued)

Questions	Chi square	P	Significant @ 5% level
11. Was student behavior on buses a contributing factor to the success of the system?	8.934	.01 > P	Significant
12. Were mechanics the main source of drivers?	20.166	.01 > P	Significant
13. Were buses overloaded?	15.696	.01 > P	Significant
14. Was storage provided for buses?	15.696	.01 > P	Significant
15. Were all routes less than one hour duration from time of departure to arrival?	18.180	.01 > P	Significant
16. Did one or more buses make more than one trip (serve two or more routes)?	19.174	.01 > P	Significant
17. Were heated and supervised shelters provided for all students who had to wait?	16.200	.01 > P	Significant
18. Were ten or more tardy trips encountered?	12.566	.01 > P	Significant
19. Were any bus trips missed because of conditions other than general weather conditions?	8.934	.01 > P	Significant
20. Was the average driver's character acceptable?	19.174	.01 > P	Significant

TABLE XIII. QUESTIONNAIRE COMPUTATIONS FOR OTHER SCHOOL TRANSPORTATION SYSTEMS IN PARAMETER

Questions	Chi square	P	Significant @ 5% level
1. Did the routes contribute to good public relations?	14.000	.01 > P	Significant
2. Did any pupils suffer injuries in transit?	14.000	.01 > P	Significant
3. Were any buses suspended from service by the State Department during the time in question?	14.000	.01 > P	Significant
4. Was average bus driver's tenure continuous since organization of routes or district?	10.286	.01 > P	Significant
5. Were special bus bodies provided for special students (i.e. special wheel chair landings)?	14.000	.01 > P	Significant
6. Should there have been revisions in the transportation systems?	1.142	.30 > P > .20	Not Significant
7. Were teacher chaperons required for buses transporting students to out-of-town athletic events, etc.?	2.572	.20 > P > .10	Not Significant
8. Did the drivers average more than five years previous experience in commercial driving?	.076	.80 > P > .70	Not Significant
9. Do you estimate that the best possible transportation was received for the expenditures?	7.428	.01 > P	Significant
10. Would you have desired a more rigid control of the transportation system?	2.560	.20 > P > .10	Not Significant

TABLE XIII. (Continued)

Questions	Chi square	P	Significant @ 5% level
11. Was student behavior on buses a contributing factor to the success of the system?	.792	.50 > P > .30	Not Significant
12. Were mechanics the main source of drivers?	13.000	.01 > P	Significant
13. Were buses overloaded?	10.286	.01 > P	Significant
14. Was storage provided for buses?	2.560	.20 > P > .10	Not Significant
15. Were all routes less than one hour duration from time of departure to arrival?	2.572	.20 > P > .10	Not Significant
16. Did one or more buses make more than one trip (serve two or more routes)?	2.572	.20 > P > .10	Not Significant
17. Were heated and supervised shelters provided for all students who had to wait?	13.000	.01 > P	Significant
18. Were ten or more tardy trips encountered?	14.000	.01 > P	Significant
19. Were any bus trips missed because of conditions other than general weather conditions?	7.142	.01 > P	Significant
20. Was the average driver's character acceptable?	14.000	.01 > P	Significant

characters were acceptable. Reeder[102] points out that driver turnover results in needless expense and reduced efficiency; also he acclaims the causes are inadequate salaries, competitive bidding, short contracts, and selection of drivers. Jack Pollack[103] states that bus drivers are housewives, teachers, lunchroom employees and other occupations; therefore question 12 is meaningless and should have been excluded from the questionnaire. State requirements forbid drivers who have immoral characters and do not exercise good influence over the pupils.[104]

Comparing the responses on questions 3, 13, and 14 dealing with bus efficiency, we find that contracted and public owned responded similiarly (see Tables XI-XIII, pages 42-47). From the above tables it is obvious that bus suspension by the state department was not encountered and buses were not overloaded. "Other systems" reported a lack of adequate storage for their buses (see Table XIII, pages 46-47). Featherston [105] claims the North needs storage space for buses and the Minnesota Statutes[106] dictate that conveyances must be sheltered at all times when not in actual use.

It is expected that the transportation systems would practice

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[102]Reeder, op. cit., p. 411.

[103]Pollack, op. cit., p. 157.

[104]Manual of Standards for the Transportation of Public School Pupils, op. cit., p. 4.

[105]Featherston, op. cit., pp. 146-149.

[106]Manual of Standards for the Transportation of Public School Pupils, op. cit., p. 6.

proper care and have equipment needed for special students. This is not the case. The computations for question five dealing with this service indicate the absence of special student equipment from all the systems (see Tables XI-XIII, pages 42-47). The remaining questions dealing with student supervision and convenience services are 7, 11, and 17. Contracted transportation systems did not require teacher chaperons on special bus trips; however, public owned and "other systems" did require this service of their teachers (see Tables XI-XIII, pages 42-47). Both contracted and public owned systems have a significant chi square on transported student behavior. The "other systems" reported that student behavior did not contribute to the success of their transportation (see Table XIII, page 47). According to Reeder[107] waiting stations may be provided for the convenience of the students. It was found that shelters were not provided for students by any of the systems (see Tables XI-XIII, pages 42-47).

The aspect of administration satisfaction involves questions 6, 9, 10, 18, and 19. From the Tables XI-XIII, it is evident that contracted and public owned systems are very content with their setups. It was found that only "other systems" desired revision in their transportation and desired a more rigid control over the system. None of the systems reported encounter of tardy trips or trips missed because of conditions other than general weather (see questions 18 and 19, Tables XI-XIII, pages 42-47). All systems were in agreement that the best

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[107]Reeder, op. cit., p. 405.

transportation was received for the expenditures (see Tables XI-XIII).

"Other systems" reported that routes exceeded one hour and buses did serve more than one route (see question 15 and 16, Tables XI-XIII). Both contracted and public owned systems responded these conditions were not encountered.

In summary, public owned transportation systems were able to operate with less expenditures than any of the other school transportation systems (see page 27). The public owned systems maintained vehicles of greater capacity (see page 31), had the least number of routes, and transported more students per route (see page 38) than either of the two remaining types recorded in this study. The survey questionnaire revealed all transportation systems maintained satisfactory routes (see page 40) and practices adequate safety precautions (see page 41). School bus efficiency was reported similar for contracted and public owned school transportation systems (see page 48). The "other systems" did not provide storage for their buses (see page 48). Equipment for special students was inadequate for all the systems of transportation (see page 49). Transported students behavior was satisfactory for both contracted and public owned systems; however, "other systems" reported discontent with the behavior of their transit students (see page 49). Public owned systems required teacher-chaperons on field trips, and athletic events; however, schools maintaining contracted and "other systems" did not require this service (see page 49). Waiting stations were not provided by any of the school transportation systems (see page 49). Administrators of contracted and

public owned transportation systems reported satisfaction with their present facilities (see pages 49 and 50). "Other systems" routes were more than one hour duration and buses served more than one route (see page 50). Administrators of "other systems" desired more control of their transportation (see page 49). Contracted and public owned reported a lack of school bus driver's tenure (see page 41). All systems reported driver's character as acceptable and that the drivers did not have previous commercial driving experience (see page 41).

CHAPTER IV

SUMMARY, RECOMMENDATIONS, AND INFORMATION FOR FURTHER STUDY

Summary

The following is a list of the conclusions of this study:

(1) Public owned systems are the most economical.

(2) Administrators express equal satisfaction with their respective systems.

(3) School bus efficiency was reported very similar; however, state transportation records reveal public owned systems averaged larger conveyances, less routes, and more students per route.

(4) Convenience services for transported students were almost identically reported.

Response variation for contracted and public owned systems was almost nil. The only difference was reported on question seven asking if teacher chaperons were required for special event bus trips. Public owned responses for this question computed a very significant chi square; whereas the reverse was found for contracted systems.

Significant chi squares at the 5% level for contracted and public owned systems were found for the following questions:

(1) The routes do contribute to good public relations.

(2) Pupils did not suffer injuries in transit.

(3) No buses were suspended from service by the state department.

(5) Special bus bodies were not provided for special students.

(6) Transportation revisions were not desired.

(9) The best transportation for expenditures was experienced.

(10) More rigid control was not desired.

(11) Student behavior was satisfactory.

(12) Mechanics were not bus drivers.

(13) Buses were not overloaded.

(14) Storage was provided for buses.

(15) The routes were less than one hour duration.

(16) No buses served more than one route.

(17) Heated and supervised shelters were not provided for students.

(18) Tardy trips were not encountered.

(19) Bus trips were not missed because of conditions other than general weather.

(20) The average driver's character was acceptable.

Question four and eight did not show significant chi-squares for both the contracted and public owned transportation systems; therefore, it was concluded bus driver's tenure was not continuous and the drivers did not have previous commercial driving experience.

"Other systems" responses deviated from the remaining systems on questions 4, 6, 10, 11, 14, 15, and 16. "Other systems" differed from the remaining systems in that they desired transportation revisions, wanted more rigid control, transported student behavior was undesirable, storage was not provided, bus routes exceeded one hour, and buses were

required to make more than one trip. The rest of the questions responses were similar, except question seven. "Other systems" responses for question seven did not show a not significant chi square and the conclusion was teacher chaperons were not required for special event bus trips.

Recommendations

It is evident by this study that both public owned and contracted school transportation systems are successful and are operating satisfactorily in their communities. It is apparent that for schools in this parameter a flexible transportation system is also satisfactory. Each of the various systems represented has ample successful qualities. It would be impossible to recommend any one type of transportation system on the basis of the findings of this study. Development of a particular transportation system requires the satisfaction of a particular community. The community should be surveyed to determine its resources and needs. Further, the potential expenditures should be evaluated in light of the extent and quality of service required, demanded, and desired.

Implications for Further Study

There undoubtedly should be a follow-up of this study. Negative, unfavorable, and unanswered responses should be analyzed. It would be advisable to devise a questionnaire for lay people, school board members, and students of the various transportation systems in order

to approach the satisfactory phase from all view points. Special attention should be devoted to cost items involved in the various systems to determine what one is more economical than the other.

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APPENDIX

STATE OF MINNESOTA
Department of Education
Department of Administration

Code VII-C-5
Revised July 1, 1956

SCHOOL BUS DRIVER'S CONTRACT

_____School District No. _____ of _____ County or
(Write in legal name of School District - Minnesota Statutes, Section 122.01)

Counties, Minnesota, agrees with_____ herein called the driver

as follows:

1. The driver shall transport_____ (number) public school pupils as designated by the school board and operate the school bus over route number_____ as specified by the School Board, for a term of one school year of_____school months, commencing on the_____ day of_____, 19___, for the sum of_____ dollars per school month, payable monthly. The compensation specified in this contract shall cover the transportation of pupils for one round trip per school day to and from public school.

2. The driver shall comply with the rules and regulations adopted by the State Board of Education and the school board and make such reports to the school board as are required by such rules and regulations.

3. The driver agrees to attend one county or regional school bus drivers' school of instruction and to take the vehicle used for the transportation of pupils to a meeting for inspection when such meeting is called by the State Department of Education.

4. The said School Board agrees to give two weeks' written notice to said driver in case the course of the route is changed. In such case the said driver reserves the right to terminate the agreement.

5. The said driver agrees_____

_____

_____

_____

Do Not Write In This Space

Dated_____, 19_____

_____ School District No._____

of_____ County

_____ Chairman

_____ Clerk

_____ Treasurer

_____ Driver

DRIVER'S BOND

STATE OF MINNESOTA)
) ss
COUNTY of_____)

KNOW ALL MEN BY THESE PRESENTS, That we,_____(driver) as principal, and _____ as sureties of _____ County, Minnesota, are held and firmly bound unto School District No._____in the County of_____, State of Minnesota, in the full sum of _____ dollars (_____) lawful money of the United States, to which payment, well and truly to be made, we bind ourselves jointly and severally, our joint and several heirs, executors and administrators firmly by these presents.

IN WITNESS WHEREOF, We have hereunto set our hands and seals this _____ day of _____, A. D. 19___.

The condition of the foregoing is such, that whereas the above bonded_____ _____ has on this _____ day of _____, A. D. 19___, entered into a contract to and with the school board of the School District No. _____ in the County of_____ and the State of Minnesota, for the transportation of school children to and from the schools of said district as in said contract provided; which said contract is hereinafter set forth and is hereby specifically referred to and made a part hereof.

Now, therefore, if the said _____(driver) shall well and faithfully perform all and each of the conditions named in said contract by him to be kept and performed in the manner and time therein mentioned and set forth, then this obligation to be void, otherwise it shall remain in full force and effect.

Signed, Sealed and Delivered in Presence of

_____ _____(Seal)

_____ _____(Seal)

_____ _____(Seal)

STATE OF MINNESOTA)
) ss
COUNTY of _____)

_____

_____

came personally before me, and being each duly sworn, did each for himself depose and say that he is one of the sureties above named and that he a resident and freeholder of the State of Minnesota, and worth _____ dollars (_____) over and above all his debt and liabilities, in unencumbered property situated within the said state, exclusive of property exempt from execution.

_____

_____

Sworn and subscribed to before me this _____ day of _____, A. D. 19_____

_____

Notary Public_____ County, Minn.

My commission expires _____, 19____

This contract and bond were approved at a meeting of the School Board on _____, 19___, and such action duly recorded in the clerk's records.

_____Clerk.

615 2nd Street, S W
Pipestone, Minnesota
February 16, 1959

Superintendent of Schools
Public High School
Minnesota

Dear Sir:

I, at the present time, am working on a Master of Science Degree at South Dakota State College; where I am enrolled in Education 299: Thesis in Education.

I have chosen as my problem the following: "A Comparison of Public Owned and Private Owned School Transportation Systems of the Minnesota State High League, Region Number II." This study involves cost, efficiency, and satisfaction comparisons. The enclosed questionnaire is designed to accommodate the efficiency and satisfaction aspects of this study.

Increased school population, tendency towards consolidated schools, and school activity trips has mushroomed this part of the administrator's duties. Research is urgent to meet the needs of this mobilization trend in the school systems.

To facilitate the requirements of the above mentioned course it would be appreciated if you would complete the enclosed questionnaire and return it to the undersigned in the self-addressed envelope.

This project has the approval and support of Dr. Harry E. Huls, Graduate Advisor, of the Education Department.

I cannot express my appreciation and thanks enough to you for your cooperation and assistance in this project.

Respectfully yours,

Enclosure

Roger W. Cook

615 2nd Street, SW
Pipestone, Minnesota

Superintendent of Schools
Public High School
Minnesota

Dear Sir:

A short time ago I contacted you through mail requesting pertinent data for my thesis: "A Comparison of Public Owned and Private Owned School Transportation Systems of the Minnesota State High League, Region Number II." This study involves cost, efficiency, and satisfaction comparisons. The enclosed questionnaire is designed to accommodate the efficiency and satisfaction aspects of this study.

Increased school population, tendency towards consolidated schools, and school activity trips has mushroomed this part of the administrator's duties. Research is urgent to meet the needs of this mobilization trend in the school systems.

No doubt pressing events have detained your reply. It is hoped that this correspondence will find affairs such that your cooperation can be received.

I cannot express my appreciation and thanks enough to you for your cooperation and assistance in this project.

Respectfully yours,

Roger W. Cook

Enclosure

DIRECTIONS: Please answer items on the questionnaire by placing X in the appropriate yes or no blank. The line following each question is provided for comments or explanations you may wish to contribute. If a question does not apply to your system, leave blank. (The questions are directed to your 1957-58 transportation system).

	YES	NO
1. Did the routes contribute to good public relations?	____	____
2. Did any pupils suffer injuries in transit (1957-58)?	____	____
3. Were any buses suspended from service by the State Department during the time in question?	____	____
4. Was average bus driver's tenure continuous since organization of routes or district?	____	____
5. Were special bus bodies provided for special students (i.e. special wheel chair landings)?	____	____
6. Should there have been revisions in the transportation system?	____	____
7. Were teacher chaperons required for buses transporting students to out-of-town athletic events, etc.?	____	____
8. Did the drivers average more than five years previous experience in commercial driving?	____	____
9. Do you estimate that the best possible transportation was received for the expenditures?	____	____

	YES	NO
10. Would you have desired a more rigid control of the transportation system?	___	___
11. Was student behavior on buses a contributing factor to the success of the system?	___	___
12. Were mechanics the main source of drivers?	___	___
13. Were buses overloaded?	___	___
14. Was storage provided for buses?	___	___
15. Were all routes less than one hour duration from time of departure to arrival?	___	___
16. Did one or more buses make more than one trip (serve two or more routes)?	___	___
17. Were heated and supervised shelters provided for all students who had to wait?	___	___
18. Were ten or more tardy trips encountered?	___	___
19. Were any bus trips missed because of conditions other than general weather conditions?	___	___
20. Was the average driver's character acceptable?	___	___