An Overview of Pennsylvania Public School Transportation

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EXECUTIVE SUMMARY

This study analyzed Pennsylvania Department of Education data from 2013-14 to 2017-18 to examine changes in school enrollment, transportation ridership, and transportation finances at the state level and by rural and urban location. It quantified changes in the number of service providers to learn more about the current school transportation structure in Pennsylvania. The research also analyzed crash data published by the Pennsylvania Department of Transportation between 2013 and 2018 to evaluate the safety of public school transportation in Pennsylvania.

Key Findings

- Declines in school enrollment were relatively gradual in urban school districts but more severe in rural school districts.
- On average, 95.8 percent of rural public school students relied on public school transportation between 2013-14 and 2017-18.
- Transporting fewer students over large areas or longer distances drives up the cost per student transported in rural school districts.
- More school districts were seeking independent contractors for all or some of their transportation services during the study period.
- The continued decline in the number of transportation service providers in the "contracted service with contractor" category (vs. contracted service with a parent/individual or another Local Education Agency) may lead to an increased market share for some larger contractors.

Introduction

This study analyzed Pennsylvania Department of Education data from 2013-14 to 2017-18 to examine changes in school enrollment, transportation ridership, and transportation finances at the state, rural, and urban levels. It quantified changes in the number of service providers to learn more about the current school transportation structure in Pennsylvania. The research also analyzed crash data published by the Pennsylvania Department of Transportation between 2013 and 2018 to evaluate the safety of public school transportation in Pennsylvania. These analyses provide an overview of Pennsylvania public school transportation over a 5 year period.

From 2013-14 to 2017-18, school enrollment and transportation ridership decreased by 4.6 percent and 5.0 percent, respectively, in rural school districts. Urban school districts saw a 1.3 percent decline in enrollment, and a 1.4 percent increase in transportation ridership. As a result of inequivalent changes between rural and urban school districts, Pennsylvania experienced a 2.2 percent decrease in school enrollment, and a 0.4 percent decrease in transportation ridership. The enrollment decline was relatively gradual in urban districts but more severe in rural districts.

A downward trend in nonpublic school ridership and an upward trend in charter school ridership co-existed at the state, rural, and urban levels. Rural school enrollment was lower than total pupils transported during the study period because of nonpublic and charter school ridership. On average, nonpublic and charter school students accounted for 5.3 percent of total pupils transported in rural school districts and 16.9 percent in urban school districts. More importantly, on average, 95.8 percent of rural public school students relied on public school transportation during the study period.

The continuous decline in enrollment and the steady rise in transportation costs, unsurprisingly, caused a statewide increase of 10.7 percent in costs per student transported during the study period. From 2013-14 to 2017-18, the statewide, rural, and urban average costs per pupil transported were about $953, $984, and $941, respectively. On average, rural school districts received 39.5 percent of the total state transportation subsidy over the study period. However, 59.1 percent of rural transportation costs were subsidized by the state. Transporting fewer students over large areas or longer distances drives up the cost per student transported in rural school districts.

Noticeable changes in the structure of school transportation service providers were identified over the 5 year study period. First, contracted transportation service with another Local Education Agency (LEA) increased by 292.3 percent. Second, the number of school districts that provide LEA-owned transportation services decreased by 8.3 percent. These two changes indicate that more school districts were seeking independent contractors for all or some of their transportation services during the study period. Third, contracted transportation services with parents or other individuals decreased by 11.3 percent. The continuous decline in the number of service providers in the contracted service with a contractor category may lead to an increased market share for some larger contractors.

Finally, the results from the school transportation safety analysis revealed that school bus crashes were concentrated in urban school districts but scattered among rural school districts. During the study period, among all school-bus-crash-induced fatalities, one was a school bus driver, and one was a school-age pedestrian. The total number of school bus crashes fluctuated between 2013 and 2018, with an overall downward trend.

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INTRODUCTION

According to the Pennsylvania Department of Education (PDE), Pennsylvania's 500 school districts range in size from 200 students to more than 140,000 students. Except for charter school students, Pennsylvania law does not require a school district to provide transportation to its students. However, if a school district provides transportation to its students, it shall also provide transportation to nonpublic pupils (Public School Code of 1949 Act 14, Section 1361[1]). Pennsylvania Public School Code of 1949 Section 1726-A[2] mandates school districts to provide transportation to charter school students, including transportation based on the charter school's operating schedule, and up to 10 miles outside of the district's boundary. Although school districts are eligible to receive reimbursements from the state, with public school financial resources usually running low or short already, this "10-Mile Law" stresses many school districts in Pennsylvania (Peterson, 2013).

A school district that provides transportation to one or more students is entitled to receive reimbursement from the state (Public School Code of 1949, Section 2541[3]). The reimbursement amount, or the state subsidy, is determined by a series of calculations. The process of requesting reimbursement from the state involves a tremendous amount of paperwork. First, each school district needs to calculate the total reimbursable cost with the formula presented below. Notice the vehicle cost deduction is only calculated for Local Educational Agency (LEA) owned vehicles.

$$\underline{\text{Total Reimbursable Cost} = \text{Total Allowance} \times \text{Cost Index} - \text{Vehicle Cost Deduction}}$$

The cost index is an annual number used by PDE to adjust for inflation. This annual adjustment is determined in the calendar year based on fluctuations in consumer price index published by the U.S. Department of Labor (22 Pa. Code § 23.39). The total allowances are calculated as the sum of vehicle allowance, mileage allowance, utilized passenger capacity mileage allowance, and excess hours allowance. Second, school districts need to multiply the total reimbursable cost by the market value aid

[1] Section 1361 amended May 11, 1979, P.L.26, No.7
[2] Section 1726-A amended July 9, 2008, P.L.846, No.61
[3] Section 2541 amended Nov. 20, 1979, P.L.465, No.97

ratio to calculate a draft pupil transportation subsidy. The market value aid ratio varies from one school district to another. It is an index used by PDE to differentiate the relative wealth of a region where a school district resides. If a school district's market value aid ratio is less than 0.5, then the calculation of the pupil transportation subsidy follows a different set of equations. For simplicity reasons, if a school district's aid ratio is less than 0.5, the calculation of the pupil transportation subsidy is separated into three parts – nonpublic subsidy, hazardous subsidy, and public non-hazardous subsidy. Third, school districts need to apply applicable adjustments, such as depreciation and/or excess transportation costs, to finalize the pupil transportation subsidy. Finally, a school district receives an additional subsidy, $385 per pupil (Public School Code of 1949, Section 2509.3[4]), for transporting eligible nonpublic and charter school students.

Public school transportation is a complex and expensive problem for many school districts. From 2006-07 to 2015-16, the national average cost per pupil transported (in unadjusted dollars) increased by 19.4 percent (Digest of Education Statistics, 2018). The Pennsylvania Department of the Auditor General's office issued a report in May 2016 and stated that 19 Pennsylvania school districts spent $54.8 million more than state transportation reimbursement provided (Pennsylvania Department of the Auditor General, 2016). The rising cost of public school transportation catches attention from parents, researchers, school districts, government officials, and many more across the nation.

To cope with the rising cost of public school transportation, the Pennsylvania Auditor General's office suggested certain practices such as contract bidding and regular auditing (Pennsylvania Department of the Audit General, 2016, 2019). Many researchers also suggest streamlining the operations of public school transportation by using centralized transfer stations (Park and Kim, 2009), optimizing schools' start times (Bertsimas et al., 2019), and implementing school bus routing optimization (William et al., 2015). Although these suggestions proved to be effective, research on public school transportation in rural school districts across the nation deserves more attention. Moreover, there is a lack of research that adopts a

[4] Section 2509.3 amended June 29, 2002, P.L.524, No.88.

systematic approach to review public school transportation to assist in policy making/changing or referencing. This research aims to fill the gap and provide an overview of public school transportation in Pennsylvania.

GOALS AND OBJECTIVES

The purpose of this study was to provide an overview of public school transportation in Pennsylvania over the last 5 years (2013-14 to 2017-18) to achieve the following goals. Each goal was further expressed as specific objectives.

Goal 1. Identify changes and trends in school enrollment and transportation ridership at state, urban and rural levels.

Goal 2. Examine transportation finances at state, urban, and rural levels.

- Identify total transportation costs for each school district;
- Identify total transportation subsidies for each school district;
- Identify percent of school transportation covered by the state subsidies for each school district;
- Calculate expense per student transported for each school district;
- Aggregate transportation finances at state, urban, and rural levels to identify changes in total transportation costs and total transportation subsidies over the last 5 years; and
- Report on cost per student transported at state, urban and rural levels.

Goal 3. Evaluate the safety of public school transportation over the last 5 years.

- Collect data from the Pennsylvania Department of Transportation (PennDOT) to report school bus crash injuries and school bus crashes.

Goal 4. Identify transportation service providers to gain knowledge about the current school transportation structure in Pennsylvania.

- Identify total number of public school transportation service providers and stratify by numbers into types defined by PDE; and

- Compute percentage changes in each type of service provider over the last 5 years and identify relevant trends associated with service providers.

Goal 5. Comparison of rural and urban public school transportation.

- Report on the differences between urban and rural public school transportation based on enrollment, school district geographic size, and local wealth.
- Evaluate trends and challenges to determine their impacts on rural as well as urban school districts.

METHODOLOGY

This study included a literature review, data collection and processing, quantitative analysis of public school transportation, and visualization of changes and trends that occurred among school districts in Pennsylvania from 2013-14 to 2017-18. Qualitative and quantitative methods were used in concert to accomplish the study goals.

The purpose of the literature review was to obtain recent and relevant information about public school transportation in Pennsylvania. Data published by PDE was collected to perform the following analyses.

- Analysis of changes and trends in school enrollment and transportation ridership;
- Analysis of transportation finances that are categorized into: total transportation cost[5], total transportation subsidies[6] (state), percent of school transportation covered by the state subsidies, and cost per student transported[7];
- Inferential statistical analysis of cost per pupil transported by status (rural vs. urban), by school district geographic size, and by local wealth; and
- Quantification of the number of school transportation service providers categorized into three types defined by PDE.

[5] Function 2700 reported in the Annual Financial Report published by PDE.
[6] Total transportation subsidies are the sum of pupil transportation subsidy and nonpublic and charter school pupil transportation subsidy.
[7] Cost per student transported is calculated as total transportation cost divided by total students transported.

Based on the Center for Rural Pennsylvania's definition, 235 school districts are rural. In this study, a charter school (or a nonpublic school) was defined as rural/urban if its student transportation was provided by a rural/urban school district.

Data were first processed at the school district level, then aggregated at the rural, urban, and state levels, with descriptive analyses to identify changes and trends in public school transportation in Pennsylvania. Inferential analyses were performed at the aggregated levels to evaluate the differences in cost per student transported between rural and urban school districts based on geographic size, enrollment, and local wealth.

To quantify the number of transportation service providers in each category, the researcher processed 14,640 records to eliminate variations in the reported names of service providers. The number of distinct service providers in each category was generated. Descriptive analyses were performed to assess changes in the number of service providers in each category over the study period.

Crash data published by PennDOT between the calendar year 2013 and 2018 were collected to assess public school transportation safety. A map indicator with the location of school bus crashes from 2013 to 2018 was provided to visualize the tendency of school bus crashes. Furthermore, data related to school bus crash fatalities and school bus crash injuries between 2013 and 2018 were examined and tabulated to evaluate the safety of public school transportation during the study period.

RESULTS

Analysis of School Enrollment and Transportation Ridership

From 2013-14 to 2017-18, Pennsylvania experienced a 2.2 percent decrease in school enrollment and a 0.4 percent decrease in transportation ridership (as shown in Table 1). The enrollment decline was relatively gradual in urban school districts but more severe in rural school districts. The public school transportation ridership increased in urban school districts but decreased in rural school districts. During the study period, rural school districts underwent a reduction in both school enrollment and transportation ridership, 4.6 percent and 5.0 percent, respectively. In addition, because of nonpublic and charter school

transportation, rural school enrollment was lower than total pupils transported over the study period.

Table 1. Changes in School Enrollment and Ridership

School Year	School Enrollment			Total Pupils Transported		
	Rural	Urban	State	Rural	Urban	State
2013-14	412,677	1,192,615	1,605,292	417,417	1,073,816	1,491,233
2014-15	405,877	1,183,563	1,589,440	411,463	1,077,052	1,488,515
2015-16	401,722	1,180,535	1,582,257	407,009	1,078,984	1,485,993
2016-17	398,607	1,179,852	1,578,459	403,114	1,080,635	1,483,749
2017-18	393,528	1,176,533	1,570,061	396,624	1,088,815	1,485,439
Change	**-4.6%**	**-1.3%**	**-2.2%**	**-5.0%**	**1.4%**	**-0.4%**

Source: Pennsylvania Department of Education, 2013-14 to 2017-18

Except for charter school students, Pennsylvania law does not require a school district to provide transportation to its students. However, if a school district provides transportation to its students, it shall also provide transportation to nonpublic pupils (Public School Code of 1949 Act 14, Section 1361[8]). To evaluate the transportation needs among students enrolled in public schools, the research compared total public school pupils transported as the percentage of school enrollment at state, rural and urban levels between 2013-14 and 2017-18 (See Table 2). On average, 95.8 percent of rural public school students relied on public school transportation during the study period.

Table 2. Total Public Pupils Transported as Percent of School Enrollment

School Year	Rural	Urban	State
2013-14	95.9%	74.6%	80.1%
2014-15	96.1%	75.5%	80.7%
2015-16	96.0%	76.0%	81.1%
2016-17	95.7%	76.1%	81.1%
2017-18	95.4%	77.2%	81.8%
5-Year Average	**95.8%**	**75.9%**	**81.0%**
Change	**-0.5%**	**3.6%**	**2.2%**

Source: Pennsylvania Department of Education, 2013-14 to 2017-18

[8] 1361 amended May 11, 1979, P.L.26, No.7

Analysis of Nonpublic and Charter School Ridership

Changes in nonpublic and charter school ridership between 2013-14 and 2017-18 were examined (See Table 3). Information derived from Table 1 and Table 3 indicates that, on average, nonpublic and charter school students accounted for 5.3 percent of total pupils transported in rural school districts and 16.9 percent in urban school districts. From 2013-14 to 2017-18, statewide nonpublic ridership decreased by 9.9 percent, but charter school ridership increased by 16.4 percent. Table 3 shows that a downward trend in nonpublic ridership and an upward trend in charter school ridership existed in both rural and urban school districts during the study period.

Table 3. Changes in Nonpublic and Charter School Ridership

School Year	Total NonPublic Pupils Transported			Total Charter School Pupils Transported		
	Rural	Urban	State	Rural	Urban	State
2013-14	19,533	127,283	146,816	2,256	57,021	59,277
2014-15	19,313	122,898	142,211	2,212	60,726	62,938
2015-16	19,265	119,104	138,369	2,220	62,346	64,566
2016-17	19,229	118,525	137,754	2,273	63,833	66,106
2017-18	18,899	113,349	132,248	2,342	66,672	69,014
Change	**-3.2%**	**-10.9%**	**-9.9%**	**3.8%**	**16.9%**	**16.4%**

Source: Pennsylvania Department of Education, 2013-14 to 2017-18

The results from the correlation analysis[9] reveal that, at the state level, as school enrollment decreases, total pupils transported decreases, nonpublic ridership decreases, but charter school ridership increases. Similar trends were found at the rural level. However, the relationship between rural enrollment and rural charter school ridership is not statistically significant. At the urban level, as school enrollment decreases, total pupils transported increases, total nonpublic ridership decreases, and total charter school ridership increases.

The continuous increase in charter school ridership may have fiscal impacts on school districts with

[9] See Appendix A for details about the correlation analysis performed.

higher proportions of charter school enrollment (Nordan, 2017, Ladd and Singleton, 2018). Appendix B shows the number of charter schools by county in Pennsylvania.

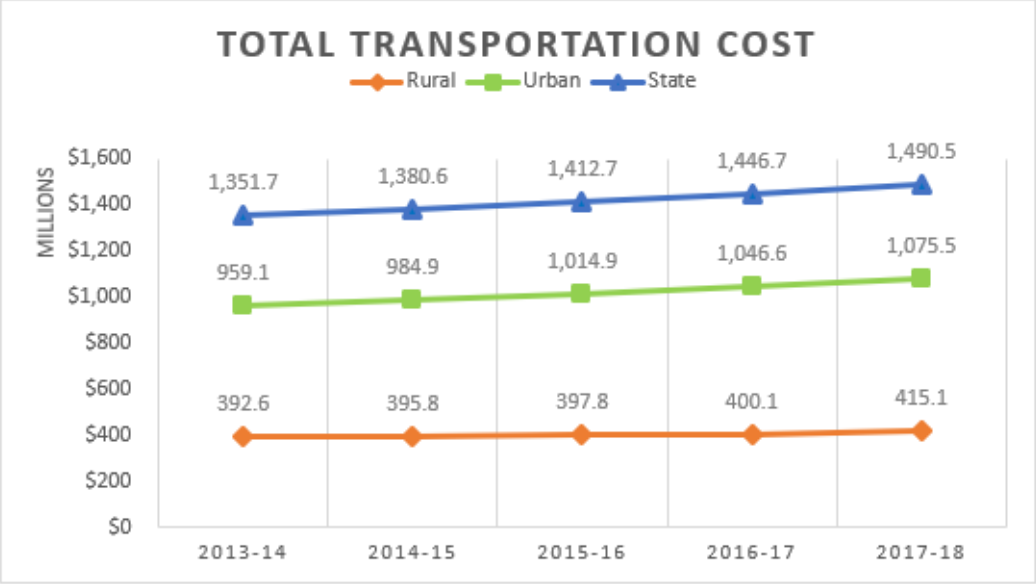
Analysis of Transportation Finances

Transportation expenditures published by PDE in the Annual Financial Report are unadjusted dollar amounts. However, the formulas used by PDE to calculate transportation subsidies include an annual cost index to adjust for inflation. For consistency reasons, cost figures in this study were not adjusted.

Total Transportation Costs and Total Transportation Subsidies

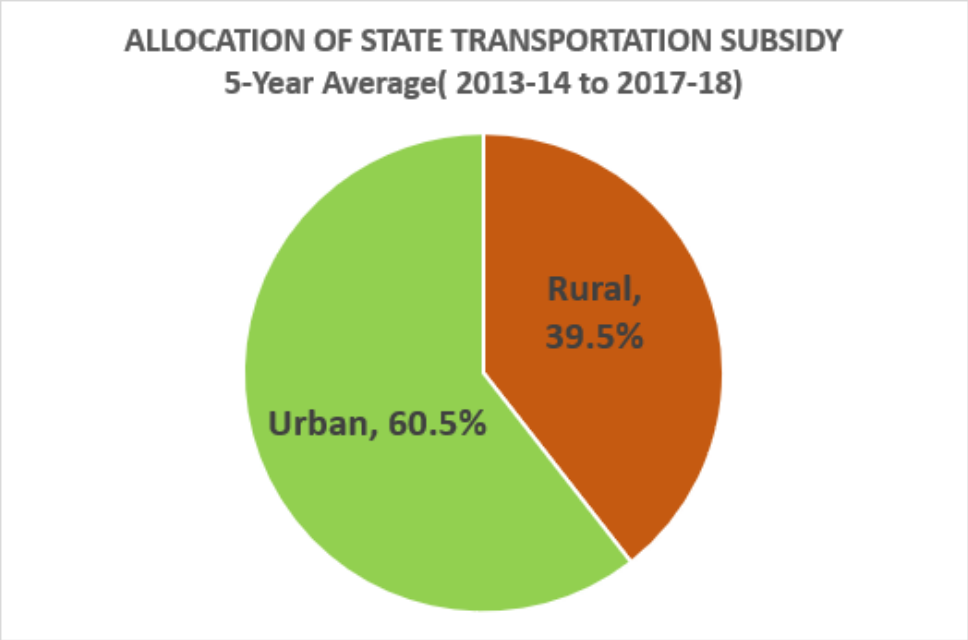
Figure 1 illustrates changes in total transportation costs and Figure 2 shows the allocation of total state transportation subsidies between 2013-14 and 2017-18. On average, rural school districts received 39.5 percent of the total state transportation subsidy over the study period. Notice the $10.7 million increase in total transportation subsidy between 2016-17 and 2017-18 was caused by the increase in total transportation cost during that time.

Figure 1. Comparison of Total Transportation Cost



Source: Pennsylvania Department of Education, 2013-14 to 2017-18

Figure 2. Allocation of State Public School Transportation Subsidy



School Year	Total Transportation Subsidy		
	Rural	Urban	State
2013-14	$231.5 M	$351.9 M	$583.4 M
2014-15	$234.3 M	$358.0 M	$592.3 M
2015-16	$235.7 M	$366.0 M	$601.7 M
2016-17	$236.1 M	$367.6 M	$603.7 M
2017-18	$244.4 M	$370.0 M	$614.4 M
Change	**5.6%**	**5.2%**	**5.3%**
5-Year Average	**$236.4 M**	**$362.7 M**	**$599.1 M**

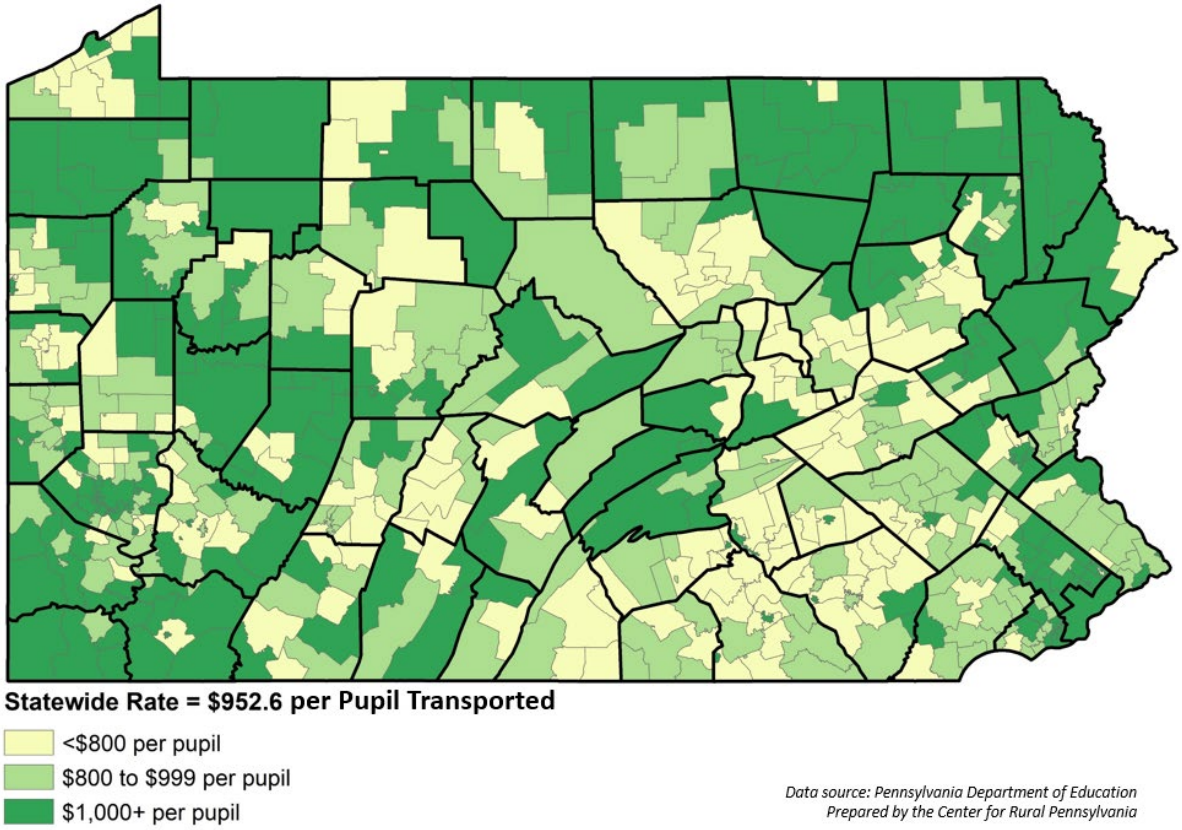
Source: Pennsylvania Department of Education, 2013-14 to 2017-18

Cost per Pupil Transported

From 2013-14 to 2017-18, the statewide, rural, and urban average costs per pupil transported were about $953, $984, and $941, respectively. The results from the statistical analysis[10] suggest that there is a statistically significant difference in the cost per pupil transported between rural and urban school districts. Figure 3 illustrates the average cost per pupil transported in Pennsylvania between 2013-14 and 2017-18.

[10] See Appendix C, Part 1 for details about the statistical analysis performed.

Figure 3. 5-Year Average Cost per Pupil Transported (2013-14 to 2017-18)



Although rural school districts need to transport fewer students than urban school districts, rural student populations are much less concentrated and live farther from the schools in which they are enrolled. The average student population density in urban school districts was 15.6 times greater than that in rural school districts for the study period (as shown in Table 4). To evaluate the impact of geographic size on cost per student transported, 78 rural school districts were ranked as large (162.7≤ land square miles ≤961.8), 79 rural school districts were ranked as medium (92.2≤ land square miles ≤159.2), and 78 rural school districts were ranked as small (25.1≤ land square miles ≤90.9) in this study based on their geographic size[11]. Table 5 compares the average cost per student transported by geographic size within rural school districts between 2013-14 and 2017-18.

[11] School district land square miles based on 2010 Census, U.S. Census Bureau.

Table 4. Comparison of Average Number of Students per School District Square Mile

School Year	Average Students per School District Square Miles	
	Rural	Urban
2013-14	14.9	228.5
2014-15	14.7	227.4
2015-16	14.5	227.0
2016-17	14.4	227.1
2017-18	14.2	226.5
Change	**-4.4%**	**-0.9%**
5-Year Average	**14.6**	**227.3**

Source 1: 2010 Census, U.S. Census Bureau
Source 2: Pennsylvania Department of Education, 2013-14 to 2017-18

Table 5. Average Cost per Pupil Transported in Rural School Districts

School Year	Average Cost per Pupil Transported by Geographic Size		
	Large	Medium	Small
2013-14	$1,048.1	$920.4	$902.4
2014-15	$1,076.4	$937.5	$904.4
2015-16	$1,097.7	$968.8	$899.9
2016-17	$1,122.8	$992.0	$930.1
2017-18	$1,148.0	$1,038.3	$982.3
Change	**9.5%**	**12.8%**	**8.9%**
5-Year Average	**$1,098.6**	**$971.4**	**$923.8**

Source: Pennsylvania Department of Education, 2013-14 to 2017-18

The results from the statistical analysis[12] indicated that there is a significant difference in cost per pupil transported between large and medium rural school districts. The cost difference is also statistically significant between large and small rural school districts. However, the cost difference between medium and small rural school districts is not statistically significant.

[12] See Appendix C, Part 2 for details about the statistical analysis performed

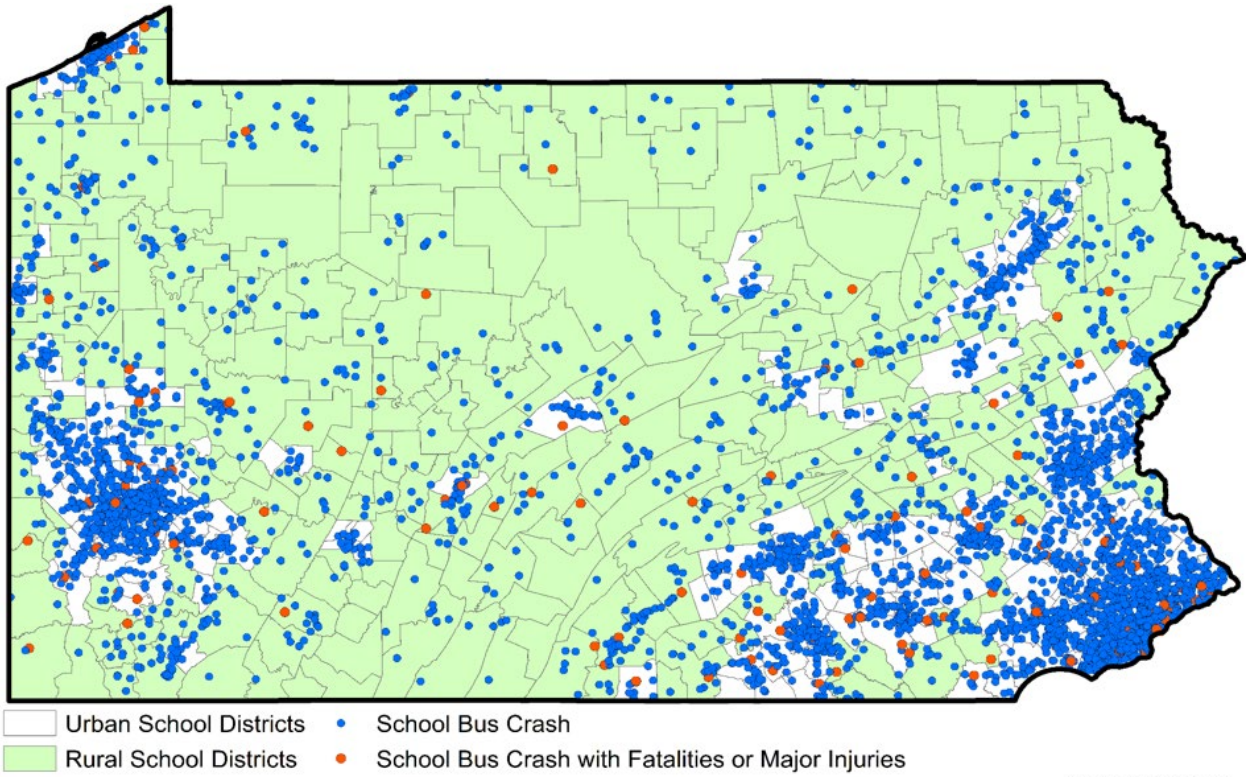
Each year, PDE assigns a recalculated market value aid ratio (MVAR) to each school district. Because the MVAR differentiates the relative wealth of a region where a school district resides, the calculation of a school district's transportation subsidy follows a different set of formulas if its assigned MVAR is less than 0.5. In the interests of coherence, this study adopted the MVAR approach to assess the impact associated with local wealth on cost per pupil transported. A school district's local wealth was defined as less affluent if its assigned MVAR equals or is greater than 0.5 or affluent if its assigned MVAR is less than 0.5. The results from the statistical analysis[13] imply that the difference in cost per pupil transported between less affluent and affluent areas is only statistically significant in 2013-14, and that the cost difference is not statistically significant from 2014-15 to 2017-18.

Assessment of Public School Transportation Safety

As transportation safety is a paramount concern for society at large, PennDOT publishes crash facts and statistics annually. Derived from these annual reports, Figure 4 illustrates the location of school bus crashes, Table 6 categorizes school bus crash fatalities, and Table 7 summarizes school bus crash injuries between 2013 and 2018. During this period, school bus crashes were concentrated in urban school districts but scattered among rural school districts.

[13] See Appendix C, Part 3 for details about the statistical analysis performed.

Figure 4. Location of School Bus Crashes 2013 - 2018



Data source: PennDOT
Prepared by the Center for Rural Pennsylvania

Table 6. School Bus Crash Fatalities by Category 2013 – 2018

School Bush Crash Fatalities (2013-2018)							
Year	School Bus Drivers	School Bus Passengers	School-Age Pedestrians	Other Pedestrians	Driver/ Passenger of Other Vehicle	Other/ Unknown	Total Fatalities
2013	0	0	0	3	2	0	5
2014	0	0	0	1	2	0	3
2015	0	0	1	0	5	0	6
2016	0	0	0	1	4	0	5
2017	1	0	0	0	3	0	4
2018	0	0	0	1	0	0	1

Source: Pennsylvania Department of Transportation, 2013-2018

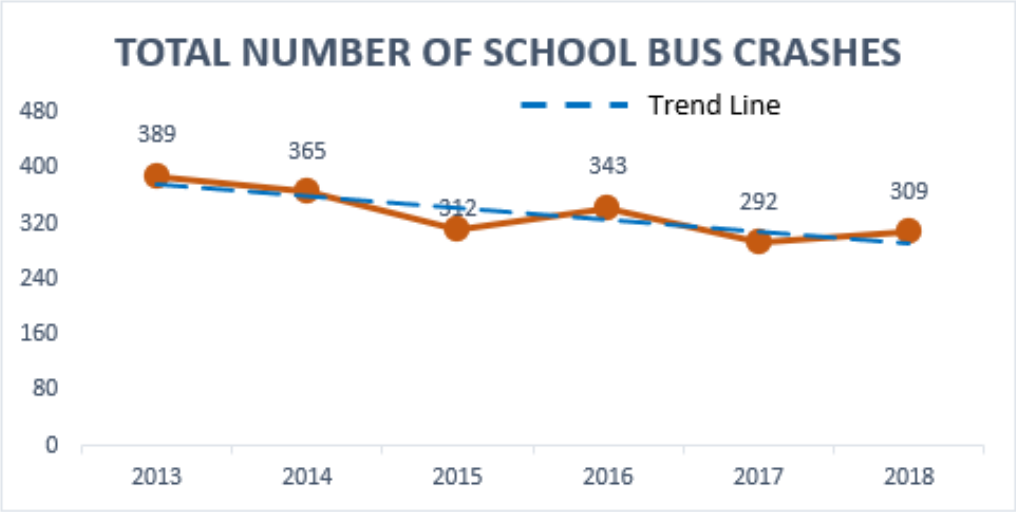
Table 7. School Bus Crash Injuries by Category 2013 – 2018

School Bus Crash Injuries (2013-2018)							
Year	School Bus Drivers	School Bus Passengers	School-Age Pedestrians	Other Pedestrians	Driver/ Passenger of Other Vehicle	Other/ Unknown	Total Injuries
2013	38	198	5	8	142	6	397
2014	36	266	3	5	170	5	485
2015	29	128	0	3	126	10	296
2016	44	204	8	5	156	32	449
2017	35	212	3	5	113	3	371
2018	34	168	2	5	115	9	333

Source: Pennsylvania Department of Transportation, 2013-2018

From 2013 to 2018, among all school bus crash induced fatalities, one was a school bus driver, and one was a school-age pedestrian. Total school bus crash fatalities peaked in 2015, and fell continuously in 2016, 2017, and 2018. Because the severity of each crash differs and many factors can contribute to a crash, the total number of school bus crash injuries and the total number of school bus crashes fluctuated between 2013 and 2018. However, as shown in Figure 5, the total number of school bus crashes exhibited an overall declining tendency in the study period.

Figure 5. Total Number of School Bus Crashes 2013 – 2018



Source: Pennsylvania Department of Transportation, 2013-2018

Analysis of Public School Transportation Service Providers

PDE defines three types of service provided for pupil transportation, namely LEA-owned service, contracted service, and fare-based service. Contracted service is further divided into contract with a contractor, contract with a parent or other individual, and contract with another LEA.

A school district may use all three types of transportation services and a contractor may provide transportation services to multiple school districts. When recording data in the eTran[14], personal preferences led to numerous variations in contractor names. For example, the service provider E and B Transportation has seven alternative names reported in the eTran. Table 8 reveals the number of distinct service providers in each category and is the result from examining and cleaning more than 14,600 records.

The number of fare-based service providers fluctuated during the study period. Contracted transportation services with a parent or other individual fell continuously between 2013-14 and 2016-17 but increased in 2017-18. Meanwhile, 38 more school districts, a 292.3 percent increase, contracted transportation services with another LEA. However, from 2013-14 to 2017-18, the number of school districts that provide LEA-owned transportation services decreased by 8.3 percent. Last but not least, the number of service providers in contracted service with a contractor declined continuously over the study period, which may lead to an increased market share for some large contractors. The results show in Table 8 indicate that more school districts were seeking independent contractors for all or some of their transportation services during the period of study.

[14] eTran is a data reporting system adopted by PDE.

Table 8. Number of School Transportation Service Providers by Category

School Year	Contracted Service			Fare Based Service	LEA Owned Service
	with Another LEA	with Contractor	with Parent or Other Individual		
2013-14	13	1134	709	20	156
2014-15	9	1088	643	24	148
2015-16	15	1065	591	26	147
2016-17	36	1027	584	26	144
2017-18	51	987	629	22	143
Change	**292.3%**	**-13.0%**	**-11.3%**	**10.0%**	**-8.3%**

Source: Pennsylvania Department of Education, 2013-14 to 2017-18

CONCLUSIONS

From 2013-14 to 2017-18, rural school districts underwent a reduction in both school enrollment and transportation ridership, 4.6 percent and 5.0 percent, respectively. Meanwhile, urban school districts experienced a 1.3 percent decrease in enrollment but a 1.4 percent increase in transportation ridership. Pennsylvania, overall, experienced a 2.19 percent decrease in school enrollment and a 0.39 percent decrease in transportation ridership. However, the enrollment decline was relatively gradual in urban school districts but more severe in rural school districts. From 2013-14 to 2017-18, Pennsylvania spent 10.3 percent more (in unadjusted dollars) on public school transportation. The increase was mainly driven by the transportation costs occurred in urban school districts. In rural school districts, the increase in transportation costs was less than 1.0 percent in 2014-15, 2015-16, and 2016-17, and increased 3.8 percent in 2017-18.

The continuous decline in enrollment and the steady rise in transportation cost, unsurprisingly, caused a statewide increase, 10.7 percent, in cost per student transported during the period of study. Transporting fewer students over large areas/longer distances left rural school districts with a higher cost-per-student transported. The combination of sharper enrollment declines, higher costs per student transported, and

inability to raise local revenues produces tremendous and unique challenges for rural school transportation.

Noticeable changes in the structure of school transportation service providers were identified between 2013-14 and 2017-18. First, contracted transportation service with another LEA increased by 292.3 percent. Secondly, the number of school districts that provide LEA-owned transportation services decreased by 8.3 percent. These statistics suggest that more school districts were seeking independent contractors for all or some of their transportation services during the study period. Third, contracted transportation service with a parent or other individual decreased by 11.3 percent. Last but not least, the continuous decline in the number of service providers in contracted service with contractor may lead to an increased market share for some big players.

Finally, the analyses of school transportation safety revealed that school bus crashes were concentrated in urban school districts but scattered among rural school districts. During the study period, among all school bus crash induced fatalities, one was a school bus driver, and one was a school-age pedestrian. The total number of school bus crashes fluctuated between 2013 and 2018, with an overall downward trend.

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APPENDIX A: Correlation Analysis of Enrollment and Ridership

State Level Correlation Analysis 1

The CORR Procedure

4 Variables:	TotalEnrolled totaltransportedcount totalnonpubliccount totalcscount

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
TotalEnrolled	5	1585102	13275	7925509	1570061	1605292	Total Enrolled
totaltransportedcount	5	1486986	2925	7434929	1483749	1491233	Total Transported
totalnonpubliccount	5	139480	5427	697398	132248	146816	Total Non-Public Transported
totalcscount	5	64380	3627	321901	59277	69014	Total Charter School Transported

Pearson Correlation Coefficients, N = 5
Prob > |r| under H0: Rho=0

	TotalEnrolled	totaltransportedcount	totalnonpubliccount	totalcscount
TotalEnrolled Total Enrolled	1.00000	0.90110 0.0368	0.98338 0.0026	-0.99174 0.0009
totaltransportedcount Total Transported	0.90110 0.0368	1.00000	0.83795 0.0764	-0.86759 0.0567
totalnonpubliccount Total Non-Public Transported	0.98338 0.0026	0.83795 0.0764	1.00000	-0.99179 0.0009
totalcscount Total Charter School Transported	-0.99174 0.0009	-0.86759 0.0567	-0.99179 0.0009	1.00000

Correlation Analysis of Enrollment and Ridership – Continued

Rural School Districts Correlation Analysis 2

The CORR Procedure

4 Variables:	TotalEnrolled	totaltransportedcount	totalnonpubliccount	totalcscount

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
TotalEnrolled	5	402482	7267	2012411	393528	412677	Total Enrolled
totaltransportedcount	5	407125	7923	2035627	396624	417417	Total Transported
totalnonpubliccount	5	19248	227.98070	96239	18899	19533	Total Non-Public Transported
totalcscount	5	2261	51.98846	11303	2212	2342	Total Charter School Transported

Pearson Correlation Coefficients, N = 5
Prob > |r| under H0: Rho=0

	TotalEnrolled	totaltransportedcount	totalnonpubliccount	totalcscount
TotalEnrolled Total Enrolled	1.00000	0.99565 0.0003	0.95247 0.0123	-0.63390 0.2508
totaltransportedcount Total Transported	0.99565 0.0003	1.00000	0.96247 0.0087	-0.70279 0.1856
totalnonpubliccount Total Non-Public Transported	0.95247 0.0123	0.96247 0.0087	1.00000	-0.71303 0.1764
totalcscount Total Charter School Transported	-0.63390 0.2508	-0.70279 0.1856	-0.71303 0.1764	1.00000

Correlation Analysis of Enrollment and Ridership – Continued

Urban School Districts Correlation Analysis 3

The CORR Procedure

4 Variables:	TotalEnrolled totaltransportedcount totalnonpubliccount totalcscount

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
TotalEnrolled	5	1182620	6121	5913098	1176533	1192615	Total Enrolled
totaltransportedcount	5	1079860	5612	5399302	1073816	1088815	Total Transported
totalnonpubliccount	5	120232	5205	601159	113349	127283	Total Non-Public Transported
totalcscount	5	62120	3593	310598	57021	66672	Total Charter School Transported

Pearson Correlation Coefficients, N = 5
Prob > |r| under H0: Rho=0

	TotalEnrolled	totaltransportedcount	totalnonpubliccount	totalcscount
TotalEnrolled Total Enrolled	1.00000	-0.85801 0.0628	0.95700 0.0106	-0.96845 0.0067
totaltransportedcount Total Transported	-0.85801 0.0628	1.00000	-0.95913 0.0099	0.94995 0.0133
totalnonpubliccount Total Non-Public Transported	0.95700 0.0106	-0.95913 0.0099	1.00000	-0.99144 0.0009
totalcscount Total Charter School Transported	-0.96845 0.0067	0.94995 0.0133	-0.99144 0.0009	1.00000

APPENDIX B: Number of Charter Schools by County

County	Status	2013-14	2014-15	2015-16	2016-17	2017-18
Adams	Rural	2	2	2	2	2
Allegheny	Urban	19	20	21	22	23
Armstrong	Rural	0	0	0	0	0
Beaver	Urban	4	4	3	3	3
Bedford	Rural	1	1	1	1	1
Berks	Urban	1	1	1	1	1
Blair	Rural	1	1	1	1	1
Bradford	Rural	0	0	0	0	0
Bucks	Urban	3	3	3	3	3
Butler	Rural	0	0	0	0	0
Cambria	Rural	0	0	0	0	0
Cameron	Rural	0	0	0	0	0
Carbon	Rural	0	0	0	0	0
Centre	Rural	4	4	4	4	4
Chester	Urban	9	9	9	8	8
Clarion	Rural	0	0	0	0	0
Clearfield	Rural	0	0	0	0	0
Clinton	Rural	1	1	1	1	1
Columbia	Rural	1	1	1	1	1
Crawford	Rural	0	0	0	0	0
Cumberland	Urban	0	0	0	0	0
Dauphin	Urban	5	5	5	6	6
Delaware	Urban	3	3	4	4	4
Elk	Rural	0	0	0	0	0
Erie	Urban	4	4	4	4	4
Fayette	Rural	0	0	0	0	0
Forest	Rural	0	0	0	0	0
Franklin	Rural	0	0	0	0	0
Fulton	Rural	0	0	0	0	0
Greene	Rural	0	0	0	0	0
Huntingdon	Rural	2	2	2	2	2
Indiana	Rural	0	0	0	0	0
Jefferson	Rural	0	0	0	0	0
Juniata	Rural	0	0	0	0	0
Lackawanna	Urban	2	2	2	2	2
Lancaster	Urban	1	1	1	1	1
Lawrence	Rural	0	0	0	0	0
Lebanon	Urban	0	0	0	0	0

Number of Charter Schools by County – Continued

County	Status	2013-14	2014-15	2015-16	2016-17	2017-18
Lehigh	Urban	6	8	9	9	8
Luzerne	Urban	1	1	1	1	1
Lycoming	Rural	0	0	0	0	0
McKean	Rural	0	0	0	0	0
Mercer	Rural	1	1	1	1	1
Mifflin	Rural	0	0	0	0	0
Monroe	Rural	2	1	1	1	1
Montgomery	Urban	2	2	2	2	3
Montour	Rural	0	0	0	0	0
Northampton	Urban	3	3	3	3	4
Northumberland	Rural	0	0	0	0	0
Perry	Rural	0	0	0	0	0
Philadelphia	Urban	90	89	86	89	87
Pike	Rural	0	0	0	0	0
Potter	Rural	0	0	0	0	0
Schuylkill	Rural	1	1	1	1	1
Snyder	Rural	0	0	0	0	0
Somerset	Rural	0	0	0	0	0
Sullivan	Rural	0	0	0	0	0
Susquehanna	Rural	0	0	0	0	0
Tioga	Rural	0	0	0	0	0
Union	Rural	0	0	0	0	0
Venango	Rural	0	0	0	0	0
Warren	Rural	1	1	1	1	1
Washington	Rural	0	0	0	0	0
Wayne	Rural	0	0	0	0	0
Westmoreland	Urban	1	1	1	1	1
Wyoming	Rural	0	0	0	0	0
York	Urban	5	4	4	4	4

APPENDIX C: Statistical Analysis of Cost per Pupil Transported

The normality test results suggest that the cost per pupil transported is not normally distributed, hence, the Wilcoxon-Mann-Whitney test was selected to perform the following statistical analyses.

Part 1. Statistical Analysis of cost per pupil transported by Status

Part 2 Statistical Analysis of Cost per Pupil Transported by Geographic Size

Part 3 Statistical Analysis of Cost per Pupil Transported by Local Wealth

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil Classified by Variable Status					
Status	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Rural	235	64946.0	58632.50	1603.14002	276.365957
Urban	263	59305.0	65618.50	1603.14002	225.494297

Wilcoxon Two-Sample Test	
Statistic	64946.0000
Normal Approximation	
Z	3.9379
One-Sided Pr > Z	<.0001
Two-Sided Pr > |Z|	<.0001
t Approximation	
One-Sided Pr > Z	<.0001
Two-Sided Pr > |Z|	<.0001
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	15.5095
DF	1
Pr > Chi-Square	<.0001

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil Classified by Variable Status					
Status	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Rural	235	63799.0	58632.50	1603.14002	271.485106
Urban	263	60452.0	65618.50	1603.14002	229.855513

Wilcoxon Two-Sample Test	
Statistic	63799.0000
Normal Approximation	
Z	3.2224
One-Sided Pr > Z	0.0006
Two-Sided Pr > |Z|	0.0013
t Approximation	
One-Sided Pr > Z	0.0007
Two-Sided Pr > |Z|	0.0014
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	10.3860
DF	1
Pr > Chi-Square	0.0013

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil Classified by Variable Status					
Status	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Rural	235	63696.0	58750.0	1607.79352	271.046809
Urban	264	61054.0	66000.0	1607.79352	231.265152

Wilcoxon Two-Sample Test	
Statistic	63696.0000
Normal Approximation	
Z	3.0760
One-Sided Pr > Z	0.0010
Two-Sided Pr > |Z|	0.0021
t Approximation	
One-Sided Pr > Z	0.0011
Two-Sided Pr > |Z|	0.0022
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	9.4634
DF	1
Pr > Chi-Square	0.0021

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil Classified by Variable Status					
Status	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Rural	235	63683.0	58750.0	1607.79352	270.991489
Urban	264	61067.0	66000.0	1607.79352	231.314394

Wilcoxon Two-Sample Test	
Statistic	63683.0000
Normal Approximation	
Z	3.0679
One-Sided Pr > Z	0.0011
Two-Sided Pr > |Z|	0.0022
t Approximation	
One-Sided Pr > Z	0.0011
Two-Sided Pr > |Z|	0.0023
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	9.4137
DF	1
Pr > Chi-Square	0.0022

School Year 2017-18 The

NPAR1WAY Procedure

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil Classified by Variable Status					
Status	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Rural	235	65018.0	58750.0	1607.79352	276.672340
Urban	264	59732.0	66000.0	1607.79352	226.257576

Wilcoxon Two-Sample Test	
Statistic	65018.0000
Normal Approximation	
Z	3.8982
One-Sided Pr > Z	<.0001
Two-Sided Pr > |Z|	<.0001
t Approximation	
One-Sided Pr > Z	<.0001
Two-Sided Pr > |Z|	0.0001
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	15.1984
DF	1
Pr > Chi-Square	<.0001

School Year 2013-14 to 2017-18

The NPAR1WAY Procedure

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil Classified by Variable Status					
Status	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Rural	1175	1600709.0	1465225.0	17940.4875	1362.30553
Urban	1318	1508062.0	1643546.0	17940.4875	1144.20486

Wilcoxon Two-Sample Test	
Statistic	1600709.0000
Normal Approximation	
Z	7.5518
One-Sided Pr > Z	<.0001
Two-Sided Pr > |Z|	<.0001
t Approximation	
One-Sided Pr > Z	<.0001
Two-Sided Pr > |Z|	<.0001
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	57.0305
DF	1
Pr > Chi-Square	<.0001

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	5457.0	6241.0	284.838551	69.075949
Large	78	6946.0	6162.0	284.838551	89.051282

Wilcoxon Two-Sample Test	
Statistic	6946.0000
Normal Approximation	
Z	2.7507
One-Sided Pr > Z	0.0030
Two-Sided Pr > |Z|	0.0059
t Approximation	
One-Sided Pr > Z	0.0033
Two-Sided Pr > |Z|	0.0067
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	7.5759
DF	1
Pr > Chi-Square	0.0059

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Small	78	5142.0	6123.0	282.132947	65.923077
Large	78	7104.0	6123.0	282.132947	91.076923

Wilcoxon Two-Sample Test	
Statistic	5142.0000
Normal Approximation	
Z	-3.4753
One-Sided Pr < Z	0.0003
Two-Sided Pr > |Z|	0.0005
t Approximation	
One-Sided Pr < Z	0.0003
Two-Sided Pr > |Z|	0.0007
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	12.0901
DF	1
Pr > Chi-Square	0.0005

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	6451.0	6241.0	284.838551	81.658228
Small	78	5952.0	6162.0	284.838551	76.307692

Wilcoxon Two-Sample Test	
Statistic	5952.0000
Normal Approximation	
Z	-0.7355
One-Sided Pr < Z	0.2310
Two-Sided Pr > |Z|	0.4620
t Approximation	
One-Sided Pr < Z	0.2316
Two-Sided Pr > |Z|	0.4631
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	0.5436
DF	1
Pr > Chi-Square	0.4610

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	5427.0	6241.0	284.838551	68.696203
Large	78	6976.0	6162.0	284.838551	89.435897

Wilcoxon Two-Sample Test	
Statistic	6976.0000
Normal Approximation	
Z	2.8560
One-Sided Pr > Z	0.0021
Two-Sided Pr > |Z|	0.0043
t Approximation	
One-Sided Pr > Z	0.0024
Two-Sided Pr > |Z|	0.0049
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	8.1668
DF	1
Pr > Chi-Square	0.0043

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Small	78	4965.0	6123.0	282.132947	63.653846
Large	78	7281.0	6123.0	282.132947	93.346154

Wilcoxon Two-Sample Test	
Statistic	4965.0000
Normal Approximation	
Z	-4.1027
One-Sided Pr < Z	<.0001
Two-Sided Pr > |Z|	<.0001
t Approximation	
One-Sided Pr < Z	<.0001
Two-Sided Pr > |Z|	<.0001
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	16.8465
DF	1
Pr > Chi-Square	<.0001

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	6603.0	6241.0	284.838551	83.582278
Small	78	5800.0	6162.0	284.838551	74.358974

Wilcoxon Two-Sample Test	
Statistic	5800.0000
Normal Approximation	
Z	-1.2691
One-Sided Pr < Z	0.1022
Two-Sided Pr > |Z|	0.2044
t Approximation	
One-Sided Pr < Z	0.1031
Two-Sided Pr > |Z|	0.2063
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	1.6152
DF	1
Pr > Chi-Square	0.2038

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	5490.0	6241.0	284.838551	69.493671
Large	78	6913.0	6162.0	284.838551	88.628205

Wilcoxon Two-Sample Test	
Statistic	6913.0000
Normal Approximation	
Z	2.6348
One-Sided Pr > Z	0.0042
Two-Sided Pr > |Z|	0.0084
t Approximation	
One-Sided Pr > Z	0.0046
Two-Sided Pr > |Z|	0.0093
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	6.9516
DF	1
Pr > Chi-Square	0.0084

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Small	78	4895.0	6123.0	282.132947	62.756410
Large	78	7351.0	6123.0	282.132947	94.243590

Wilcoxon Two-Sample Test	
Statistic	4895.0000
Normal Approximation	
Z	-4.3508
One-Sided Pr < Z	<.0001
Two-Sided Pr > |Z|	<.0001
t Approximation	
One-Sided Pr < Z	<.0001
Two-Sided Pr > |Z|	<.0001
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	18.9448
DF	1
Pr > Chi-Square	<.0001

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	6751.0	6241.0	284.838551	85.455696
Small	78	5652.0	6162.0	284.838551	72.461538

Wilcoxon Two-Sample Test	
Statistic	5652.0000
Normal Approximation	
Z	-1.7887
One-Sided Pr < Z	0.0368
Two-Sided Pr > |Z|	0.0737
t Approximation	
One-Sided Pr < Z	0.0378
Two-Sided Pr > |Z|	0.0756
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	3.2058
DF	1
Pr > Chi-Square	0.0734

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	5407.0	6241.0	284.838551	68.443038
Large	78	6996.0	6162.0	284.838551	89.692308

Wilcoxon Two-Sample Test	
Statistic	6996.0000
Normal Approximation	
Z	2.9262
One-Sided Pr > Z	0.0017
Two-Sided Pr > |Z|	0.0034
t Approximation	
One-Sided Pr > Z	0.0020
Two-Sided Pr > |Z|	0.0039
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	8.5730
DF	1
Pr > Chi-Square	0.0034

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Small	78	4944.0	6123.0	282.132947	63.384615
Large	78	7302.0	6123.0	282.132947	93.615385

Wilcoxon Two-Sample Test	
Statistic	4944.0000
Normal Approximation	
Z	-4.1771
One-Sided Pr < Z	<.0001
Two-Sided Pr > |Z|	<.0001
t Approximation	
One-Sided Pr < Z	<.0001
Two-Sided Pr > |Z|	<.0001
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	17.4630
DF	1
Pr > Chi-Square	<.0001

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	6646.0	6241.0	284.838551	84.126582
Small	78	5757.0	6162.0	284.838551	73.807692

Wilcoxon Two-Sample Test	
Statistic	5757.0000
Normal Approximation	
Z	-1.4201
One-Sided Pr < Z	0.0778
Two-Sided Pr > |Z|	0.1556
t Approximation	
One-Sided Pr < Z	0.0788
Two-Sided Pr > |Z|	0.1576
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	2.0217
DF	1
Pr > Chi-Square	0.1551

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	5527.0	6241.0	284.838551	69.962025
Large	78	6876.0	6162.0	284.838551	88.153846

Wilcoxon Two-Sample Test	
Statistic	6876.0000
Normal Approximation	
Z	2.5049
One-Sided Pr > Z	0.0061
Two-Sided Pr > |Z|	0.0122
t Approximation	
One-Sided Pr > Z	0.0066
Two-Sided Pr > |Z|	0.0133
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	6.2835
DF	1
Pr > Chi-Square	0.0122

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Small	78	5045.0	6123.0	282.132947	64.679487
Large	78	7201.0	6123.0	282.132947	92.320513

Wilcoxon Two-Sample Test	
Statistic	5045.0000
Normal Approximation	
Z	-3.8191
One-Sided Pr < Z	<.0001
Two-Sided Pr > |Z|	0.0001
t Approximation	
One-Sided Pr < Z	<.0001
Two-Sided Pr > |Z|	0.0002
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	14.5992
DF	1
Pr > Chi-Square	0.0001

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Geographic_Size					
Geographic_Size	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Medium	79	6622.0	6241.0	284.838551	83.822785
Small	78	5781.0	6162.0	284.838551	74.115385

Wilcoxon Two-Sample Test	
Statistic	5781.0000
Normal Approximation	
Z	-1.3358
One-Sided Pr < Z	0.0908
Two-Sided Pr > |Z|	0.1816
t Approximation	
One-Sided Pr < Z	0.0918
Two-Sided Pr > |Z|	0.1835
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	1.7892
DF	1
Pr > Chi-Square	0.1810

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Local_Wealth					
Local_Wealth	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Low	330	85425.0	82335.0	1518.34779	258.863636
High	168	38826.0	41916.0	1518.34779	231.107143

Wilcoxon Two-Sample Test	
Statistic	38826.0000
Normal Approximation	
Z	-2.0348
One-Sided Pr < Z	0.0209
Two-Sided Pr > |Z|	0.0419
t Approximation	
One-Sided Pr < Z	0.0212
Two-Sided Pr > |Z|	0.0424
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	4.1417
DF	1
Pr > Chi-Square	0.0418

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Local_Wealth					
Local_Wealth	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Low	328	84317.0	81836.0	1522.72344	257.064024
High	170	39934.0	42415.0	1522.72344	234.905882

Wilcoxon Two-Sample Test	
Statistic	39934.0000
Normal Approximation	
Z	-1.6290
One-Sided Pr < Z	0.0517
Two-Sided Pr > |Z|	0.1033
t Approximation	
One-Sided Pr < Z	0.0520
Two-Sided Pr > |Z|	0.1039
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	2.6547
DF	1
Pr > Chi-Square	0.1032

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Local_Wealth					
Local_Wealth	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Low	332	84187.0	83000.0	1519.92324	253.575301
High	167	40563.0	41750.0	1519.92324	242.892216

Wilcoxon Two-Sample Test	
Statistic	40563.0000
Normal Approximation	
Z	-0.7806
One-Sided Pr < Z	0.2175
Two-Sided Pr > |Z|	0.4350
t Approximation	
One-Sided Pr < Z	0.2177
Two-Sided Pr > |Z|	0.4354
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	0.6099
DF	1
Pr > Chi-Square	0.4348

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Local_Wealth					
Local_Wealth	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Low	330	83470.0	82500.0	1524.38512	252.939394
High	169	41280.0	42250.0	1524.38512	244.260355

Wilcoxon Two-Sample Test	
Statistic	41280.0000
Normal Approximation	
Z	-0.6360
One-Sided Pr < Z	0.2624
Two-Sided Pr > |Z|	0.5248
t Approximation	
One-Sided Pr < Z	0.2625
Two-Sided Pr > |Z|	0.5251
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	0.4049
DF	1
Pr > Chi-Square	0.5246

Wilcoxon Scores (Rank Sums) for Variable Cost_per_Pupil_Transported Classified by Variable Local_Wealth					
Local_Wealth	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Low	330	82512.0	82500.0	1524.38512	250.036364
High	169	42238.0	42250.0	1524.38512	249.928994

Wilcoxon Two-Sample Test	
Statistic	42238.0000
Normal Approximation	
Z	-0.0075
One-Sided Pr < Z	0.4970
Two-Sided Pr > |Z|	0.9940
t Approximation	
One-Sided Pr < Z	0.4970
Two-Sided Pr > |Z|	0.9940
Z includes a continuity correction of 0.5.	

Kruskal-Wallis Test	
Chi-Square	0.0001
DF	1
Pr > Chi-Square	0.9937

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