5-2019

# Report of Findings on the Student Transportation Cost Component of the EPS Funding Model

James E. Sloan
*University of Southern Maine*

Amy Johnson
*University of Southern Maine*

Report of Findings on the

# Student Transportation Cost Component

of the EPS Funding Model

Report for the Maine Department of Education

*Prepared by:*

James Sloan

Amy Johnson

Maine Education Policy Research Institute

University of Southern Maine

May 2019

**EPS Funding Model Review:**

# Report of Findings on the Student Transportation Cost Component

**James Sloan**
*James.Sloan@maine.edu*

**Amy Johnson**
*amyj@maine.edu*

## Introduction

### *Background*

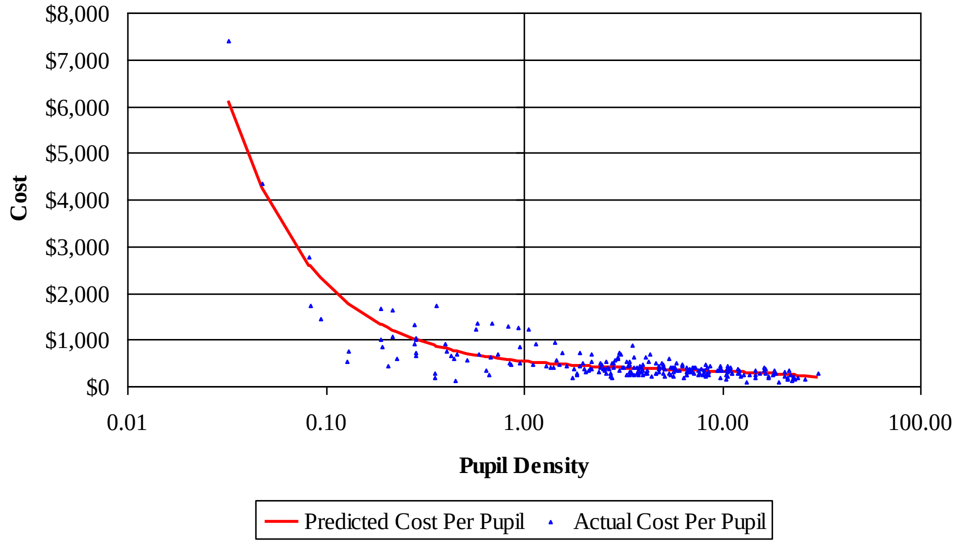
Prior to 2005-06, Maine used an expenditure-reimbursement model for funding transportation costs. School administrative units annually submitted their transportation expenditure to the State, and the school administrative units (SAUs) were reimbursed for a portion of these expenditures based on an ability-to-pay formula. Beginning 2005-06, Maine implemented Essential Programs and Services (EPS), a cost-based school funding model based on two fundamental premises. First, there must be *adequate* resources in each Maine SAU and school to achieve desired outcomes. In transportation, desired outcomes include safety, reasonable ride times by age group, meeting all student transportations needs including special needs, and others. Second, there must be *equity* in the distribution of these adequate resources among Maine SAUs. Equity means similar school administrative units should be treated similarly in the school funding formula, and dissimilar school administrative units should be treated dissimilarly.

An analysis of historical data revealed wide variations in reported transportation expenditures, even among Maine school administrative units with apparently similar cost-relevant characteristics, such as similar numbers of pupils, similar numbers of miles of road, similar numbers of miles traveled by school buses, etc. It was hypothesized that the differences in reported expenditures may be due to a combination of *discretionary* and *non-discretionary* cost drivers; that is, cost factors within the control of school administrative units and cost factors beyond their control. Discretionary factors and their associated expenditures reflect local decisions, and consequently, in theory, the cost of these factors may be considered the responsibility of the local SAU. However, non-discretionary factors are the joint responsibility of the State and SAUs, and thus should be accounted for in the EPS funding formula. A variety of potential non-discretionary cost drivers were examined at the time the transportation cost model was developed, but only *pupil density*, that is, the number of pupils per mile of road, was found to be highly correlated with 2000-2001 and 2001-02 expenditures. Students in sparsely populated rural SAUs, after all, generally live farther from school than pupils in densely populated urban SAUs and hence cost much more per pupil to transport.

Figure 1 displays visually the relationship that was found between actual and predicted costs. Each dot represents the transportation expenditures and pupil density of an individual SAU. Sparsely populated SAUs are on the left side of the graph and densely populated SAUs are on the right. The curve running through the middle of the dots represents a predicted cost for SAUs of any given density, which was determined using a statistical method known as regression analysis. The curve reflects the much higher costs of the sparsely populated SAUs and the lower costs of the densely populated ones.

Although density by itself was a very good predictor of transportation expenditures overall, expenditures in several specific areas were examined, including transportation to CTE schools and transportation to special education programs within and outside the SAU. Expenditures in each of these areas were relatively small in comparison to total transportation expenditures, but also not necessarily proportional to total expenditure. It was thought that expenditures in those areas could be better predicted and explained by carving them out and modeling them separately. In the resulting analysis, distance between high schools and CTE schools was found to be significantly correlated to the cost of CTE transportation. Also, mileage traveled to out-of-district programs was found to be significantly correlated to the cost of special need transportation, but mileage in-district was not. Adjustments were proposed for these areas.

**Figure 1: 2000-2001 Actual and Predicted Tranportation Operating Costs**




Other potential cost factors were also examined. Information about natural and man-made physical barriers that might affect transportation costs was collected from SAUs and analyzed. The potential barriers included unpaved roads; dead ends, turnarounds, or cul-de-sacs; mountains or hills; lakes or ponds; rivers; peninsulas or ocean shoreline, and islands. Each of these factors, as well as the total number of these factors, when provisionally added to the model based on density failed to improve the prediction. However, responses concerning three unique types of transportation costs were notable. These were homeless students, ferry costs, and island SAUs. Additional adjustments were proposed for these specific areas.

### *Adoption and Modification of the EPS Student Transportation Component*

In response to these studies, beginning in 2005-06, SAU transportation cost allocations in the EPS formula were determined based on pupil density, that is, the number of resident pupils divided by the miles of road within SAU, and adjustments for out-of-district special education transportation, CTE transportation, transportation of homeless pupils, ferry costs, and island SAU costs. In hopes of improving the EPS transportation component further, additional studies were conducted during the implementation phase of EPS.

A number of cost models, including several fixed rate models, were examined as potential alternatives to the density model. Although no models were found to be as predictive as the density model, one good model was seen as a potential complement to it. The model, which was referred to as the *odometer model*, predicted costs on the basis of miles traveled by SAU school buses per student conveyed. Although the prediction of expenditures was not quite as strong as the density model, it was seen as reflecting some non-discretionary cost factors that were not reflected in the density model. However, because it also was seen as being influenced by discretionary factors, it was not used as is. Instead, the *50/50 model* was calculated, which is the average of the density and odometer models. The EPS predicted cost allocation was modified to be equal to either the density model or the 50/50 model for each SAU, whichever was greater. Furthermore, the allocation was limited to no less than 90% of actual SAU expenditure in the most recent year and no more than 105%.

A further analysis of transportation system features that were thought to be potential cost drivers did not lead to any modification in the EPS cost model and in effect confirmed the current model. The features studied were the percent of miles retraveled returning down dead-end roads, percent of miles retraveled returning from edge of district, percent of miles retraveled going to another town, percent of regular run miles on midday buses, percent of regular run miles on late buses, percent of regular run miles on summer school buses, total hourly bus driver compensation, gasoline price per gallon, and diesel price per gallon. None of the features was found to be significantly correlated to the difference between the EPS cost allocation and actual expenditures with the exception of driver hourly compensation; even that correlation was low. The EPS model was not further modified.

***What costs are included in the EPS Student Transportation component?***

The same expenditures that are in the financial category for student transportation are included in the EPS Student Transportation component. Student transportation is an overhead expenditure (program code 0000) in the student transportation function (function code 2700). It covers transportation from home to school and back and from school to school. It includes regular transportation and special needs transportation. It includes transportation to regular schools, to CTE schools, and to special education programs.

***What costs are <u>not</u> included in the EPS Student Transportation component?***

Some transportation related costs are not included in the EPS Student Transportation component and may be included in other components of EPS or funded outside of EPS. Bus purchases are funded through the Maine Department of Education bus purchase program, which is outside of EPS. Costs associated with maintenance vehicles are included in the EPS Operation and Maintenance of Facilities component. Transportation of instructional employees for professional development is included in the EPS Professional Development component. Extra- and co-curricular transportation costs are funded through the EPS Extra- and Co-Curricular component. Field trips and CTE worksite transportation may not be directly in the EPS model components. However, as most EPS funding is not targeted to specific expenses, SAUs may apply state EPS subsidy funds to these expenditures.

## Methodology (4 steps)

The EPS Transportation model update is calculated in four steps:

Step 1: Adjustments: CTE, Special Education (out of district), Homeless Students, Ferry Costs, and Island SAUs
Step 2: Density Model
Step 3: Odometer Miles Model, and 50/50 model
Step 4: Model Floor and Ceiling

### *Step 1. Adjustments*

Although the variables most closely correlated with student transportation expenditures are the number of pupils and the miles of road, five aspects of student transportation were seen as not being related to these factors. They are transportation of students from high schools to CTE schools, transportation to out of district special education programs, transportation of homeless students to the schools they attended before becoming homeless, ferry costs, and transportation in island SAUs. These are modeled separately, in five separate adjustments.

*CTE Transportation.* The distance between high schools and CTE facilities varies across the state, as does the number of round trips per day. The CTE transportation allocation for each SAU is determined according to the number of miles traveled each day to each CTE facility and the number of days of operation of that facility at a per-mile rate equal to the statewide gross transportation operating expenditure per mile traveled by Maine SAU school buses.

*Out of District Special Education.* Some students need to be transported to out of district special education programs. SAUs report the total annual miles traveled and total expenditure on transportation to such programs. A statewide average expenditure per mile on transportation to out of district special education programs is calculated for use in the SAU allocations. The transportation allocation for each SAU the total number of annual miles traveled for that SAU at a rate equal to the statewide average expenditure per mile on transportation to out of district special education programs.

*Transportation of Homeless Students.* Some homeless students are living in locations outside the district and need to be transported to the school they were attending before they became homeless. The allocation for homeless students is equal to the net transportation expenditure on homeless students in the most recent year.

*Ferry Costs.* SAUs with students residing on islands have to transport students to the mainland using ferries if there is not an island school for the relevant grade. This is typically high school students. The Maine State Ferry service does not charge fares to students. Therefore, SAUs using the Maine State Ferry Service are not included in the EPS ferry cost adjustment. Casco Bay Lines does charge students fares. Portland is the only SAU that reports using Casco Bay Lines. The amount of the adjustment is the total actual fares paid in the most recent year.

*Island SAUs*. Transportation costs of island SAUs are not similar to mainland SAUs and would not be accurately reflected by the density model used for mainland SAUs. The transportation allocation for island SAUs is the total net transportation expenditure for the most recent year. These costs are monitored by the Maine Department of Education.

### *Step 2. Density Model*

Once the amount of the adjustments is known, this amount is subtracted from the total net transportation expenditure. The remaining adjusted net expenditure is the amount to be modeled using density. A reason for using density is that, while expenditures are the result of a mix of discretionary and non-discretionary factors, density is a totally non-discretionary factor. To generate the density model, a statistical method called multiple regression is used to predict the adjusted net expenditures of each SAU based only on its density, by finding a line of best fit between the predictor variable (density) and the variable to be predicted (adjusted net transportation expenditure).

The density used is a *linear pupil density*. It equals the number of resident pupils in the SAU divided by the total miles of road in the district. At the time of the original implementation of the EPS model, linear density was found to be more closely correlated to per-pupil transportation expenditure than area density, that is, pupils per square mile. Another way of looking at density is called sparsity, which is the reciprocal of density. In other words, sparsity is the number of miles of road per pupil. Sparsity is considered a transformation of density, and density and sparsity are considered two forms of the same basic variable. In running the model, both density and sparsity are included.

The result of the regression is three coefficients: (1) a constant per pupil dollar amount, (2) a dollar amount per pupil for each unit of pupil sparsity, and (3) a dollar amount per pupil for each unit of pupil density. These dollar amounts are added together to get the full predicted dollar amount per pupil. Mathematically speaking, the *Predicted Net Cost Per Pupil = Constant + Coefficient #1* x *sparsity + Coefficient #2* x *density*, using the density and sparsity of each SAU and the statewide constant and coefficients provided by the results of the regression analysis. The resulting predicted cost per pupil is multiplied by the number of resident students to get the total density model predicted cost.

### *Step 3. Odometer Miles Model and 50/50 Model*

The odometer miles model is generated by a similar method to the density model, except it uses slightly different variables. Instead of using density and sparsity as predictors in the regression analysis, the sole predictor is the total number of annual miles driven by the SAUs buses divided by the number of pupils conveyed. Because the predictor variable relies on the total number of miles driven, not just miles taking students from home to school and back, the variable to be predicted is the *gross*, not net, annual transportation expenditure.

The result of the regression is two coefficients: (1) a constant per-pupil dollar amount and (2) a per-pupil dollar amount for each mile travelled per pupil conveyed. Mathematically, *Predicted Gross Expenditure Per Pupil Conveyed = Constant + Coefficient* x *miles travelled per pupil conveyed*, using the miles travelled and number of pupils conveyed for each SAU and the statewide constant and coefficient provided by the results of the regression analysis.

Because the allocation needed for the EPS transportation component is the adjusted net cost rather than gross expenditure, one more step has to be taken. The predicted gross expenditure per pupil conveyed is multiplied by a factor equal to the SAU's adjusted net expenditure per resident pupil divided by its gross expenditure per pupil conveyed. The resulting predicted net cost per pupil is multiplied by the number of resident students to get the total odometer model predicted cost.

*50/50 Model.* The miles driven by an SAU's buses may be partly non-discretionary and partly discretionary. For this reason, it was decided that the odometer model should not be used by itself in determining SAU transportation allocations. Instead, a 50/50 model is calculated equal to the simple average of the density model and the odometer miles model. (A simple average is the same as a 50/50 weighted average.) The predicted cost for each SAU at this stage, before application of the floor and ceiling, is equal to its density model predicted cost or 50/50 model predicted cost, whichever is greater.

### *Step 4. Floor and Ceiling*

Once the combined density and 50/50 model predicted cost is calculated, there is one more step to determine the cost allocation, which provides one more layer of protection against the possible presence of non-discretionary factors that are not accounted for in the model. The predicted cost for each SAU is compared to its actual net transportation expenditure in the most recent year. If the predicted cost is between 90% and 105% of actual, the SAU cost allocation is equal to the predicted cost. If it is below 90% of actual or above 105% of actual, the SAU cost allocation is equal to 90% or 105% of actual, respectively. In years between periodic model updates, the most recent year of available expenditure data may be used for recalculating the 90% floor and 105% ceiling.

### *Inflation*

Note that the model is calculated using the most recent year of data. An inflation factor has not been applied. When computing allocations in future years, an appropriate up-to-date inflation factor should be applied at that time. In the past, the Maine Department of Education has applied the Consumer Price Index for All Urban Consumers (CPI-U), which is a well-known and widely used inflation factor.

## Data

The study was conducted using Fiscal Year 2015-16 data provided by the Maine Department of Education. Much of the data used in calculating the adjustments was from the EFM43 report. This includes: (1) the daily route miles traveled and number of days of operation used in the CTE transportation adjustment, (2) the annual miles traveled and expenditure used in the out of district special education transportation adjustment, and (3) the net expenditure used in the homeless student adjustment. Ferry fares paid by Portland were provided by email. Net transportation expenditures used in the density model, the Island SAU adjustment, and the floor and ceiling limits were provided in a spreadsheet: "Transportation Expenditures 2015-16 for 2017-18 Funding." Geographic data on miles of road used in the density model were downloaded from the Maine Office of GIS (MeGIS) website and aggregated by MEPRI staff. Resident enrollments used in the density model were taken from the Enrollment Reports for October 1, 2015, Resident Counts by SAU. Odometer miles traveled by buses, gross transportation expenditures, and number of students conveyed, used in the odometer miles model as well as in calculating the per mile rate for CTE transportation, were from the ED546 report.

The following items were noted about the data:

- Seventeen SAUs listed zero expenditure for Fiscal Year 2015-16.
- Around 27 SAUs lacked EFM43 detail data, including Portland and Cape Elizabeth. Without EFM43 data, it was not possible to compute adjustments for CTE, out-of-district special education, and homeless student transportation for these SAUs.
- RSU 39 appear to have annual total miles to CTE facilities rather than daily in its EFM43 data. The listed figures were divided by 175 days to get a daily mileage figure.
- Around 22 SAUs showed NULL data for students conveyed and miles traveled in their ED546 data. In addition, several may have had problematic numbers for students conveyed, including RSU 63 (4 pupils conveyed, 836 resident students), Wells-Ogunquit CSD (35 students conveyed, 1,286 resident pupils), and Baring Plantation (1 pupil conveyed, 26 resident pupils). The SAUs with NULL or problematic data were excluded from the odometer miles model and the 50/50 model.
- New Sweden showed a negative net transportation expenditure.

## Results

### *Step 1. Adjustments Summary*

The total statewide allocation amounts for the five EPS transportation cost adjustments appear in Table 1. The $11.5 million in adjustments represents 10.2% of total net expenditures of $113.5 million for student transportation. While some of the amounts are small compared to the statewide total, they may be important for the individual SAUs receiving the adjustments.

Table 1. EPS Transportation Cost Adjustments

| Adjustment | SAUs | Amount |
|---|---|---|
| CTE | 97 | $3,851,502 |
| Special Education (out of district) | 97 | $6,445,047 |
| Homeless Students | 58 | $865,162 |
| Ferry Costs | 1 | $61,324 |
| Island SAUs | 7 | $308,181 |
| Total | | $11,531,215 |

Total adjustments before inflation equal 10.2% of total transportation expenditures of $113,585,511.

### *Step 2. Density Model Summary*

After subtracting the $11.5 million of adjustment allocations from the net transportation expenditure of $113.5, the adjusted net expenditure of $102.0 million was modeled using pupil densities. Table 2 shows that the mean per-pupil adjusted net expenditure was $958, and also that there was a very wide variation in per pupil amounts. The standard deviation, which is a measure of how far above or below the mean individual SAUs tend to be on average, was $1,422, which was greater than the mean. The coefficient of variation, that is, the standard deviation divided by the mean, was 1.48. A coefficient of variation above 1.00 represents a very wide variation. Such a wide variation illustrates why a cost model is needed and why a flat per pupil amount, which may be appropriate for some EPS cost model components, would be inadequate for student transportation.

Table 2. Density Model Descriptive Statistics

| Variable | Mean | Std. Deviation | Coefficient of Variation |
|---|---|---|---|
| Adjusted Net Expenditure Per Pupil | $958.29 | $1,421.51 | 1.48 |
| Density | 6.59 | 5.79 | 0.88 |
| Sparsity | 0.49 | 1.10 | 2.26 |

The results of the density model regression analysis are shown in Table 3 and Table 4. Table 3 shows R and R-squared, which are measures of how well the density model fits the individual SAU expenditure data. A perfectly fitting model, where the predicted cost is exactly equal to the actual expenditures for each SAU, would have and R and an R2 of 1.000. The R of .729 and $R^2$ of .531 for the density model represents a good fitting model where most of the variation in per-pupil costs is explained by the SAUs having different densities.

Table 3. Density Model Fit

| R | $R^2$ |
|---|---|
| .729[a] | .531 |

The coefficients generated by the regression analysis that are used to determine the SAU predicted transportation costs under the density model are shown in Table 4. The constant of $616 is a base per-pupil amount for each SAU. For every unit of density, $15 is subtracted from that amount, and for every unity of sparsity $913 is added. The t values and statistical significance (Sig.) are measures of the importance of each variable within the overall model. Higher t values and lower significance values denote more importance within the model. The sparsity coefficient is by far the most important parameter in the model (t = 14.428). Significance values of 0.050 or below are considered statistically significant. The density coefficient is therefore not statistically significant. Sometimes researchers will remove statistically insignificant variables form a model. In this case, however, keeping the density coefficient improves the fit of the model for highly dense SAUs. For other SAUs it makes little difference. For this reason, density was retained.

Table 4. Density Model Coefficients[a]

| Variable | Coefficient | t | Sig. |
|---|---|---|---|
| (Constant) | $616.20 | 5.386 | 0.000 |
| Density | -$15.37 | -1.282 | 0.201 |
| Sparsity | $913.42 | 14.428 | 0.000 |

a. Dependent Variable: Adjusted Net Expenditure Per Pupil

***Step 3. Odometer Miles Model and 50/50 Model Summary***

Similarly to the variables in the density model analysis, the variables in the odometer model analysis also exhibit wide variation, as shown in Table 5. The mean gross operating expenditure of $1,200 per pupil conveyed is lower than the standard deviation of $1,489, which yields another very high coefficient of variation. The number of miles traveled per pupil conveyed also exhibits a very high coefficient of variation, similar to pupil sparsity in Table 2 of the density analysis.

Table 5. Odometer Model Descriptive Statistics

| Variable | Mean | Std. Deviation | Coefficient of Variation |
|---|---|---|---|
| Gross Operating Expenditure Per Pupil | $1,199.81 | $1,488.82 | 1.24 |
| Miles Travelled Per Pupil Conveyed | 456.05 | 926.23 | 2.03 |

The model fit statistics R and $R^2$ are shown in Table 6. The R of .888 and $R^2$ of .788 for the odometer model denote a very good fitting model where most of the variation in gross expenditure per-pupil conveyed is explained by differences in the number of miles traveled per pupil conveyed. Unlike previous reviews, where the density model had a better fit overall than the odometer model, with this year of data the odometer model had the better fit, R = 0.888 vs. R = .729.

Table 6. Odometer Model Fit

| R | $R^2$ |
|---|---|
| .888[a] | .788 |

The coefficients generated by the regression analysis that are used to determine the SAU predicted transportation costs under the odometer model are shown in Table 7. The constant of $549 is a base per-pupil amount for each SAU. For every mile traveled per pupil conveyed, $1.43 is added to that amount. The coefficient for miles traveled per pupil conveyed is very important in predicting the cost (t = 27.289; Sig. < 0.001).

Table 7. Odometer Model Coefficients[a]

| Variable | Coefficient | t | Sig. |
|---|---|---|---|
| (Constant) | $548.97 | 10.188 | 0.000 |
| Miles Travelled Per Pupil Conveyed | $1.43 | 27.289 | 0.000 |

a. Dependent Variable: Gross Operating Expenditure Per Pupil

### *Step 4. Floor and Ceiling Summary*

After the density, odometer, and 50/50 models were calculated and the greater of the density and 50/50 models were identified for each SAU, the 90% floor and 105% ceiling were applied. It was then possible to determine which SAUs had an allocation at the floor, ceiling, density model, and 50/50 model. The results of this analysis are shown in Table 8. Thirteen percent of SAUs had a cost allocation equal to the density model (4%) or 50/50 model (9%). Another 78% had their allocation based on a percentage of actual expenditures: 13% of SAUs at 90% of actual and 65% of SAUs at 105% of actual. And in these cases, the density and 50/50 models determined whether the allocation percentage was 90% or 105% of actual expenditure. Accordingly, the transportation component has some resemblance to an expenditure-based model for many SAUs, but the density and 50/50 models have an effect on the allocation either way.

Table 8. SAUs Funded at Floor, Ceiling, Density, and 50/50 Models

| | SAUs | Percent | Allocation | Percent |
|---|---|---|---|---|
| Zero Expenditure | 17 | 7% | $0 | 0% |
| Island SAU | 7 | 3% | $308,181 | 0.3% |
| 90% of Actual | 31 | 13% | $18,920,905 | 17% |
| 105% of Actual | 160 | 65% | $71,797,498 | 63% |
| Density Model | 11 | 4% | $2,855,038 | 2% |
| 50/50 Model | 22 | 9% | $20,469,066 | 18% |
| Total | 248 | 100% | $114,350,066 | 100% |

Total transportation allocation before inflation equals 100.7% of actual expenditures of $113,585,511.

*Alternative models.* Two possible alternatives to the prediction model currently used in EPS were examined. The current model is the greater of the density and 50/50 models. One alternative was to use the greater of the density model and the pure odometer model, that is, use the odometer model in place of the 50/50 average of the density and odometer models. The second alternative examined was to use only the density model.

A comparison of these alternatives is shown in Table 9. Overall, the prediction model currently used in EPS, the greater of the density and 50/50 model, was the closest fit to overall statewide transportation expenditures. Using the greater of the density or pure odometer model would result in a greater statewide total allocation and a greater number of SAUs funded at the 105% ceiling. Using only the density model would result in a lower statewide total allocation, more SAUs funded at the 90% floor, fewer at the 105% ceiling, and only a slight increase in the number of SAUs. Thus, the current model may be considered a better fit than either of the alternatives considered.

Table 9. SAUs Funded at Floor, Ceiling, and Models for Three Model Alternatives

| | Density or 50/50 | | Density or Odometer | | Density only | |
|---|---|---|---|---|---|---|
| | SAUs | Percent | SAUs | Percent | SAUs | Percent |
| Zero Expenditure | 17 | 7% | 17 | 7% | 17 | 7% |
| Island SAU | 7 | 3% | 7 | 3% | 7 | 3% |
| 90% of Actual | 31 | 13% | 24 | 10% | 53 | 21% |
| 105% of Actual | 160 | 65% | 178 | 72% | 134 | 54% |
| Density Model | 11 | 4% | 10 | 4% | 37 | 15% |
| 50/50 or Odometer | 22 | 9% | 12 | 5% | 0 | 0% |
| Total | 248 | 100% | 248 | 100% | 248 | 100% |
| Allocation | $114,350,688 | | $115,860,081 | | $111,313,968 | |
| % of Actual | 100.7% | | 102.0% | | 98.0% | |

## Conclusion and Recommendations

The EPS transportation component accurately and adequately reflects student transportation costs. The five adjustments account for 10% of the total transportation allocation, and provide individualized amounts for each SAU in their respective specific transportation areas. The density and 50/50 models are each accurate and reasonable models on their own, and taking the more favorable one for each SAU may be supplying additional resources for possible unique non-discretionary factors that are not otherwise accounted for in each model. That said, the greater of density and 50/50 is higher than actual for most SAUs. The result is 65% of SAU allocations at the ceiling, 13% at the floor and only 13% at the calculated model. The transportation component may be coming closer to an expenditure driven model—plus or minus 5% or 10%. In an expenditure driven model, (a) SAUs that can afford to spend more may be rewarded with a greater state subsidy allocation based on additional discretionary expenditures and (b) SAUs spending less may not be able to take full advantage of any economies they have implemented due to reductions in their cost allocation and state subsidy.

### *Recommendations*

Based on an examination of the results of the study, we make the following recommendations:

1. The updated EPS transportation model should be used in determining SAU transportation allocations.
2. Periodic updates and reviews of the transportation component every three years should continue on schedule.
3. The Maine Department of Education should continue to monitor and improve the accuracy of data reported by SAUs, especially data included in the ED546 and EFM43 reports.
4. The Maine Department of Education may consider collecting additional data on field trip transportation and CTE worksite transportation similar to the data collected for transportation to out of district special education programs and CTE programs. For field trip transportation, the data might include items such as the number of field trips, number of students transported, total annual miles traveled by buses on field trips, and the cost of field trip transportation. If appropriate, either or both may be added as additional adjustments to the model.
5. The floor, ceiling and prediction models should continue to be monitored in future periodic reviews to determine if the trend toward becoming more driven by expenditures continues.
6. *Further research.* During a future periodic review or as an additional study brief, the Department of Education may consider an examination of the implications of modifying the base model, floor, and ceiling with the intention of making allocations less dependent on individual SAU expenditures. For example, an alternative to be studied could be to remove the pure density model and use the 50/50 model for every SAU while raising the ceiling to 110%.