January 11, 2022

To: Ruth Hardy, Senator
Emily Kornheiser, Representative

From: Tammy Kolbe, University of Vermont
Bruce Baker, The Rutgers University
Drew Atchison & Jesse Levin, American Institutes for Research

Cc: Catherine Benham, Vermont Legislative Joint Fiscal Office

RE: Request for additional information for use in calculating categorical aid

This memorandum responds to your request to develop per pupil cost estimates for the additional cost of educating economically disadvantaged students, English Language Learners (ELL), middle and high school students, and operating small schools and those located in sparsely populated areas. You also requested further information and clarification regarding the additional cost of educating ELL students in Vermont.

It is our understanding that the information requested will inform the Task Force's thinking regarding a policy alternative that envisions using categorical grants, in lieu of the existing equalized pupil calculation, to adjust for differences in educational costs among Vermont's districts and schools. Our response to your request and questions is framed with this objective in mind.

Our response is structured in two parts. First, we present the results of our analyses, and second, we respond to your questions about funding for ELL students, point-by-point.

Per Pupil Cost Estimates

We were asked to consider how the findings from our school-level cost models might be implemented by allocating cost adjustments as categorical grants, while maintaining the integrity and goals of the initial model estimates.

Making these changes required that we first re-estimate our weights for use in an additive formula, and then convert those weights to per pupil cost estimates that could be allocated as categorical grants. In doing so, the goal was to identify appropriately representative dollar values that emulate our per pupil cost predications (i.e., costs of attaining common outcomes) for each district statewide, at an equitable tax rate.

Analytic Approach

The first step in our analysis was to determine the relevant dollar cost equivalent for the base value corresponding to each cost factor (i.e., dollar value of an index value equal to 1.0). In a pupil weighting model, the base value (1.0) equals the cost to achieve state average outcomes for the child with no additional needs, in a school with minimum cost structure (e.g., a school with >250 students; located in a district with >100 persons per square mile; and serving only elementary grades).

Because we built our models on the cost of ensuring all Vermont schools have sufficient resources to ensure that each student attains the statewide average for student outcomes in mathematics and English language arts (ELA), we can assume that the average district-level spending in any given year, on the average mix of student characteristics in a typical Vermont educational setting, operating at average efficiency represents the average expenditure needed to achieve average outcomes. That is, existing average spending is equivalent to the costs of achieving existing average levels of outcomes in math and ELA in the state (at average efficiency).

That said, existing average spending per pupil is just that - the average overall spending, not base per pupil cost. To determine the dollar value of the base per pupil cost, we took the sum of relevant spending (excluding federal revenue and state categorical revenue – e.g., transportation and special education) for FY2018 and divided that number by the total number of weighted pupils, as generated by our updated cost-based weights. The resulting number is the base cost for FY2018, associated with achieving state average outcomes in AY2018.

Going forward, the FY2018 base must be further inflated to account for (a) increases in labor costs over time (i.e., labor costs are the primary driver of inflation in education costs), and (b) increased expectations on the part of the state for better student outcomes. That is, if the state wants to improve student outcomes from present levels, on average, the cost per pupil to achieve those outcomes will be higher and the base must be recalibrated accordingly.

The per pupil costs were derived by multiplying the updated weights taken from our school level model[1] and assume a base cost per pupil of $9,219 for FY2018 (exclusive of state revenues for special education and transportation, and all forms of federal aid).[2] We converted the weights to dollar amounts that could be allocated as categorical grants (on a per need pupil basis) by multiplying the weight by the estimated base cost amount. The estimates were generated using findings from our school-level cost models. As we note in our earlier report, the school-level models yield the most rational and robust estimates and as such were the primary basis for our policy recommendations.

[1] Please see our October 28, 2021 memo for updated weights and description of assumptions and methods for updating the school-level weights from what was presented in our initial report. (Link to memo: https://ljfo.vermont.gov/assets/Uploads/6cd716da7e/memo-response-final-10_29_21.pdf).

[2] Table 1 presents the *average* cost per pupil for each cost factor derived from our school-level models, at a base cost per pupil of $9,216 for FY2018 (excluding state special education, state transportation, and all federal categorial aid). The base cost represents the cost to the state (exclusive of other forms of federal and state categorical aid) of achieving average outcomes for an elementary student, with no additional needs, in a school of sufficient size and population density (as defined, above). The base cost was calculated by dividing the total relevant statewide spending ($1.406 billion) by the total weighted ADM (152,582). Put another way, the average (relevant) spending per pupil in FY2018 was $16,086 ($1.406 billion/87,412 students). This is the average cost per pupil of achieving average outcomes, at average efficiency, in an average cost setting, in that year. The average per-pupil cost in the state, however, is about 75% above the minimum, or base cost (i.e., dividing the average per-pupil cost by the base per-pupil cost shows that the average cost is about 74% higher (i.e., $16,086 / $9,216 = 1.745)).

Estimated Costs

Table 1 provides our estimates for the *average* additional per pupil costs for each identified cost factor. Column 2 presents the dollar estimates for FY2018 (i.e., the cost of AY2018 outcomes). To maintain alignment with costs (of AY2018 common outcomes), over time the categorical grants will require adjustment for both inflationary costs (e.g., cost of labor) and any changes to the outcome expectations placed on districts. The former can be accomplished with a labor cost inflation index, but the latter may require estimating updated cost models. Column 3 presents the cost estimates inflated (at a 2% annual rate) for FY2023.[3]

For comparison purposes, Column 4 represents the cost estimates generated by Vermont's JFO for the purposes of modeling the "Cost Equity" policy proposal in the Task Force on Pupil Weighting's final report.[4] It is worth noting that the differences between our estimates inflated to represent FY2023 dollars and those calculated by JFO are between 1 and 2%.

As a reminder, the dollar values presented in Table 1 represent the *average* additional per pupil cost for each cost factor and are *explicitly tied to a base per pupil spending amount for FY2018*. In other words, the dollar values represent the average additional spending necessary to attain average levels of achievement (statewide) for AY2018. The average cost implies that some districts likely needed to spend more, and others less, than that estimated amount to attain average outcomes for that year. Similarly, as noted above, additional spending may be required for districts and schools to improve educational outcomes over-and-above average levels of proficiency (statewide) for AY2018.

Design Considerations

In our 2018 report, we provided cost-based weights that were designed to work within Vermont's existing funding formula. Specifically, the cost-based weights are calibrated to give every Vermont town the opportunity to raise and spend the amount needed to achieve common outcome goals, with equitable tax rates. That is, if every Vermont town put up the same tax rate (at the statewide average), their local revenue plus state aid (based on the weights derived from our cost models) would generate sufficient funding for all school districts to attain the statewide average level of proficiency in math and ELA.

However, in considering these weights it is necessary to recognize that Vermont's school funding policy, including the role played by pupil weights in that formula, is fundamentally different from the typical cost-adjusted foundation state aid formulae that specify the adequate funding levels to be raised and spent by each district (most often calculated with cost adjustments in the form of weighted pupils). Such formulae mandate the level of minimum local contribution required such that in combination with state aid, all districts would spend at least their "adequate" target level of funding.

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[3] For illustrative purposes we show the categorical allotments inflated at 2% annually to FY2023 values. However, an alternative calculation would be to inflate the base amount and then multiply the weights (Column 1) by the inflated base.

[4] Estimates presented in Column 4 are the same as those presented in Table 4: Example Cost Equity Payment Amounts, *Final Report: Task Force on the Implementation of the Pupil Weighting Factors Report* (Link: https://ljfo.vermont.gov/assets/Uploads/e11b031427/Final-Report-Weighting-Study-Task-Force-12_17_21.pdf).

In part, this approach is common because state courts in places like Kansas and New Jersey (and others) have declared that their constitutions require that the legislature provide students equal opportunity to achieve specific, adequate, outcome goals.[5] That is, the student right to attend schools that have resources capable of meeting outcome goals is paramount and takes precedence over taxpayer rights to decide otherwise. Local taxpayers may not simply choose, as tax preference, to deprive the children in their community of their state constitutional right to equitable and adequately funded schools.

By contrast, the Vermont school finance formula is designed to let towns make decisions about the education tax rates they wish to impose, given the educational programs and services they wish to provide and the aid they expect to receive from the state and federal government. However, if the Vermont legislature adopted a local required minimum school tax rate (at a high enough rate) in combination with cost-based weights, the Vermont formula would produce much the same result as the foundation formulae in place elsewhere. All districts implementing the required tax rate would spend what is estimated to be needed to achieve current (prior year's) average outcome levels, while still preserving the ability of towns to raise and spend more according to local preferences.

The alternative "Cost Equity" proposal articulated in the Task Force's final report proposes to use categorical grants to adjust for differences in educational costs across Vermont districts. In doing so, the proposal departs from the assumptions and design parameters that currently underlie the state's existing school funding policy. Instead, this approach would effectively shift the state's policy to a "reverse foundation formula," where instead of applying weights or fixed grant amounts to a stable (and ideally, empirically derived) cost-based foundation amount, categorical grants will be used to offset some portion of local per pupil spending, as decided by towns.

Specifically, under this proposal, while all districts will receive the same dollar amount per pupil as cost adjustments, unlike a typical foundation formula, the effective weight (proportionally) of the per pupil grant amount will vary by district, according to differences in the base per pupil spending amount that result from differences in both the level of need and spending preferences among Vermont towns.

To be clear, categorical grants are a viable policy tool for adjusting for differences in costs among school districts. However, appending multiple categorical grant programs to Vermont's existing school funding approach, which relies on local decision making and a self-equalizing approach to raising revenues, may introduce new complexities and other unintended consequences.

One potential argument in favor of using categorical grants – as opposed to the state's existing equalized pupil calculation – to adjust for differences in school district spending is the notion that targeted and specific grant dollars are more likely to "stick" where they land (i.e., the "flypaper effect").[6] That is, if the state provides lump sum grants to districts for each category of need, the funds are more likely to be spent toward those purposes. In doing so, this benefit would serve to

[5] For summaries of reforms in Kansas and New Jersey, please see: (1) Baker, B.D., Kearns, C., Atchison, D., & Levin, J. (2020). State finance reform vignette: Kansas (https://carsey.unh.edu/sites/default/files/media/2020/06/20-11882_5._primer_statevignettes_kansas_air_formatted_v5.pdf); and (2) Baker, B.D., Kearns, C., Atchison, D., & Levin, J. (2020). State finance reform vignette: New Jersey (https://carsey.unh.edu/sites/default/files/media/2020/06/2011882_5._primer_statevignettes_new_jersey_air_formatted_v3.pdf).

[6] For example, see Inman, R.P. (2008). *The flypaper effect.* (No. W14579). National Bureau of Economic Research.

counterbalance an existing challenge with Vermont's existing school funding system – reliance on local preferences for education spending and taxation. However, there are two substantial caveats to this claim:

(1) Without other changes to statute and regulation, there is no way to ensure that districts in fact spend dollars for intended purposes. In and of itself, simply categorizing funding does nothing to reshape the existing assumptions and policy parameters that currently allow for substantial local control over educational programs and practices and local tax rates.[7]

    Additionally, there is evidence that categorizing funding in this way can introduce new inefficiencies into the system. For example, these concerns are substantiated by past research on California's experiences, when the state relied heavily on a categorical grant-based funding system. Research shows that the use of categorical grants in this way, and to this extent, lead to substantial reductions in the efficiency with which funds were spent (with respect to producing outcomes) (Duncombe & Yinger, 2011).[8] More recently, California moved to a weighted foundation aid formula, more like that of New Jersey or Kansas, with those reforms already producing positive outcomes (Johnson & Tanner, 2018).[9]

(2) Grant amounts based on our calculations will provide either too little or too much aid for most Vermont school districts. The grant amounts represent an *average additional per pupil cost* for a particular cost factor, and as such are imperfect adjustments for differences in educational costs among Vermont school districts, which are outside a district's control.

    The extent of difference between the average per pupil spending amount will depend on exactly how much more or little a district needs to spend to attain common outcomes for all students – but, will be particularly problematic for districts at either end of the cost distribution. Districts that have higher average costs for a particular factor will not have these costs fully adjusted by the grant, and as a result will face a choice of less-than-optimal spending to meet student needs *or* increasing the local tax burden to pay for the difference in costs not met or paid for by the categorical grant. Conversely, districts that have lower-than-average costs for a particular factor will receive more dollars than necessary for optimal spending. They will face a different choice, either to (a) spend at higher levels than necessary (i.e., introducing or perpetuating inefficiencies) or (b) use the excess funding to reduce tax burden.

    In many ways, these tradeoffs are what we currently see with the existing weights (which are not empirically derived – i.e., cost-based). Districts that are "underweighted" face decisions to spend less than optimally or increase the local tax burden to make up the difference in unadjusted costs, whereas districts that are "overweighted" have tax capacity to spend more (inefficiently so) at lower tax rates. The primary difference, however, is that adjustments with

[7] To some extent, this same concern applies to Vermont's existing approach to equalizing costs using pupil weights. The primary difference is that adjustments made with categorical grants are indifferent to local spending decisions, whereas the weights are designed to proportionately adjust for locally determined differences in costs.
[8] Duncombe, W., Yinger, J. Making do: state constraints and local responses in California's education finance system. *Int Tax Public Finance* 18**,** 337–368 (2011). https://doi.org/10.1007/s10797-010-9159-3.
[9] Johnson, R. C., Tanner, S. (2018). *Money and freedom: The impact of California's school finance reform* (research brief). Palo Alto, CA: Learning Policy Institute.

categorical grants are indifferent to local spending decisions and need, whereas the weights are designed to proportionately adjust for locally determined differences in costs.

Accordingly, there is reason to believe that a shift to a categorical grant program will not substantively narrow existing gaps in spending, and educational opportunities (and by extension outcomes) among Vermont school districts. Using average costs in this way may also introduce new risks to cost containment, particularly in places where the grant amount exceeds what is necessary to provide an adequate education to a particular student need group or a given location.

Taken together, while we feel that the cost estimates provided in Table 1 are an accurate reflection of the *average* additional cost of educating economically disadvantaged, ELL and middle and secondary level students, as well as operating small schools and those in sparsely populated areas to common standards/outcomes, it is important to recognize the limitations with using these estimates to develop multiple categorical aid programs that would be appended to Vermont's existing school funding policy framework.

Supplemental Funding for ELL Students

In this section, we respond to specific questions posed by JFO and Senator Hardy (November 19 and 21, 2021, respectively) about the ELL cost equivalence.[10]

1. **If the task force created a separate categorical aid program for ELL, what is the right amount of aid to provide?**

   For FY2018, the *average* additional cost of educating an ELL student to common outcomes was $22,947. However, as noted above, this number represents the *average* cost to Vermont schools. It may be the case that this amount is either less or more than what Vermont districts need to spend to reach common outcomes for ELL students. As a result, we cannot say for certain that this amount is the "right amount" of per pupil aid for all districts. Rather, if the goal is to develop a categorical grant program that provides a per pupil grant amount that reflects the average cost to schools of educating an ELL student, then our estimate can be best understood as the typical additional cost of educating an ELL student to common outcomes for FY2018.

2. **What are your recommendations for how a per pupil categorical aid for ELL might be adjusted for economies of scale and marginal costs? For instance, would a sliding scale be appropriate? And, if so, what does your team recommend as cut points?**

   We share your interest and concern with developing a funding program that supports Vermont's ELL students who attend schools in a variety of contexts. As implied by your questions, the dispersion and concentrations of ELL students among Vermont districts/schools presents challenges for developing a fair and efficient categorical aid

[10] Please note, in some instances the questions posed were not transcribed verbatim here, and instead we have paraphrased the question for the purposes of our response. This was done for brevity and our goal is to represent the questions' sentiment as intended by the authors. We are happy to provide the transcript of the questions posed, upon request.

program for ELL programs. On the one hand, there are districts that serve larger numbers of ELL students and as a result operate at a very different scale from districts that serve a handful of students. It is also the case that there is a considerable degree of heterogeneity in ELL populations between and within school districts. Accordingly, we agree that it is likely that Vermont's districts and schools may face dissimilar per pupil costs for educating ELL students to common standards due to variations in economies of scale that come with differences in ELL enrollment and need.

That said, given the limited number of districts and schools in Vermont with substantial numbers of ELL students, we were unable to develop reliable cost models for per pupil costs for different levels of ELL enrollment (at the district or school level). As a result, based on our existing cost models we cannot recommend specific cost adjustments for different levels of ELL enrollment using the cost models (e.g., a sliding scale). An alternative costing out strategy, however, might provide this information. For instance, the Task Force might convene a professional judgment panel (PJP)[11] that identifies packages of resources that are required to operate effective ELL programs, at different levels of scale, and cost these resources out using the ingredients method (also known as resource cost modeling). We noted that the Task Force already referenced a resource-based costing out approach in its deliberations (e.g., establishing a staffing ratio that could be used to calculate fixed program costs).

Given the heterogeneity in need among Vermont districts, it also may be worth considering a hybrid policy approach that allows districts to opt into different approaches for cost adjustments (e.g., weights or categorical grant). For instance, while weights may be appropriate for districts/schools operating programs at scale, such a policy approach may not be the best fit for places with relatively small numbers of ELL students that have high fixed costs of providing appropriate services and supports (and who may be ineligible for other types of federal funding).

3. **Other states provide ELL funding amounts at levels lower than the cost estimate generated by the Weighting Study report. Why might the amounts in other states be different from what was estimated for Vermont?**

We agree that there is considerable variability among states in both the weights and supplemental grant amounts used to adjust for differences in the cost of educating ELL students. In their review of more than 70 empirical cost studies that included ELL students and corresponding state policies, Jimenez-Castellanos & Topper (2012) identified several limitations with existing school funding research and policymaking that likely contribute to this variability.[12] Specifically:

[11] For an example of how a PJP might be applied, please see: Chambers, J., Levin, J., & DeLancey, D. (2007). Efficiency and Adequacy in California School Finance: A Professional Judgment Approach. *Getting Down to Facts.* (Link: https://cepa.stanford.edu/content/efficiency-and-adequacy-california-school-finance-professional-judgment-approach).
[12] Jimenez-Castellanos, O. & Topper, A.M. (2012) *The cost of providing an adequate education to English language* learners: A review of the literature. *Review of Educational Research, 82*(2), 179-232. (Link: https://journals.sagepub.com/doi/abs/10.3102/0034654312449872).

(1) ELL adjustments contained in most contemporary state school funding policies are not cost based, and instead reflect legacy policy or were politically derived. Accordingly, it is essentially an apples-to-oranges comparison between what is contained in other states' school funding policies and the estimates derived from our cost-based models.

(2) There is substantial variability in the treatment in ELLs in cost studies, particularly with respect to how ELL students are classified and treated in cost estimation. In fact, some school funding studies do not explicitly consider the additional cost of educating ELL students. That said, all methods agree that current funding levels in most states are insufficient to meet specified performance standards.

Additionally, it is worth noting that some state funding formulae lack adjustments for ELL students entirely. This does not imply that these costs do not exist, but rather that the legislatures in those states have not considered providing funding adjustments for ELL as a priority.

We view the weight derived from the cost models estimated for Vermont as a valid and reliable adjustment for the differences in the cost of educating Vermont's ELL students to common standards. Similarly, the per pupil cost estimate (i.e., $22,947 for FY2018) is a similarly valid and reliable estimate for the average additional cost, in dollars, of educating an ELL student.

4. The value for the revised ELL weight (October 28, 2021) is larger than estimates provided in the Weighting Study report. Why did this occur?

In our October 28, 2021 memorandum we noted that the re-estimated weight for the school-level model increased to 2.49. We believe this adjustment is likely due to the change in poverty measure. The prior weight was based on a weighting estimation that used the existing AOE poverty measure, which accounts for ELL students in its count of economically disadvantaged students. The revised measure used in the re-estimated weights – i.e., FRPL eligibility – no longer includes ELL students in the measure, and as a result a portion of the cost differential for ELL students that was initially captured by the AOE poverty measure is now entirely represented by the re-estimated ELL weight.

Table 1

Proposed Weights & Average Per-Pupil Costs for Identified Cost Factors

Cost Factor	Cost Adjustments Based on School-Level Cost Function Models			Vermont JFO Proposed Amount (Column 4)/d
	Proposed Weight (Column 1)/a	Average Per-Pupil Cost (in $'s Per-Pupil)		
		FY2018 (Column 2)/b	FY2023 (Column 3)/c	
Student Need				
Poverty (FRL)	1.03	$9,492	$10,480	$10,664
ELL	2.49	$22,947	$25,335	N/A
Grade Level				
Middle Grades (6-8)	0.36	$3,318	$3,663	$3,727
Secondary Grades (9-12)	0.39	$3,594	$3,968	$4,038
School Enrollment				
<100 Pupils	0.21	$1,935	$2,137	$2,174
100-250 Pupils	0.07	$645	$712	$725
Population Density (Persons per Square Mile)				
<36 per Square Mile	0.15	$1,382	$1,526	$1,553
36 - <55 per Square Mile	0.12	$1,106	$1,221	$1,242
55 - <100 per Square Mile	0.07	$645	$712	$725

/a Source: Table 1, Response Memo (October 28, 2021) (Link: https://ljfo.vermont.gov/assets/Uploads/6cd716da7e/memo-response-final-10_29_21.pdf).
/b Average per pupil costs in dollars as derived from school-level cost models reported in the Study of Pupil Weights in Vermont's Education Funding Formula (FY2018).
/c Per pupil costs in dollars for FY2023, based on FY2018 estimates escalated for inflation as a 2% annual rate.
/d Source: Table 2, Final Report: Task Force on the Implementation of the Pupil Weighting Factors Report (Link: https://ljfo.vermont.gov/assets/Uploads/e11b031427/Final-Report-Weighting-Study-Task-Force-12_17_21.pdf). It is unclear from the Task Force report whether these numbers are comparable to the FY2018 (Column 2) or FY2023 (Column 3) estimates derived from the school-level cost function models.