Analysis Plan

Study of Delaware School Funding

Drew Atchison, Jesse Levin, Nora Gannon-Slater

August 2022

AIR®

Advancing Evidence.
Improving Lives.

Analysis Plan

Study of Delaware School Funding

Drew Atchison, Jesse Levin, Nora Gannon-Slater

August 2022

AIR® Headquarters
1400 Crystal Drive, 10th Floor
Arlington, VA 22202-3289
+1.202.403.5000 | **AIR.ORG**

Contents

Introduction

In this analysis plan, we describe our multifaceted approach to evaluating state funding systems. In brief, our approach for this plan involves (a) understanding the local context, (b) conducting a state comparative analysis, (c) conducting analyses of administrative data to evaluate equity and adequacy of funding using a cost-function approach and compare spending in charter and traditional public schools, (d) performing primary data collection and analysis to evaluate funding adequacy using a professional judgment approach, (e) conducting interviews with district administrators and charter school operators to understand perceived strengths and weaknesses of the current approach to school funding, and (f) simulating alternative policy options. We describe each component of our proposed approach in more detail in what follows.

Understanding the Local Context

As part of any evaluation of a state's education funding system, we must first comprehensively review Delaware's current system of state funding. As part of this review, we will identify the major funding streams that account for education funding in Delaware and describe any relevant mechanisms or restrictions regarding how dollars within these funding streams are distributed or raised. This review will be inclusive of state, local, and federal funding including opportunity funding, mental health services funding, and local referenda requirements for traditional school districts and capital funding.

We will also reach out to local school funding experts and advocates to identify any important nuances of the state funding system that affect the collection and reporting of education funding data and the perceived strengths and weaknesses of the current school funding system.[1] We will solicit input from our project liaisons from the Delaware Department of Education when determining which organizations or individuals with whom we should speak.[2] One example of an organization that could provide valuable input is Education Equity

---

[1] We used a similar approach in our recent study of New Hampshire. We met with leadership from Reaching Higher New Hampshire and individuals from the New Hampshire School Funding Fairness project. These meetings took the form of informal conversations and were not formal interviews for the purpose of qualitative data collection.

[2] As of submission of this analysis plan, we have spoken to First State Educate and Rodel and have reached out to the Delaware Charter Schools Network, the Latin American Community Center, and the Wilmington Center for Education Equity and Policy.

Analysis Plan: Study of Delaware School Funding

Delaware.[3] In addition to providing valuable knowledge of the local context, this outreach will serve to build confidence in our evaluation from education advocates in the state. Although we will seek expertise from these organizations, we will ensure that our evaluation remains objective and impartial.

State Comparative Analysis

For the state comparative analysis, we will begin by performing a comprehensive scan of all state finance systems, with an emphasis on elements that are intended to address disparities in educational opportunities and outcomes. The scan will delineate clearly the types of funding adjustments used to address the four factors that drive the cost of providing educational services: student needs (those who are low-income, English learners, or with a disability), scale of operations and sparsity, grade range, and geographic differences in the price levels of inputs. In addition, the scan will provide a description of the funding mechanisms used by states, including (a) constant student funding weights for students within a given need category, (b) multiple weights for students in a similar need category (e.g., differential funding for students with different types and/or severity of disability), (c) resource-based allocations in which funding is based on the cost of supporting set ratios of (non)personnel resources to students in different need categories, and (d) cost reimbursement, in which at least a portion of what is spent on serving students in different need categories is reimbursed. Our review will be careful to point out the similarities in the finance system structure between Delaware and other states.

In addition to the high-level overview of all state finance systems, we will select a smaller set of comparison states that provide more meaningful points of comparison to Delaware and will perform more in-depth reviews of their approaches to school funding. Potential criteria for selecting peer comparison states include geographic proximity to Delaware (e.g., other states in the Mid-Atlantic) and the relevance of funding formula mechanisms for informing any future school funding reform efforts in Delaware (e.g., weighted student funding models).

In addition to comparing state funding policies and structures, we will also compare overall funding levels and student outcomes across a set of comparison states. A key component of any assessment of education funding is determining whether funding levels are sufficient to meet the educational goals of the state. To this end, we will conduct descriptive analyses of state

---

[3] Education Equity Delaware (https://www.educationequityde.org/) is a coalition made up of organizations represented on the state Education Funding Improvement Commission (EFIC), which was created through legislation to develop recommendations for adopting a student-centered funding system.

Analysis Plan: Study of Delaware School Funding

funding levels to examine how state funding levels and student outcomes have changed over time within Delaware and compared to comparison states.

Analyses of Administrative Data

Building the Fiscal Analysis Data Set

The proposed analyses of administrative data will rely on the study team's substantial expertise working with education finance data as well as data on student enrollments and outcomes. Because Delaware only has 19 school districts (three of which are countywide vocational districts), it will be important for this study to emphasize the analysis of school-level fiscal data in addition to analysis of district-level data. We submitted a formal request for data and documentation, as well as met with department staff knowledgeable about Delaware's fiscal data.[4] Based on our conversations with these individuals, we believe it will be possible to obtain detailed fiscal data with building-level attribution (i.e., where expenditures can be attributed to specific school sites or central offices) for the most recent 3 years of data (2019–20 through 2021–22). We will also obtain detailed fiscal data at the district level going back to 2014–15. The Delaware Department of Education also keeps detailed information on average staff salaries and full-time equivalent staff numbers across a variety of position types at the school level. We can use the school-level staffing data and detailed district-level fiscal data to develop estimates of school-level spending for the years prior to 2019–20. However, we will test their accuracy by comparing estimated spending to actual spending in the more recent years for which data from both sources are available (from 2019–20 to 2021-22).

In addition to fiscal data, we will gather data on student outcomes and enrollments by district and school. Most of these data are available on the Delaware Open Data Portal (https://data.delaware.gov). After we gather all necessary data elements, we will build a data set that incorporates fiscal data (inclusive of all state, local, and federal funding categories), student enrollment and demographics, district and school contextual factors (e.g., charter school status, vocational status, geographic location), and student outcomes (e.g., test scores, graduation rates, attendance rates, and suspension rates). The resulting data set will facilitate the analyses described subsequently.

---

[4] The data request was delivered in an e-mail from project director Drew Atchison to the client on July 15, 2022.

Student Need, Equity, and Adequacy Analyses: The Cost-Function Approach

We will conduct broad analyses to examine the equity and adequacy of education funding in Delaware. To do so, we will use a well-established process that (a) identifies the extent to which disparities in student outcomes exist that are associated with student need factors (needs analysis), (b) examines the existing degree of equity in the distribution of education funding and/or spending with respect to student needs and other cost factors (equity analysis), and (c) determines how much each district should be spending to efficiently achieve the state's educational goals while accounting for differences in student need (cost analysis).

Needs Analysis: Analysis of Disparities in Outcomes Associated With Student Needs

First, we will conduct an analysis that examines the relationships between various student needs and outcomes. This analysis will enable us to examine which student need variables are most strongly indicative of lower student outcomes and, therefore, should be accounted for in a state funding formula. To begin, we will generate an aggregate measure of performance for each school using a method known as confirmatory factor analysis, which identifies relationships between observed variables and one or more underlying latent constructs. In this context, the analysis will be used to generate an aggregate outcome factor score for each school based on student test scores (on math and English language arts), student absence rates, suspension rates, graduation rates, and dropout rates.

To examine the associations between student needs and outcomes, we will start with simple pairwise correlations between typical measures of student need (incidences of poverty, English learners [ELs], and special education) and student outcomes (the aggregate outcome factor and individual outcome measures). We will then estimate a regression model to estimate more precisely the relationships between typical measures of student need (poverty, EL status, and special education status) and outcomes, when controlling for other variables including measures of scale (school size), grade configuration, and geographic indicators (such as rurality/urbanicity). Because student needs variables are often related with each other and other contextual variables, this analysis will allow us to examine the unique contribution of individual need and context measures in explaining variation in student outcomes across schools. The results of this analysis will provide justification for inclusion of certain factors in the cost-function analysis that will be used to estimate the cost of providing an adequate educational opportunity and inform how the state funding formula might be improved (described further on).

Equity Analysis: Analysis Examining Disparities in Educational Opportunities

The analysis examining the equity of resource distribution across districts and schools will use regression models to isolate the relationship between resource levels (funding or spending) and different types of student need. For instance, we will use this approach to identify whether

districts or schools with higher incidences of student poverty receive more (or less) funding per pupil than those with lower incidences of student poverty, accounting for other student needs (i.e., special education and English learner rates), district/school size, rurality/urbanicity, and proportions of students by grade level. This analysis will provide results that show the degree to which there exist general disparities with respect to the way funding is allocated across districts and schools. Specifically, the findings will shed light on whether the current school finance mechanism allocates funding in a relatively progressive manner (districts with higher needs tend to receive more funding than those with lower needs) or regressive manner (districts with lower needs tend to receive more funding than those with higher needs). Should the results show significant funding disparities, we will further investigate the extent to which these can be explained by differences across districts in teacher experience levels.[5] As part of this analysis, our primary spending variable of interest will be total current expenditures. However, we can also examine how individual funding streams (e.g., state revenue or opportunity funding) are distributed with respect to various student needs.

We will compare equity of resource distribution in Delaware with other states, building from prior work by study team member Professor Bruce Baker (Baker et al., 2021). This work examined the progressiveness of school funding across districts with respect to poverty using national data to enable the comparison of equity in Delaware with other policy-relevant states. Like the equity analysis previously described, we will use regression analysis to examine the relationship between district funding levels and district poverty, controlling for other district factors that may affect spending levels (i.e., district size, rurality, other student needs) but perform the analysis across a selection of other states. Specifically, we can compare Delaware with other states that have proven track records of equitably distributing resources (e.g., New Jersey; see Baker et al., 2020), as well as states with less progressive resource distributions. In this way, we can benchmark Delaware against other states to better understand the extent of resource disparities in the state relative to its peers.

---

[5] As mentioned, a prominent feature of Delaware's current funding system is the calculation of unit counts based on raw (unweighted) student enrollment, which dictates the number of teachers that are funded. The fact that the mechanism funds teacher units regardless of the actual salary each teacher commands may lead to inequity should there be a systematic negative relationship between the incidence of more highly experienced (and highly paid) teachers and student needs or other factors that drive costs.

Analysis Plan: Study of Delaware School Funding

Cost-Function Modeling

The study team will then estimate cost-function models that will help identify how resources *should* be distributed to provide all students an equal opportunity to achieve a specified level of outcome.[6] We will estimate two cost-function models:

- A cost-function model using only data on Delaware schools

- A regional cost-function model estimated across several states in the Mid-Atlantic region, based on the National Education Cost Model developed by Bruce Baker (Baker et al., 2018, 2021)

The cost-function model using Delaware-specific data may allow us to use more refined measures of student outcomes and student needs, depending on data availability and quality. However, cost-function models generally perform better with a large number of data points (i.e., a limited number of data points can result in less precise estimates). Therefore, the limitation of the Delaware model is the relatively small number of districts and schools in the state. We can overcome this limitation somewhat by using school-level data and pooling data across several school years.

However, to supplement the Delaware-specific cost-function model, we will estimate a cost-function model pooling data across several states in the Mid-Atlantic region. This will allow us to increase the number of observations that we use in estimating the cost-function model, increasing the precision and stability of the parameter estimates.

Using these cost-function models, we will project the cost required for attaining a given level of outcomes accounting for the level of student needs and other cost factors for each district or school. We will then use the projected costs for each district or school as the dependent variable in a simpler estimated regression model that incorporates only the cost factors that would likely be used as weights in a funding formula as predictors. Using the simpler weights regression model, we will then estimate base per-pupil spending levels and funding weights for each student need and district or school characteristic included that can be used (a) to compare with the existing implicit funding weights calculated from the results of the equity analysis and (b) to make subsequent recommendations. Specifically, these values will represent the

---

[6] Specifically, the models will inform the development of a funding formula that exhibits desirable properties such as the following (Chambers & Levin, 2009):
- Fairness: It will promote and preserve strict vertical funding equity across districts so that differential funding is provided to districts to support students with different levels of need.
- Comprehensiveness: It will account for adjustments that are not taken into account sufficiently in the current funding system.
- Minimizes incentives: It will make use of factors that are beyond a district's control, thus minimizing any perverse incentives to pursue additional funding by exerting influence over the formula factors.

Analysis Plan: Study of Delaware School Funding

collection of funding parameters for a model that equitably allocates funding and will provide an adequate opportunity for all students to achieve the set outcome levels, accounting for differences in students' backgrounds and circumstances.

We will compare estimates from the Delaware-specific model and the Mid-Atlantic regional model derived from the National Education Cost Model. If parameters that are common to both models are estimated with the same directionality and magnitude, that will give us increased confidence in the validity of the results stemming from the Delaware-specific model. Furthermore, we will examine and compare the base per-pupil funding amount and funding adjustments for the different categories of student need estimated from the model with the analogous base per-pupil funding and adjustments implied by the state's existing funding system. The degree to which the estimated and existing funding adjustments deviate will be reported clearly to show the extent to which the current funding mechanism may need to be modified.

Charter School Comparative Analysis

Delaware's education system includes 24 charter schools serving more than 15,000 students, according to the Delaware Charter School Network. More than 10% of the state's public school students attend charter schools (Veney & Jacobs, 2021).

Charter schools have different organizational structures and may serve different types of students, on average, than traditional public schools. Therefore, a direct comparison of spending or revenue in charter schools and traditional public schools based on state-collected fiscal data is often not appropriate. More specifically, in our prior research, we have identified the following challenges when comparing spending between charter and traditional schools:

- Traditional school districts and charter schools may have service provision arrangements that are not reflected accurately in expenditure data. For example, Delaware charter schools may enter into agreements with traditional school districts for transportation services, school facilities, or other services. We want to make sure that we understand how these arrangements are being accounted for in both school district and charter school financials so that we generate the most accurate estimates of spending.

- Financial records for charter schools may not be comprehensive of all spending for the charter organization. Charter organizations consist of the school itself as well as a nonprofit or for-profit governing organization. For charter school organizations, some amount of spending may occur at the school level and some at the larger organization level. This is analogous to some spending in a school district occurring at the school level and some centrally at the district level. If charter school fiscal data consist only of the school-level

portion of spending, then state fiscal data may underreport spending on the charter organization.

- Charter schools often enroll a different population of students than traditional public schools. Charter school, for example, may disproportionately serve students from certain grade levels (e.g., high school grades) than traditional public schools. Charter schools may serve students with different average demographic characteristics. Because at least some portion of funding may be allocated on the basis of student needs and funding may be differentiated on the basis of grade levels served, any comparisons of spending or funding between charter schools and traditional public schools should account for differences in student population and other school characteristics that may drive funding differences.

To ensure that any comparisons of spending between charter schools and traditional schools are appropriate and accurate, we will take the following steps:

- Conduct interviews with charter school administrators and school district administrators to identify any service arrangements between charter schools and traditional school districts. If service arrangements do exist, we will investigate how these service arrangements are reflected in fiscal data. For example, if the traditional school district contributes to the transportation of students attending charter schools, then transportation spending may show up in the district fiscal data even though the expense is for charter school students. If that is the case, we will appropriately allocate transportation costs for students attending charter schools to the charter school and subtract those costs from the district's expenditures.

- Collect comprehensive fiscal data directly from each charter school operator.[7] As previously described, state-collected fiscal data may differ from data provided directly from the charter operators. Using both state-collected fiscal data and data from the charter operators, we will first compare the two sets of data to determine whether and to what extent differences in total reported spending and revenue exist. If substantial differences do exist, we will then determine which data source is most comprehensive of all organization spending and will use the data to make comparisons of spending between charter and traditional schools.

- Account for differences in student and school characteristics in comparisons of spending between charter and traditional public schools. To make spending comparisons conditional on student needs and school grade configuration, we will use regression analysis to

---

[7] We will start by collecting audited financial reporting from charter schools, which are supposed to be publicly posted to each charter school's website as legislated in Title 14 Chapter 5. If we are unable to find the audit reports, we will request these directly from the charter schools.

Analysis Plan: Study of Delaware School Funding

statistically control for various indicators of student need, including measures of poverty, EL status, and student disability status as well as proportions of students enrolled in various grade ranges (PK–5, 6–8, and 9–12). After accounting for these differences, we can predict how much charter schools would spend if they were treated as traditional public schools given their existing student needs and grade configurations. We will then compare charter schools' actual spending levels with the "as-if-traditional" spending estimates to determine whether charter school spending levels are different from those expected of otherwise-similar traditional public schools.

Adequacy Analysis: The Professional Judgment Panel Approach

In addition, we propose to conduct an adequacy analysis of the cost of providing students equal educational opportunity using a professional judgment panel (PJP) approach. The approach relies on expert practitioners to describe the programming and resources that will most efficiently provide students an adequate opportunity to achieve state educational goals. The PJP process requires three main steps:

1. Specifying the educational goals and objectives of the state that define an adequate education.

2. Using PJPs consisting of expert practitioners to determine the programs and resources (staff and nonpersonnel) necessary to achieve the goals in a variety of school contexts defined by levels of student needs and enrollment size.

3. Translating the costs derived from the PJP resource specifications into actionable funding policy in the form of a viable funding formula.

The first step in this process requires defining the goals and objectives of the system of public education by addressing questions such as what academic and content standards have been set in the state, what levels of outcomes (e.g., proficiency rates on state assessments) are desired, and how the results are measured. Drawing upon extant documentation (i.e., state standards) and any published works describing public sentiment concerning the desired objectives of the public K–12 education system, the study team will develop a draft goals statement. We will then consult with the client to finalize this draft to establish an operational goals statement.

The second step involves recruiting and convening panels of experts (professional judgment panels) who, through a series of exercises, determine the resources required to achieve these established goals and objectives. As described in more detail in the sections that follow, we will

provide the panelists with research on best practices for serving different student populations and data on existing resource levels in Delaware's public schools to promote an evidence-based approach for defining the instructional programs and the resources necessary to efficiently deliver programming that will achieve the goals. Through a transparent process, the research team will use the types and quantities of school resources specified by the panels to determine the associated costs necessary to deliver an adequate education to the diverse population of students served by the public schools in Delaware.

In the third step, the study team will use the results of the costing-out exercise as the foundation for designing and suggesting improved school funding formulas for distributing resources to districts and charter schools. The funding formulas will necessarily address how best to distribute resources to allow for an equal opportunity for all students to achieve the educational goals. The remainder of this section provides further detail on implementation of the PJP approach to produce adequacy cost estimates and translating this into a funding formula.

Recruitment and Organization of Panels

In addition to developing the formal goals statement described previously, the study team's initial task will be to recruit and select panelists for the PJPs and design the organization of the PJP deliberation meetings. We propose to convene six independent PJPs with two panels from each of the state's three counties. We explicitly recognize the fact that there is no "one-size-fits-all" model and that districts serving different populations in different types of communities may face unique circumstances that impact the necessary programming, resources, and subsequent costs of an adequate education. Furthermore, we propose to convene two panels in each of the three counties to reduce the potential impact of outliers in the process of deliberation. The charge of each panel will be to develop descriptions of comprehensive school programs (inclusive of instruction, administration, instructional and pupil support, professional development, etc.) for elementary, middle, and high schools that will achieve the educational goals at a minimum cost for a series of school prototypical contexts defined by student needs (incidences of students from low-income families, ELs, and students with disabilities) and enrollment size. They must also specify the personnel and nonpersonnel resources necessary to support these programs, which will then be costed out by the study team. PJPs in each of the county categories will have multiple school prototypes to address that represent the most prevalent incidence levels of student poverty, ELs, and students with disabilities within their county.

Each panel will be composed of up to 10 educators: superintendent, principals and teachers covering each schooling level (elementary, middle, and high), a specialist in special education, an EL specialist, and a school business official. Through a comprehensive nomination and

review process, the study team will select multiple independent panels of expert educators from districts across the state. Panelists will be invited to attend a workshop in which they will be expected to carry out a series of tasks over the course of 2 to 3 days.[8] We will solicit panelist nominations using a standardized form sent to all school districts and education stakeholder organizations. The form will ask for the role and professional background of candidates (e.g., educational preparation, experience) as well as evidence of success in promoting student outcomes (especially for students with additional needs). A scoring rubric will be used to evaluate candidates and make final selections. To help with recruitment and to compensate panelists for their time commitment to the process, we will provide each with an honorarium of $1,000.

Conducting PJP Workshops and Compiling Costs

Prior to the PJP workshop, AIR will provide each panelist with a package of materials to review. The purpose of these materials is to aid the panels in developing cost-minimizing instructional program designs and corresponding resource specifications intended to generate the desired student outcomes defined in the goals statement. First, the packages will include evidence-based briefs consisting of a balanced review of the educational literature on the programs and resources thought necessary to successfully serve students from at-risk, EL, special education, and rural populations. Second, a set of resource profiles depicting pupil–teacher ratios and caseloads for other types of staff that are typical of elementary, middle, and high schools within the county will be generated and provided to panelists as a reference (i.e., to give them a picture of schools' current resource utilization). In addition, the package will include explicit exercise instructions, including a goals statement that provides a description of the outcomes that define an adequate education.

At the PJP deliberation meetings, each panel will be asked first to develop base comprehensive program designs for prototypical elementary, middle, and high schools (defined as low student need and of typical size) describing the services and resources that will achieve the adequacy definition, as defined in the goals statement, at a minimal cost. To ensure that panelists follow their charge to develop efficient school program prototypes, they will be reminded that their names will be made public in the final report along with detailed descriptions of the program designs they have developed. In addition, throughout the meetings trained facilitators will remind panelists that their program designs must be (a) capable of providing all students to achieve the outcomes described in the goals statement, (b) based on available evidence of best

---

[8] While our intention is to host the PJP workshops in person in set locations within each county, we realize that the COVID-19 pandemic has created a significant amount of uncertainty with respect to scheduling live engagements. Should it be impossible to arrange in-person meetings, the study team will facilitate the workshops virtually.

Analysis Plan: Study of Delaware School Funding

practices, (c) efficient so as to achieve the goals at a minimum cost, and (d) realistic in its design so as to have reasonable chance to be implemented.[9] The instructional program design document will describe in detail the structure of the prototypical schools with respect to a series of administrative, instructional, and other programmatic components such as professional development and extracurricular activities.

The base prototype exercises for which panels will be developing programs will be designed for average-sized schools with "low-need" demographic profiles (i.e., with low percentages of students eligible for free or reduced-price lunch, ELs, and who receive special education services) that are typical for each panel's locale type. After developing base-model instructional program designs for typical low-need elementary, middle, and high schools, each panel will be asked to specify the full-time equivalents of personnel and dollars devoted to nonpersonnel necessary to deliver their designs. These resource specifications will be entered by trained meeting facilitation staff into resource cost models (RCMs) maintained in Excel workbooks that are specific to each PJP. The RCMs will be projected for the panelists and will calculate in real time the costs associated with their resource specifications, which serves as an integral part of panel deliberations.[10]

After completing the base exercise resource specifications, each panel will be asked to modify their program designs and corresponding resource specifications for alternative school prototypes that varied with respect to student needs and size. Panels will first make modifications to their program designs and resource specifications for school prototypes that assume high levels of student poverty. Each panel will follow the poverty task with a series of three additional tasks that will require them to modify their base program designs and resource specifications based on schools with higher proportions of ELs and higher special education identification rates, respectively. Finally, each panel will be asked to modify the program design and resource specifications for typical elementary, middle, and high schools designated as relatively small within their locale type. This exercise will generate a set of school-level resource specifications from which estimates of adequate cost per pupil will be made that vary with respect to county, locale, schooling level, and school characteristics (incidence of student poverty, ELs, disability, and size).

The research team will then use the measures of adequate school-level per-pupil costs generated by the PJP prototype exercises to estimate a simple model for each grade level

---

[9] The study team has used the acronym GEER (goals, evidence, efficient, and realistic) in PJP meetings for previous studies to convey these points.
[10] Specifically, the RCM allows panelists to consider the cost implications of the specified resources and make tradeoffs to arrive at resource combinations that will support their program designs at minimum cost.

Analysis Plan: Study of Delaware School Funding

(elementary, middle, and high school). The model will determine the relationships between adequate cost and the pupil need and school size variables.[11] Projections of how adequate school-level per-pupil costs vary across all schools in the state will then be developed using actual data obtained from the Delaware Department of Education on student needs (percentages of low-income students, ELs, and students with disabilities) and school size. Finally, these estimates will be multiplied by each school's enrollment to project the total adequate school-level costs for every school in the state.

To arrive at district-level costs, the projected school-level adequacy costs will be aggregated across all schools within each district. Two additional components will then be added to cover the costs of (a) ancillary services to support special education programs and (b) overhead for district-level central administration and maintenance and operations.[12,13] Specifically, to arrive at the total cost of an adequate education for each district, the study team will add the school-level adequacy projections within each district and the costs of the district-level ancillary special education services. Finally, the team will apply the overhead rates to account for central administration and maintenance and operations.

The study team will form a project advisory panel to review the panel products and preliminary results in order to promote efficiency in the PJP designs and resource specifications.[14] Specifically, the school-level program designs, ancillary services, and preliminary cost estimates from these initial specifications will be presented at a virtual project advisory panel meeting conducted via webinar. In the meeting, representatives from each of the PJPs will present their program designs and resource specifications to the group. After this meeting, the panelists will meet virtually with the meeting facilitators to make final modifications to the program designs and resource specifications. The final cost estimates derived from this process will be used as the basis to develop the final projected costs of achieving adequacy.

Developing a Funding Formula

The final step of the PJP analysis will be to develop a formula capable of distributing levels of funding that provides an equal opportunity for all students to achieve the objectives defined in the goals statement, regardless of their needs (status with respect to poverty, EL, and special

---

[11] The general model representation is as follows:

$$\text{Adequate per-pupil cost} = f(\text{poverty, English learners, special education, enrollment})$$

[12] District-level ancillary services will be an additional resource specification exercise completed by the PJPs.

[13] Similar to previous studies (e.g., Levin et al., 2018), the study team will make use of the district-level fiscal data maintained by the Delaware Department of Education on central administration and maintenance/operation services spending to estimate appropriate overhead rates (based on scale of operation) for each district in the state.

[14] The project advisory panel will consist of representatives from each of the PJPs.

Analysis Plan: Study of Delaware School Funding

education) and other circumstances, such as the geographic location of their district.[15] The study team will use the school- and district-level costs of providing an adequate education to derive a state funding formula for its districts. Specifically, the calculated district-level costs will be allocated out to the school level and added to the PJP-generated school-level adequacy costs within each district. Then, regression analysis will be conducted to model how adequate per-pupil cost responds to each of the following school-level student needs and characteristics: student percentages of poverty, ELs, special education, enrollment shares in Grades 6–8 and 9–12, total school enrollment, and charter status. The analysis will generate a suggested formula that is fair and comprehensive and that minimizes incentives for districts to obtain additional funding through influencing formula factors that are within their control. The projected school-level costs generated using the formula will then be aggregated within districts to provide final district-level adequacy costs.

Comparing Results From Cost-Function and PJP Analyses

After completing both the cost-function and PJP analyses, we will compare results across the two to identify areas of consistency. For this component, we will make several sets of comparisons:

- *Overall projected costs.* From both the cost-function and PJP analyses, we will generate overall cost projections for each district. We will compare the cost projections from the two analyses to determine the extent to which they differ by district.

- *Formula components.* In addition to the overall projected costs from both the cost-function and PJP analyses, we will identify a base per-pupil cost and weights for various cost factors (e.g., grade levels, student needs/characteristics, school or district size). Therefore, we can compare the base per-pupil costs and the funding adjustment weights from both sets of adequacy analyses.

Interviews With District and Charter School Administrators

Along with the described administrative data analyses and the PJP analysis, we will conduct 1-hour interviews with district and charter school administrators. One purpose of these interviews will be to investigate service arrangements between charter schools and school districts, as described in the section on charter school comparisons. This information will help

---

[15] To address the influence of the geographic location of a district, we plan to explore the use of a formula adjustment that accounts for geographic variation of input costs. To do this, we will evaluate the degree to which the Comparable Wage Index for Teachers (developed by Professor Lori Taylor, the National Center for Education Statistics, and the U.S. Census Bureau; Cornman et al., 2019) distinguishes between price levels of educational staff across districts in Delaware.

Analysis Plan: Study of Delaware School Funding

us understand how spending reflected in expenditure data and documents is actually divided across students served in traditional school districts and charter schools. We will use the interviews to gauge district and charter school practitioners' perspectives of the strengths and weaknesses of the current funding system related to the following topics, in addition to other topics that the department may also want explored:

- Constraints and flexibility regarding the ability to raise additional needed revenue locally

- Constraints and flexibility regarding how funds and resources are used

- Transparency with respect to determining how much funding or resources districts and charter schools receive

To represent the full breadth of Delaware's districts and charter schools, we plan to conduct interviews with individuals from all districts and charter operators who are most knowledgeable about funding policies and spending decisions at their respective levels of decision making. In the case that multiple individuals from a given district or charter operator want to participate, we will conduct the interview as a focus group. Interviews will be conducted virtually. An outline of topics to be discussed will be sent ahead of time so participants are prepared.

Information from the interviews will be summarized in the final report to reflect the perspectives of district and charter school leaders. The findings concerning service-delivery agreements will help us determine how spending figures from extant expenditure data files should be divided across the students served in traditional districts and charter schools. The perspectives of district and charter school leaders around the ability to raise additional funds, how funds are used, and the transparency of the current funding system will build context around findings from the quantitative analyses of administrative fiscal data. The combination of this information will inform our policy recommendations and may help the department and other key education stakeholders engage in richer policy conversations in the future.

Simulating Alternative Policy Options

After conducting the data collection and analysis activities described above, we will generate policy recommendations and potential funding policy scenarios that will inform future school funding reform efforts in the state. To demonstrate how the recommendations and scenarios would play out with respect to the distribution of funding across districts within the state, we will simulate funding distributions under the proposed scenarios and compare the simulated funding distribution to the distribution of actual funding. In addition, we will show how simulated funding levels could be supported under different scenarios of revenue generation

identifying state and local funding obligations. Simulating funding formula alternatives involves the following two steps:

- Simulating projected funding based on recommended proposed policy changes to show how districts and charter schools would be funded

- Determining local revenue capacity to finance equal educational opportunity across Delaware, simulating how much local revenue would be raised under equitable tax policies, and determining resulting state obligations

To simulate expected funding based on recommended changes, we will model how funding would be allocated to schools based on a recommended system of school funding. We will convert our recommendations into a formula that we can use to simulate the distribution of funding in Delaware, accounting for each district's incidences of student need and characteristics. We will then compare simulated funding from the recommended formula with actual spending in each district using the most recent year of fiscal data to show how changes in the funding formula would affect the distribution of resources across districts. We will show the results of the simulations visually using figures. We will also provide a simulator tool and accompanying documentation to the Delaware Department of Education, which will allow stakeholders to examine how changes to a model funding formula affect funding levels in each school district.

References

Baker, B. D., Di Carlo, M., Reist, K., & Weber, M. (2021). *The adequacy and fairness of state school finance systems*. Albert Shanker Institute.

Baker, B. D., Kearns, C., Atchison, D., Levin, J. (2020). *State finance reform vignettes: New Jersey.* American Institutes for Research.

Baker, B. D., Weber, M., Srikanth, A., Kim, R., & Atzbi, M. (2018). *The real shame of the nation: The causes and consequences of interstate inequity in public school investments*. Rutgers University.

Chambers, J., & Levin, J. (2009). *Determining the cost of providing an adequate education for all students*. National Education Association.

Cornman, S. Q., Nixon, L. C., Spence, M. J., Taylor, L. L., & Geverdt, D. E. (2019). Education Demographic and Geographic Estimates (EDGE) program: American Community Survey Comparable Wage Index for Teachers (ACS-CWIFT) (NCES 2018-130). U.S. Department of Education, National Center for Education Statistics.

Levin, J., Brodziak de los Reyes, I., Atchison, D., Manship, K., Arellanes, M., & Hu, L. (2018). *What does it cost to educate* California's *students? A professional judgment approach*. Policy Analysis for California Education.

Veney D., & Jacobs D. (2021). Voting with their feet: A state-level analysis of public charter school and district public school trends. National Alliance for Public and Charter Schools.

About the American Institutes for Research

Established in 1946, with headquarters in Arlington, Virginia, the American Institutes for Research® (AIR®) is a nonpartisan, not-for-profit organization that conducts behavioral and social science research and delivers technical assistance to solve some of the most urgent challenges in the U.S. and around the world. We advance evidence in the areas of education, health, the workforce, human services, and international development to create a better, more equitable world. The AIR family of organizations now includes IMPAQ, Maher & Maher, and Kimetrica. For more information, visit AIR.ORG.

AIR® Headquarters
1400 Crystal Drive, 10th Floor
Arlington, VA 22202-3289
+1.202.403.5000 | **AIR.ORG**