Alternative Approaches to Recalibration and Reconciliation of Study Results to Provide Final Recommendations

Prepared for the

Select Committee on School Finance Recalibration

By

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Contents

Supplemental Reports

I. Introduction

Augenblick, Palaich and Associates (APA) was chosen by the Wyoming Legislature's Management Council at the recommendation of the Select Committee on School Finance Recalibration to conduct a review of the current Wyoming Educational Program and a recalibration of the current Funding Model. APA is a nationally recognized expert in school finance issues with experience examining school finance formulas; estimating the resources needed for students, schools, and districts to meet state educational standards; and working with state policy makers to implement needed changes. APA was joined by national school finance expert Mike Griffith, William Hartman, and Bob Schoch of Education Finance Decisions; Shelley Billig and Jennifer Weston-Sementelli of Denver-based RMC Research Corporation; Dan Player with the University of Virginia; and Dr. Jennifer Imazeki from San Diego State University. The study team has more than 100 years of combined experience studying school finance issues.

The study team focused on pairing its national expertise and knowledge with a deep understanding of the Wyoming context and perspective to determine if any changes to the educational program or funding model were necessary to ensure the state's students can be successful. Each proposed component of the study incorporated substantial Wyoming stakeholder participation. This report presents an overview of the study, as well as the study team's findings, final recommendations, and cost implications for the 2019-20 fiscal year.

Each of the study tasks that are the basis of the recommendations is briefly described below.

Review of Wyoming's Current Educational Program and Funding Model

The study team conducted a review of Wyoming's current educational program, set forth by Wyoming Statute 21-9-101 (the defined "basket of educational goods and services") and the curriculum of the Hathaway Scholarship program, as defined in Wyoming Statute 21-16-1307. The study team's curriculum experts from RMC Research conducted an initial analysis of the state's current educational standard compared to other benchmark states. APA also conducted interviews and listening sessions with stakeholders who are knowledgeable about the state's current and needed educational standards, including educators, the governor and staff, Wyoming Department of Education (WDE) staff, and leaders of key educational membership organizations. The study team also administered an online survey to gather additional feedback from other educators and the broader community. Recommendations were made based on expert review and feedback from Wyoming stakeholders. These recommendations were presented to the Select Committee in October and are included in the full report.

The study team also examined how the current funding model functions and how it has changed over time. The team conducted an equity analysis to examine horizontal equity, vertical equity, and fiscal neutrality. The equity analysis also included supplemental analyses regarding teacher salaries, regional and inflation adjustments, special education and transportation funding, and other uncontrollable cost factors faced by Wyoming schools and districts, such as size and geographic isolation. As part of the stakeholder interviews and meetings described previously, the study team also gathered feedback on the funding model through interviews, listening sessions, and the online survey.

The report on the review of the educational program and funding model can be found attached as Supplemental Report A. The equity study is included as Supplemental Report B. The review of teacher salaries, the regional cost adjustment, and the external cost adjustment is included as Supplemental Report C.

Alternative Approaches to Recalibration

The study team implemented three alternative methods for examining the resources needed to meet Wyoming's educational standards: the professional judgment approach, a modified successful schools/school districts approach, and the statistical approach.

The professional judgment approach relies on the expertise of Wyoming educators to identify the resources needed to meet the needs of students, schools, and districts. The study team conducted a series of eight professional judgement panels with educators from throughout the state to identify the personnel, non-personnel costs, technology, and additional programs needed to serve students at the base level, as well as the additional resources needed to serve at-risk, English Language Learner (ELL), special education, gifted and talented, and career and technical education (CTE) students. Specific resources identified were then compared to the current legislative funding model and the 2015 evidence-based study recommendations. The results of the PJ approach are presented in Chapter III of this report.

The second approach was a modified version of the successful schools approach. This approach identifies schools (or districts) that are outperforming their peers and attempts to understand how they are using their resources to accomplish this level of success. Schools were selected based on their performance in the state's accountability system. Based on three years of data, schools were selected if they were "Exceeding Expectations" in two of the three years, and at least "Meeting Expectations" in the third year. The study team reviewed staffing and expenditure data for all schools that met these criteria, and also conducted case study interviews at 12 of the successful schools to better understand the types of programs and services that are being implemented to attain high student success. The results of the successful schools approach are presented in Chapter IV of this report.

The third approach was the statistical approach, which attempts to determine relationships between expenditures and performance. Unfortunately, due to the limited number of schools in Wyoming, the statistical modeling was unable to produce valid and reliable results. Supplemental Report D presents the results of the attempted implementation of the statistical approach.

Additional Studies

The study team also examined opportunities for cooperatively providing and sharing services (such as for special education, transportation, and gifted and talented programming) between school districts. This analysis first included a detailed examination of both the reimbursement models for special education and transportation, a review of the literature, a survey of all districts to collect data on current cooperatively provided and/or shared services, and barriers that exist to cooperatively providing or sharing services.

The study team also evaluated consolidation opportunities to inform recommendations regarding what types of districts would be candidates for consolidation and under what conditions.

The report on the special education reimbursement model can be found in Supplemental Report E, the report on transportation can be found in Supplemental Report F, and the report on consolidation and shared services is included as Supplemental Report G.

Reconciliation of Study Results to Provide Final Recommendations

Following the in-depth review of the current educational program and funding model, examination of the alternative recalibration approaches, and additional studies, the study team gathered, compared, and reconciled all of the information to create a set of initial recommendations, which were presented at the November Select Committee meeting and in an earlier draft report. These recommendations have seen been refined through additional review and analysis, as well as gathering additional stakeholder feedback. Any modifications to draft recommendations will be noted in this report. Further, the cost implications of the overall set of recommendations will be presented in the final chapter.

II. Background

This chapter provides some necessary background information on the current educational program, funding model, and the Campbell court decisions that guide the state in how education funding in Wyoming is determined.

Educational Program

By law, the Legislature has established a basket of educational goods and services constituting the proper education to which Wyoming students are entitled, including a common core of knowledge and skills.

Common Core of Knowledge

1. Reading/language arts
2. Social studies
3. Mathematics
4. Science
5. Fine arts/performing arts
6. Physical education
7. Health and safety
8. Humanities
9. Career/vocational education
10. Foreign cultures and languages
11. Applied technology
12. Government and civics, including state and federal constitutions

Common Core of Skills

1. Problem solving
2. Interpersonal communications
3. Keyboarding and computer applications
4. Critical thinking
5. Creativity
6. Life skills, including personal financial management skills

The Common Core of Knowledge and Common Core of Skills is implemented through content and performance standards by grade level developed by the State Board of Education in consultation and coordination with local school districts. The content standards are in nine content areas: language arts, math, science, social studies, fine and performing arts, foreign language, health education, physical education, and career/vocation training.

Special Needs Students[1]

Wyoming law requires that schools and districts offer programs designed to address the special needs of identified student populations, including:

- Students with disabilities (special education programs);
- Economically disadvantaged students;
- Students with limited English proficiency; and
- Gifted and talented students.

Schools and districts must also meet federal requirements for these students.

All basket components are "implemented and enforced by rule and regulation of the State Board of Education, to be of sufficient quality to prepare students for future postsecondary education or employment opportunities and participation as citizens." Successful completion of content standards is measured through performance on state and district assessments and mandatory graduation requirements.[2] Further, the state accountability and accreditation systems hold schools and districts accountable for providing students equal access to a quality education (as defined by the basket of educational goods and services) no matter where they live.[3]

Current Legislative Funding Model

Wyoming is one of few states whose financing of public school districts must be cost based, meaning that its funding must reasonably cover the actual costs of local school districts. This practice, along with other finance system elements impacting how the state funds school districts, the equity of the system, and how the construction and maintenance of facilities are funded have been shaped in important ways by a series of state Supreme Court decisions dating back to the 1980s.

The majority of the current funding model used to allocate funding to Wyoming's school districts has been in effect in its current form since the 2006-07 school year and has been refined since by the Legislature through multiple recalibrations. This funding model is based on the evidence-based adequacy model developed by Picus and Odden (Odden & Picus, 2014). Using the costs of educational strategies supported by research, the funding model allocates district funding according to the resource needs of each school along with the district services needed to support schools and students. The model is divided into the two primary areas: 1) school resources and 2) district resources. Within each of these areas the model further delineates resources as outlined below.

[1] W.S. 21-9-101
[2] Legislative Service Office
[3] State Board of Education

School Resources

School resources are determined for each district using a set of prototypical schools for elementary, middle, and high schools. Counts of students using average daily membership (ADM) at each school grade range are used to estimate the resources generated for each prototypical school. Special prototypes are used to estimate resources for very small schools with fewer than 50 ADM, alternative schools, and schools located in small districts with fewer than 243 ADM. Resources identified for these prototype schools include:

- Personnel, including core classroom teachers, elective/specialist teachers, CTE teachers, instructional facilitators or coaches, tutors, certified student support staff, librarians, school administrators, and classified staff.
- Supplies and materials and other items funded on a per-pupil basis, including gifted and talented programming, professional development, assessments, technology, CTE equipment, extra duty funds, and student activities.
- At-risk resources for programs for students requiring additional help to meet standards, including additional tutors and student support staff, programs for English language learners (ELLs), summer school and extended day programs, and alternative schools.

District Resources

Personnel resources are generated on the basis of a 3,500 ADM school district. Resources include central office personnel, such as the superintendent and other administrative professional and classified staff; and supplies, equipment and technology. Minimum staffing FTEs are also set for districts with 1,000 ADM and with 500 and fewer ADM. Staffing FTEs are prorated up or down for districts with ADM counts falling between these benchmark sizes.

Additionally, resources for maintenance and operations, including personnel such as custodians, maintenance workers, and groundskeepers; and non-personnel items, such as supplies and materials and utilities are also provided.

Reimbursements

This component consists of actual costs for which districts are reimbursed, including:

  - Special education;
  - Transportation;
  - Isolation and maintenance;
  - Special tuition; and
  - Teachers' extra pay.

Finally, the model incorporates certain adjustments used for calculating the foundation guarantee for each district, including the regional cost adjustment to account for cost-of-living differences across districts, an external cost adjustment to account for inflation and a hold harmless provision that prevents districts' foundation funding guarantee from falling below 2005-06 amounts.

The Impact of Education Finance Court Cases

The four Campbell cases decided by the Wyoming Supreme Court between 1995 and 2008[4] have played a significant role in shaping Wyoming's current model for funding its K-12 school districts (the legislative model).

In 1995, ***Campbell I*** found Wyoming's school finance system to be unconstitutional on both equity and adequacy grounds. As part of the remedy, the Court directed the Legislature to conduct a cost of education study and use the results to develop a new finance system that is cost-based and otherwise meets the requirements of the Constitution. The Court also found that the quality of school facilities constitutes a part of equal educational opportunity and that a finance system allowing for "deficient" facilities violates the Constitution. In summary, the Court concluded that:

> … the legislature must first design the best educational system by identifying the "proper" educational package (e.g. the basket of educational goods and services) each Wyoming student is entitled to have whether she lives in Laramie or in Sundance. The cost of that educational package must then be determined and the legislature must then take the necessary action to fund that package. Because education is one of the state's most important functions, lack of financial resources will not be an acceptable reason for failure to provide the best educational system. All other financial considerations must yield until education is funded.
>
> The state financed basket of quality educational goods and services available to all school-age youth must be nearly identical from district to district. If a local district then wants to enhance the content of that basket, the legislature can provide a mechanism by which it can be done. But first, before all else, the constitutional basket must be filled (Campbell, 1995).

Based on testimony from the lower court trial, the Court provided a list of some of the components indicative of a quality education (Campbell, 1995):

- Small schools
- Small class size and low student-teacher ratios
- Textbooks
- Low student-computer ratios
- An integrated, substantially uniform substantive curriculum
- Ample and appropriate provision for at-risk students, special problem students, and gifted and talented students
- Meaningful standards for course content and knowledge attainment intended to achieve the legislative goal of equipping all students for entry to the University of Wyoming, Wyoming community colleges, or achievement of other purposes of education

[4] *Campbell County School District v. State,* 907 P.2d 1238 (Wyo. 1995), also known as *Campbell I*; *State v. Campbell County School District*, 19 P.3d 518 (Wyo. 2001), also known as *Campbell III*; *State v. Campbell County School District*, 32 P.3d 325 (Wyo. 2001) *Campbell County School District*; and *Campbell County School District v. State,* 181 P.3d 43 (Wyo. 2008), also known as *Campbell IV*.

- Timely and meaningful assessment of all students' progress in core curriculum and core skills regardless of whether those students intend to pursue college or vocational training

In ***Campbell II*** (2001) the Court reviewed the following components of the funding model resulting from *Campbell I*: salaries, benefits, class sizes, maintenance and operations, transportation, special education, at-risk students, gifted and talented education, an external cost adjustment, a small school adjustment, a small school district adjustment, and a regional cost adjustment (Hewitt, 2017). It also found the financing system for facilities, which was primarily locally financed, once again unconstitutional.

Specifically, the Court ruled on each component as follows:

- **Salaries and benefits**: the Court noted that a finance system could not be considered adequate if it did not reflect the actual cost of teachers necessary to "deliver the basket." It supported the adjustment of teachers' salaries for educational attainment and experience, but found salaries for administrators and classified employees, which were not adjusted, unconstitutional because they were not cost based.

- **Class size**: The Court did not recommend specific class sizes, but noted that they are among the most important elements of a quality education. It also noted the body of research supporting small elementary school class sizes.

- **Maintenance and operations**: The Court found that using historical spending averages was not constitutional because more accurate cost measures were available.

- **Transportation and special education**: The Court upheld the model's reimbursement of 100 percent of the previous year's costs. Spending increases above the prior year's levels were not reimbursed until justified as necessary, in which case they would be reimbursed the following year.

- **Educating special needs students**:

    - Economically disadvantaged: The funding model at the time provided $500 per student eligible for the federal free and reduced-price lunch program. The Court found this unconstitutional for multiple reasons, including: 1) the amount had no relation to the actual costs of serving these students, 2) the model did not fund eligible students in schools with concentrations below the state average, and 3) free and reduced-price lunch counts were not representative of all economically disadvantaged students.

    - English language learners (ELLs): The funding model provided $900 per ELL pupil once an ELL student concentration threshold was reached. The Court found this approach unconstitutional because the $900 was not cost based. It suggested that reimbursement of actual, approved expenditures would be preferable.

- Gifted and Talented: The model at the time provided $9 per ADM. The Court accepted this because it found adequate evidence was not available to demonstrate that this amount did not meet constitutional requirements.
- Career and Technical Education (CTE): The funding model did not provide any additional funding for CTE programs. The Court ruled that it needed to be funded on a cost basis.

- **External Cost Adjustment:** The Court ruled that for the model to remain constitutionally cost based it must be adjusted for inflation at least every two years. It approved of the use of the WCLI since it was generally accepted by the education community, but other adjustments could be used as long as they ensured that funding under the model remained adequate.

- **Small school adjustment**: The court found that small school size thresholds must be cost based and could not be set arbitrarily. Similarly, the expenditure areas subject to an adjustment must also be justifiable and cost-based.

- **Small school district adjustment**: The court found no evidence to support the inclusion of a small district adjustment and found the adjustment in place in the funding model unconstitutional.

- **Regional cost adjustment**: The Court found that the regional cost adjustment used (in this case the WCLI) should be applied to several components that were not being adjusted, including: 1) medical costs and 2) housing costs (specifically rental costs). Again, the adjustment must be applied in a way that ensures the model is cost based.

The 2001, ***Campbell III*** decision dealt with the ongoing issue of capital facilities funding. In both *Campbell I* and *Campbell II* the Court found the system reliant largely on local bonding was unconstitutional because it did not ensure equal educational opportunity for all students across the state. The Court upheld the use of a facilities condition scoring system developed by MGT to determine eligibility for state funding assistance, but ruled that the standard for assistance – "inadequate" and "in need of immediate capital construction" – was unconstitutional. The Court stated that the standard for state capital construction funding should be whether or not a facility is "in a condition where only routine maintenance is required." The Court also said a new scoring system could be developed for future facilities ratings. Further, the Court stated that districts were no longer required to reach a 90 percent level of bonded indebtedness to qualify for state funding. Finally, the Court sought to clarify the state's obligation for supporting school facilities by stating that it was only required to provide funding needed for facilities capable of providing the "educational services determined appropriate by the State of Wyoming." Districts that wanted facilities exceeding this standard would need to look for other sources of funding.

In *Campbell IV* (2008) the Court once again reviewed various components of the funding model, which had been recalibrated following the *Campbell II* decision. The model components reviewed included: salaries and benefits, class size, maintenance and utilities, at-risk students, CTE, small school adjustment, small district adjustment, regional cost adjustment, external cost adjustment, and preschool funding.

The Court ruled on each component as follows:

- **Salaries and benefits**: In this decision, the Court found that model salaries, even though they were consistently below actual salaries paid, were adequate because they were sufficient to attract and retain teachers and had been increased significantly over time. The Court stated that the model did not need to match real time costs and that differences between model funding levels and actual costs will differ to some extent.

- **Class sizes**: Even though class sizes were not challenged in *Campbell IV*, the Court noted that those established in the original funding model – 16:1 in grades K-5 and 21:1 in grades 6-12 – seemed appropriate, were smaller than in most other states, and no evidence was available supporting adopting smaller class sizes.

- **Maintenance and utilities**: Maintenance funding at this point in time was based on the recommended square footage amounts developed by the School Facilities Commission. In an effort to encourage districts to eliminate excess space, this recommended amount, regardless of the actual size of a facility, was phased down to 115 percent of the applicable allowable square footage. Utilities were funded based on average actual costs and adjusted via the recalibration process. The Court upheld these funding measures although it expressed some concerns about inequities caused by funding maintenance based on permissible square footage and urged the state to assist districts in cases where excess capacity is not the fault of the district.

- **At-risk students**: The Court upheld a new at-risk counting mechanism consisting of mobility, eligibility for free and reduced-lunch and ELL counts. It also upheld a funding formula that increased funding to districts with higher concentrations and reduced it for those with lower concentrations. The court noted that it is difficult to determine the exact cost of serving at-risk students because the approaches are so varied across districts.

- **CTE:** The Court upheld a new funding approach based on an extensive study of the costs of delivering CTE, including smaller class sizes and additional funding for materials and equipment. Although the state still did not fully fund all requests for equipment funding, the Court upheld the practice because equipment constituted a relatively small percentage of CTE spending. The Court also noted that "no one has suggested that every school must have exactly the same vocational opportunities."

- **Small School Adjustment:** The Court upheld the current adjustment which was based on a state sponsored study, was based on data and contained no arbitrary cutoffs.

- **Small District Adjustment:** The Court upheld this adjustment as well, noting that the state had studied the issue and developed a cost-based approach.

- **Regional Cost Adjustment (RCA):** At the time of the decision, the WCLI used for the RCA included the medical and rental cost components that were excluded at the time of the *Campbell II* decision. However, the RCA-adjusted districts with lower than average costs by a factor of less than 1.0. The Court ruled that the floor for the adjustment must be the statewide average teacher salary.

- **External cost adjustment**: The Court upheld the state's inflation adjustment, stating that as long as the model is based on historic average costs it must be adjusted for inflation to maintain adequacy.

- **Cost plus funding**: Between *Campbell II* and *Campbell IV*, the state often provided funding in excess of the amount generated by the funding model. Districts argued that this was evidence that the model itself was inadequate, but the Court disagreed, stating that additional funding between recalibrations is the prerogative of the Legislature.

- **Pre-school funding**: The plaintiffs in the case argued that the educational benefits of prekindergarten warranted state funding for voluntary preschool programs. The Court ruled that the constitution only mandated state-supported education for children between the ages of six and 21, therefore preschool funding is not required as part of the model.

Alternative Approaches to Recalibration

The concept of adequacy as it relates to education funding grew out of the standards based reform movement. As states implemented specific learning standards and performance expectations for what students should know, along with consequences for districts and schools failing to meet these expectations (and, eventually, federal expectations imposed through No Child Left Behind and continued by the Every Student Succeeds Act), the focus of school finance shifted to an examination of the resources necessary to provide districts, schools, and students with reasonable opportunities to achieve state standards. Over the past two decades, researchers have developed four approaches to creating estimates for the level of funding necessary to provide all students with the opportunity to receive an adequate education:

1. The **evidence-based** approach assumes that information from research can be used to define the resource needs of a prototypical school or district to ensure that the school or district can meet state standards. The approach not only estimates resource levels but also specifies the programs and strategies by which such resources could be used efficiently. The evidence-based approach also incorporates educator feedback through a review process and makes adjustments to the model as long as they can be substantiated by research. The evidence-based approach is the primary basis for the current legislative funding model.

2. The **professional judgment** approach was first used in Wyoming in the mid-1990s and has since become one of the most widely used adequacy approaches. The professional-judgment approach begins with evidence-based research but relies on and defers to the experience and expertise of educators in the state to identify the resources needed to ensure that all districts,

schools, and students can meet state standards and requirements. Resources include school-level personnel, non-personnel costs, additional supports and services, technology, and district-level resources. The PJ approach identifies both base resources and adjustments for special needs students.

3. The **successful schools/school district** approach determines an adequate resource level by examining the expenditures of schools or districts that are currently outperforming other schools on state performance objectives. This approach assumes that every school and school district, in order to be successful, needs the same level of resources that is available to the most successful schools and districts. The approach typically does not provide the study team with detailed information on the types of programs or interventions being employed by the schools.

4. The fourth approach, the **cost function (or statistical)** approach, is an econometric method that estimates the level of funding needed to achieve a given level of student achievement as measured on assessments while controlling for student and district characteristics. The statistical approach is used infrequently in comparison to the other approaches given the detailed data required.

Given that the foundation of the current funding model was a 2015 evidence-based study, the study team did not conduct a new study with this approach but instead included its results as a data point for recalibration. The study team instead implemented the other three approaches to adequacy as part of the recalibration study. The study team believed that Wyoming would benefit from utilizing additional approaches when recalibrating as doing so provided several distinct advantages. First, each adequacy approach utilizes a unique method, ensuring that the final adequacy estimate is derived from multiple perspectives and multiple sources of data. Second, each approach has certain strengths and weaknesses. By using multiple approaches, the weaknesses of one approach are compensated for by the results and insights of the other approaches. Finally, the results of multiple approaches serve as a check on the validity of each approach's estimate of resource needs, and may highlight outliers in the results of a single approach. In some cases, the results of multiple approaches may help to explain the reasons behind differences in the resource estimates.

The following chapters present two of the alternative approaches to recalibration, professional judgment and successful schools, with Chapter V presenting the reconciliation of those results and the study team's final recommendations, and Chapter VI detailing how recommendations are implemented to calculate adequate resources for schools and districts as well as full cost estimates for the state. Supplemental Report C presents the results of the statistical approach, which due to data limitations was not able to produce valid and reliable results and is therefore excluded from consideration.

III. Professional Judgment Approach to Adequacy

The professional judgement (PJ) approach relies on the experience and expertise of educators in the state to identify the resources needed to ensure all districts, schools, and students can meet state standards and requirements. In Wyoming, this is specifically the required basket of educational goods and services, as well as any related requirements (such as assessments and the accountability system). Resources include school-level personnel, non-personnel costs, additional supports and services, technology, and district-level resources. These resources are first identified for students with no identified special needs (which allows for the calculation of a base set of resources) and then separately for special needs students, presented as adjustments, or “weights.”

Creating Representative Schools and Districts

The PJ approach estimates the costs of adequacy by developing representative schools and one or more representative districts. Representative schools are designed using statewide average characteristics to resemble schools across the state. This includes identifying both averages for school sizes and grade configurations, as well as identifying average demographics for at-risk, English Language Learners (ELLs), and special education students. Note that in Wyoming, ELL is currently a part of the at-risk definition but was considered separately during the PJ panels.

The study team disaggregated Wyoming districts into five size categories: 0–200 students, 201–750 students, 751–1,500 students, 1,501–5,000 students, and more than 5,000 students. Within each size category, the study team examined average grade configurations and average school sizes. Based on this information, the study team created three different representative elementary schools (150 students, 210 students, and 300 students), three middle schools (150 students, 300 students, and 525 students), three high schools (200 students, 400 students, and 1,000 students), and one K-12 school of 104 students. The study team also created five representative district sizes: 104 students (meaning the K-12 school was also a K-12 district), 500 students, 1,200 students, 3,025 students, 5,000 students, and 10,700 students. Creating representative schools and districts was done in this manner for a number of reasons. First, it ensured representative schools would be familiar to panels and enabled panel discussions to address resources for an average school size statewide, and then an additional school that was larger and one that was smaller to tease out the variation in resources needed due to school size and resulting economies or diseconomies of scale. By understanding the relationship between size and resources, it allows for the identification of resources in the wide variety of circumstances seen in Wyoming and allows for the creation of a size adjustment to reflect these circumstances. It also gave the study team the greatest flexibility in the type of funding system that could be recommended in the end (either school or district level).

For student needs populations, the study team used the statewide averages[5] for each student group and special education was disaggregated into three categories: mild, moderate, and severe, based on the

[5] For at-risk the state’s average percentage of students eligible for free and reduced price lunch was used. Note, that the state’s current definition includes ELL and mobility.

percentage of time students spent in the general education classroom (80 percent, 40 to 80 percent, and less than 40 percent, respectively).

Table 3.1 identifies the representative schools and districts for Wyoming, including demographics.

Table 3.1
PJ Representative Schools and Districts

Representative Districts	
Very Small	104
Small	500
Moderate	1,200
Large	3,025
Very Large	10,700
Representative Schools	
Elementary	150, 210, 300
Middle	150, 300, 525
High	200, 400, 1,000
K-12	104
Special Needs Populations	
At-Risk	38%
ELL	3%
Special Education	14%
Mild	*9%*
Moderate	*3.50%*
Severe	*1.50%*

Professional Judgment Panel Design

Based on experience using the PJ approach in other states, the study team felt that it was best to use multiple levels of PJ panels. There are a number of reasons for doing so: (1) multiple panels allow for the separation of school-level resources (which include teachers, supplies, materials, and professional development) from district-level resources (which include facility maintenance and operation, insurance, and school board activities); and (2) the study team believes strongly in having each panel's work reviewed by another panel for an effective consensus approach.

The PJ panel structure in Wyoming was designed as follows:

1. **School-level panels**: The study team first held three school-level panels based on grade level (elementary, middle, and high school). Each of these panels focused first on the resources needed to serve students with no special needs. Then, they identified the additional resources needed to serve at-risk students. A separate webinar was held to discuss resources needed in the K-12 school/district.

2. **Special needs panels**: Next, two special needs panels (one for special education and one for at-risk/ELL) were held to review the work of the previous panels that identified the resources for the base and for at-risk students and then identified the additional resources needed to serve

special education and ELL students. A third special needs panel was held via webinar to discuss CTE.

3. **Statewide panel**: The final panel reviewed the work of the previous school-level and special needs panels, resolved any inconsistencies, and then identified the needed district-level resources.

Panelists included classroom teachers, principals, personnel who provide services to students with special needs, superintendents, technology specialists, and school business officials. Panelists were identified by Wyoming professional associations and supplemented with nominees from the Wyoming Department of Education (WDE) as needed. In total, about 65 panelists participated in eight PJ panels. A list of panel members is provided in Appendix A to this report.

Panels were held from September to November 2017 in Casper, Wyoming. Table 3.2 provides the dates of these meetings.

Table 3.2
PJ Panel Dates

Date	Panel
September 12-13, 2017	Elementary School Panel, Middle School Panel
September 14-15, 2017	High School Panel
October 11, 2017	Special Education Panel, ELL Panel
October 22, 2017	CTE Panel
October 30, 2017	K-12 School/District Panel
November 2-3, 2017	Statewide Review Panel

Summarizing Wyoming's Basket of Educational Goods and Services

Prior to the commencement of any PJ panel discussions, all panelists first reviewed a specific set of background materials and instructions prepared by the study team. Panelists were instructed that their task was to identify the resources needed to provide the required basket of educational goods and services and to offer opportunities for students to meet the Hathaway Scholarship eligibility requirements, as well as additional related requirements for schools and districts around assessment, accountability, and accreditation. The study team prepared a brief summary document of these standards and requirements, which was reviewed by the Wyoming Legislative Service Office. This document was then shared with panelists (Appendix B). The document was not meant to be exhaustive, as all panel participants were experienced educators in Wyoming. Panelists were also instructed that their role was not to build their "dream school" but instead to identify the resources needed to provide the basket of educational goods and services in an effective and efficient manner. The instructions and background information used at the PJ panels can be found in Appendix C.

PJ Panels: Using Best Practice Research and Professional Association Recommendations

The study team provided the PJ panels with some starting point figures from a review of best practice research and with staffing recommendations that were available from professional educator associations. The research-based figures are similar to resources identified in prior evidence-based work in Wyoming, but varied in a few areas, such as class-size recommendations (presented as a range instead of specific figures at the elementary level) reflecting the study team's updated review of the research. These figures were used to prompt discussion, and panelists were in no way constrained by these recommended figures. Instead, they could adjust the figures as they saw fit to best suit Wyoming and add in additional necessary staffing positions that were not addressed in the starting point figures.

The following tables summarize the starting point figures that were shared with the panelists based on the team's research review and recommendations from professional associations. Figures are shown for the average size school in each category.

Table 3.2

Research-Based and Professional Association Starting Point Personnel Figures

Elementary School of 210 Students

Personnel Position	Research-Based Starting Figures	Professional Association Starting Figures
Instructional Staff		
Classroom Teachers	9.8–12.8	12.1
Specials Teachers (art, music, PE, world language, etc.)	2.0–2.6	
Instructional Facilitators (Coaches)	2.1	
Teacher Tutors/Interventionists	1.0	
Librarians/Media Specialists	1.0	1.0
Pupil Support Staff		
Counselors	0.8	0.8
Nurses	0.3	0.3
Psychologists		0.6
Social Workers		1.1
Family Liaisons		
Administrative Staff		
Principal	0.3	0.3
Assistant Principals	0.5	0.5
Secretaries/Clerks	2.0	
Other Staff		
IT Technicians		0.8

The study team's research review produced a range of class sizes that were shown to positively impact student success, from 15–20 in kindergarten through third grade and from 20–25 in fourth and fifth grades. The National Education Association recommended class sizes of 15:1 in kindergarten through third grade, then small class sizes in higher grades but not a specific figure. The study team therefore used 25:1 for fourth and fifth grades to create a comparison starting point figure. Other specials teachers were also recommended at a level of 20 percent of core teachers. Other key recommendations out of both the research and professional association recommendations were related to counselors (both the research and the American School Counselor Association recommended staffing at 250:1), librarians (both sources recommended one per school), nurses (some research recommended one per school, but the National Association of School Nurses recommended staffing at 750:1 for the general student population), and principals (one per school). The research review also recommended instructional coaches, technology specialists, teacher tutors/interventionists, clerical staff, and duty aides. Additional professional association recommendations were 500:1 to 700:1 for psychologists, based on school need (National Association of School Psychologists), 400:1 for social workers (School Social Work Association), the addition of an assistant principal (one per school at the elementary and middle school level, one or more at the high school level, as recommended by the National Association of Elementary School Principals and National Association of Secondary School Principals), and 250:1 staffing for IT positions (International Society for Technology in Education, NETS Standards).

Table 3.3
Research-Based and Professional Association Starting Point Personnel Figures
Middle School of 300 Students

Personnel Position	Research-Based Starting Figures	Professional Association Starting Figures
Instructional Staff		
Teachers	16.0	16.0
Instructional Facilitators (Coaches)	3.0	
Teacher Tutors/ Interventionists	1.0	
Librarians/Media Specialists	1.0	1.0
Media Aides		1.0
Pupil Support Staff		
Counselors	1.2	1.2
Nurses	0.4	0.4
Psychologists		0.4
Social Workers		0.8
Administrative Staff		
Principal	1.0	1.0
Assistant Principals		1.0
Secretaries/Clerks	2.0	
Other Staff		
IT Technicians		1.2

The research review recommended class sizes of 25:1 on a block schedule (defaulting to the recommendations of prior EB reviews, in absence of more compelling research otherwise), with teachers instructing three out of four blocks. As noted, there was not a specific class-size recommendation from the professional associations, so a specific figure was not included as a starting point. All other staffing positions used similar ratios as the elementary recommendations.

Table 3.4
Research-Based and Professional Association Starting Point Personnel Figures
High School of 400 Students

Personnel Position	Research-Based Starting Figures	Professional Association Starting Figures
Instructional Staff		
Teachers	21.3	21.3
Instructional Facilitators (Coaches)	2.0	
Teacher Tutors/ Interventionists	1.0	
Librarians/Media Specialists	1.0	1.0
Media Aides		1.0
Pupil Support Staff		
Counselors	1.6	1.6
Nurses	0.5	0.5
Psychologists		0.6
Social Workers		1.0
Administrative Staff		
Principal	1.0	1.0
Assistant Principals		1.0
Secretaries/Clerks	2.0	
Other Staff		
IT Technicians		1.6

For the high school level, the research review recommended the same class sizes (25:1) and schedule (four period block) as the middle school level. As noted, there was not a specific class size recommendation from the professional associations, so a specific figure was not included as a starting point. All other staffing positions used similar ratios as the elementary recommendations.

The study team also provided starting point figures from the research review for non-personnel costs, as shown in Table 3.5.

Table 3.5
Research-Based Starting Figures for School-Level Non-Personnel Costs

Cost Category	Research-based Starting Figures		
	Elementary School	**Middle School**	**High School**
Professional Development	10 days per teacher; $100 per student	10 days per teacher; $100 per student	10 days per teacher; $100 per student
Supplies and Materials	$165 per student	$165 per student	$200 per student
Student Activities	$250 per student	$250 per student	$250 per student

It is important to note that the study team's research review did not identify resources beyond the school-level items listed above (e.g. district-level resources).

Professional Judgment Panel Procedures

Once panelists were provided with instructions and background information to guide their efforts (as described previously), PJ panels convened and followed a specific procedure. At least two study team members attended each panel meeting to facilitate the discussion and to take notes about the level of resources needed as well as the rationales behind participant decisions. Panelists were frequently reminded that they should be identifying the resources needed to meet state standards in the most efficient way possible without sacrificing quality.

Each panel discussed the following **school-level** resource needs:

1. **Personnel**: classroom teachers, other teachers, psychologists, counselors, librarians, teacher aides, administrators, nurses, etc.
2. **Other personnel costs**: use of substitute teachers and time for professional development.
3. **Non-personnel costs**: supplies, materials and equipment costs (including textbook replacement and consumables), plus the costs of offering extracurricular activities.
4. **Non-traditional programs and services**: before- and after-school programs, preschool, and summer school programs.
5. **Technology**: hardware, software, and licensing fees.

District-level panels also addressed the following **district-level** resource needs:

1. **Personnel**: central office administrators, special programs directors and coordinators, and support staff.
2. **Non-personnel costs**: maintenance and operations, insurance, safety and security, assessment, and contract services.

PJ panels first identified the above resources for students with no special needs, and then addressed the additional resources needed to serve special needs students (at-risk, special education, and ELL). Keeping these costs separate allowed for the creation of a base set of resources and additional special needs weights (discussed in greater detail later in this report).

As described in the previous section, the study team provided PJ panelists with starting point figures, in a limited number of personnel categories, from both the study team's research review as well as recommendations from professional associations. These figures were used to prompt discussion, and panelists were in no way constrained by these recommended figures or limited to these personnel categories. Instead, they could identify resources as they saw fit to serve Wyoming students best.

For each panel, the figures the study team recorded represent general consensus among members. At the time of the meetings, no participant (either panel member or study team member) had a precise idea of the costs of resources being identified. (The study team's costing of resources took place at a later date.) This is not to say that panel members were unaware that higher levels of resources would produce higher base cost figures or weights. However, without specific price information and knowledge of how other panels were proceeding, it would have been impossible for any individual or panel to suggest resource levels that would lead to specific funding amounts, much less to costs that were relatively higher or lower than others.

Professional Judgment: Resources Identified

The following key resources were identified by the PJ panels:

- Class sizes somewhat larger than in the current funding model, but closer to actual practice. The recommended class sizes were 16:1 in kindergarten through second grade, 18:1 in third grade, 22:1 in fourth and fifth grades, 23:1 in sixth through eighth grades, and 22:1 in eighth through 12th grades for the largest size school. Some smaller class sizes were recommended in the smaller schools to account for the need for more staff to provide needed course offerings to meet the basket of educational goods and services and the requirements for Hathaway eligibility.
- Significant time for teacher planning, collaboration, and embedded professional development with instructional coaches. At the elementary level, this in part led to staffing electives at 20 percent of core teachers. At the secondary level, panelists discussed a schedule of either students taking eight periods a day, with teachers instructing six, or a block schedule of four blocks, with teacher instructing three out of four. Mathematically, this translates to staffing electives at 33 percent of core teachers. Given the amount of time available within the school day for professional development, the panels did not indicate a need for any additional professional development days beyond what is currently provided.
- A high level of student support (including counselors, social workers, and behavior specialists at the discretion of the school) available for all students at a ratio of 1.0 FTE per 200 students.
- Technology-rich learning environments, including 1:1 student devices (primarily Chromebooks), and associated IT support.
- Before- and after-school programs and school-level summer school for at-risk students.
- Language acquisition instructional staff (teachers and instructional aides) and translation support for ELL students.
- Teachers, aides, and related service professionals to serve special education students.
- Voluntary, half-day preschool for all at-risk four-year-olds.
- Funding for non-personnel costs, such as supplies and materials, and student activities, at a level equal to actual district expenditures in these areas.

It should be noted that the resources PJ panels identified here are examples of how funds might be used to organize programs and services in representative situations but are not intended to be prescriptive. The study team cannot emphasize strongly enough that the resources identified are not the only ways to organize programs and services to provide the basket of educational goods and services. Instead, the purpose of the exercise is to estimate the overall level of resources and therefore the cost of adequacy, and not to determine the best way to organize schools and districts.

School-Level Personnel

PJ panels discussed and recommended staffing, including:

- **Instructional staff:** teachers, instructional aides, instructional coaches, interventionists, librarian/media specialists, and technology specialists.
- **Pupil support staff:** counselors, social workers, and behavior specialists (collectively), as well as nurses.
- **Administrative staff:** principals, assistant principals, office managers, and clerical staff).
- **Other staff members:** school resource officers and IT technicians.

Tables 3.6A through 3.6C first identify the school size, and the panel-recommended average class size. The tables then identify the personnel on a FTE basis needed to serve all students, regardless of need, at elementary, middle, and high school settings (base education). Subsequent tables identify the additional personnel needed to serve special needs students. For comparison purposes, the resources for the K-12 school are disaggregated into the three grade bands using the same grade distribution (K-5, 6-8, 9-12).

As noted previously, separate panels at each level identified these resources, and as a result, specific resources and approaches may vary from level to level. The identified resources are not intended to be prescriptive, so no one approach is recommended.

Table 3.6A
Elementary School Personnel as Recommended by Wyoming PJ Panels, Base Education

School Configuration and Size	K-5 (in K-12), 48 students	K-5, 150 students	K-5, 210 students	K-5, 300 students
Average Class Size	8:1 *(based on 1 teacher per grade)*	15:1	17:1	18:1 (*based K-2: 16:1, 3: 18:1, 4-5:22:1)*
Instructional Staff				
Teachers	6.0	10.0	12.0	17.0
Specials Teachers	1.5	2.0	2.4	3.5
Instructional Facilitators (Coaches)	0.5	0.8	1.0	1.4
Teacher Tutors/ Interventionists		0.5	0.7	1.0
Librarians/Media Specialists	0.5	0.5	0.7	1.0
Technology Specialists	0.5	0.4	0.5	0.7
Library/Media Aides		0.5	0.3	
Instructional Aides (Paraprofessionals)	0.5	1.5	2.1	3.0
Pupil Support Staff				
Student Support (Counselors, Social Workers, Behavior Specialists)	0.3	0.8	1.1	1.5
Nurses	0.5	1.0	1.0	1.0
Administrative Staff				
Principal	0.5	1.0	1.0	1.0
Office Manager		1.0	1.0	1.0
Clerical Staff	1.0	1.0	1.0	1.5
Other Staff				
IT Technicians		0.6	0.8	1.2
Supervisory Aides		1.0	1.4	2.0

Panelists identified average class sizes in an elementary school of 16:1 in grades K-2, 18:1 in third grade, and 22:1 in fourth and fifth grades, resulting in an 18:1 average class size across all grades. However, the panelists also discussed the practical realities of staffing in smaller settings and an increased FTE need in schools as their size decreased in order to ensure staff could be certified in the content areas and grade levels taught, as well able to address the needs of students in their classrooms. This is reflected both in the FTE shown and a computed average class size across all grades based on these diseconomies of scale. In a school of 210, the average class size would be 17:1; in a school of 150, it would be 15:1; and in the smallest school (with 1.0 teacher per grade), the class size would be 8:1. Panelists also identified other specials teachers to teach subjects such as art, music, physical education, and world language, and to allow for sufficient planning and collaboration time for classroom teachers (panels identified specific FTE amounts for each, at a level equivalent to 20 percent of core teachers for most school sizes). The panelists also identified instructional coaching for teachers by instructional facilitators (coaches), staffed at 1.0 FTE per 15 teachers. Panelists recommended staffing technology specialists at 1.0 per 30 teachers, and instructional support for students at a ratio of 300:1 to provide intervention support in a Response to Intervention (RTI) system.

While many districts employee a library/media aide, particularly at the elementary level, panelists felt that students would receive a greater instructional benefit from a certified position at a ratio of 300:1. For schools under 300, they also recommended library/media aide support to equal a full 1.0 FTE less the portion of the certified position. Panelists also stressed the need for meaningful student support to address student social and emotional needs. They recommended staffing a general student support category position at 200:1. They also felt access to a nurse was crucial given the increasing health needs they are seeing in the general education population (such as diabetes). There was a lot of debate about what would be sufficient staffing in this area, concluding in a recommendation of 1.0 nurse per campus, which could be reduced in areas with schools in close proximity or in areas that had better emergency response time. A 1.0 principal and office manager was also identified (except for in the smallest school), as well additional clerical staff. Finally, IT staff was recommended at 250:1, and supervisory aides to oversee pick up/drop off, lunch, and recess at an FTE (not head count) level.

Table 3.6B
Middle School Personnel, as Recommended by Wyoming PJ Panels, Base Education

School Configuration and Size	6-8 (in a K-12), 24 students	6-8, 150 students	6-8, 300 students	6-8, 525 students
Average Class Size	8:1	23:1	23:1	23:1
Schedule	*Not addressed*	*4 period block or 8 period day; teachers teaching 75% of the day*		
Instructional Staff				
Teachers	4.0	8.7	17.4	30.4
Instructional Facilitators (Coaches)	0.2	0.6	1.2	2.0
Teacher Tutors/ Interventionists		0.5	1.0	1.0
Librarians/Media Specialists	0.2	0.5	1.0	1.8
Technology Specialists	0.2	0.3	0.6	1.0
Library/Media Aides		0.5		
Instructional Aides (Paraprofessionals)	0.2	0.5	1.0	1.8
Pupil Support Staff				
Student Support (Counselors, Social Workers, Behavior Specialists)	0.1	1.0	1.5	2.6
Nurses	0.2	0.5	1.0	1.0
Administrative Staff				
Principal	0.2	1.0	1.0	1.0
Assistant Principals			1.0	1.5
Office Manager		1.0	1.0	1.0
Clerical Staff	0.4	1.0	1.5	3.0
Other Staff				
IT Technicians		0.6	1.2	2.1
Supervisory Aides		1.0	2.0	3.5

For middle schools of 150 to 525 students, panelists felt that 23:1 was an appropriate average class size. Panelists also based their staffing of middle school grades on a block schedule with teachers instructing 75 percent of the day, but discussed that some schools may prefer to staff them similar to the elementary schools, and that the FTE identified would allow that flexibility. At the secondary level, the PJ approach makes no distinction between classroom and specials teachers and is instead presented as a total teachers figure. However, the number of teachers calculated by the schedule suggested is equivalent to the number of teachers generated by resourcing core teachers at the class size identified and providing electives at 33 percent of core teachers. Ratios for instructional support, student support, and IT technician support are the same as for elementary schools. Administration recommendations were similar, with the addition of assistant principals, which were recommended for schools with more than 300 students (at a level of 350:1 in the largest middle school).

Table 3.6C
High School Personnel, as Recommended by Wyoming PJ Panels, Base Education

School Configuration and Size	9-12 (in K-12) 32 students	9-12, 200 students	9-12, 400 students	9-12, 1,000 students
Average Class Size	8:1	19:1	22:1	22:1
Schedule	*Not discussed*	*four period block, or eight-period day; teachers teaching 75% of the day*		
Instructional Staff				
Teachers	5.5	14.0	24.2	60.6
Instructional Facilitators (Coaches)	0.3	0.9	1.6	4.0
Teacher Tutors/ Interventionists		0.6	1.3	2.5
Librarians/Media Specialists	0.3	0.7	1.0	1.0
Technology Specialists	0.3	0.5	0.8	1.0
Library/Media Aides		0.3		
Instructional Aides (Paraprofessionals)	0.3	1.0	1.0	2.5
Pupil Support Staff				
Student Support (Counselors, Social Workers, Behavior Specialists)	0.2	1.0	2.0	5.0
Nurses	0.3	1.0	1.0	1.0
Administrative Staff				
Principal	0.3	1.0	1.0	1.0
Assistant Principals			1.1	2.9
Office Manager		0.5	1.0	1.0
Clerical Staff	0.6	1.5	3.0	6.0
Other Staff				
IT Technicians		0.8	1.6	4.0
Supervisory Aides		1.0	2.0	5.0

For the average high schools, panelists recommended the same scheduling model, but a class size of 22:1 to allow for a wide range of courses to be offered so that students could meet all graduation requirements. The panelists also identified additional instructional support, student support, and IT support at the same ratios as earlier grades, and administration staffed at ratios similar to middle schools.

Tables 3.7A through 3.7F identify the additional resources needed to serve at-risk, ELL, special education, CTE, and alternative students. All resources identified for special needs are above and beyond the resources identified in the base.

It is important to note that the resources allocated at the district level (for example, related service professionals for special education) need to be considered in conjunction with these resources. District-level resources for special needs students can be found in Tables 3.12B.

Table 3.7A
Additional Personnel Needed to Serve At-Risk Students Identified by Wyoming PJ Panels

Elementary School	48 students (in K-12)	150 students	210 students	300 students
At-Risk Student Count (38%)	18 students	57 students	80 students	114 students
Teacher Tutors/ Interventionists	0.9	0.7	1.0	1.4
Instructional Aides		1.4	2.0	2.9
Student Support Staff		0.3	0.4	0.5
Middle School	24 students (in K-12)	150 students	300 students	525 students
At-Risk Student Count (38%)	9 students	57 students	114 students	200 students
Teacher Tutors/ Interventionists	0.5	1.0	1.9	3.3
Instructional Aides		1.0	1.9	3.3
Family Liaisons		0.3	0.5	0.9
Student Support Staff		0.3	0.5	0.9
High School	32 students (in K-12)	200 students	400 students	1,000 students
At-Risk Student Count (38%)	12 students	76 students	152 students	380 students
Teacher Tutors/ Interventionists	0.6	1.5	3.0	7.6
Student Support Staff		0.3	0.5	1.3
Family Liaisons		0.3	0.5	1.3

Panelists identified the need for additional interventionist support (at a ratio of 80:1 in elementary, 60:1 in middle school, and 40:1 in high school, decreasing in relationship to the ratio of instructional aides identified), instructional aides to support small group instruction in the classroom in elementary and middle schools (these instructional aides being in addition to those identified in the base), and student support beyond what was identified at the base level, including family liaisons to connect families to the school and their child's education.

Table 3.7B
Additional Personnel Needed to Serve ELL Students Identified by Wyoming PJ Panels

Elementary School	48 students (in K-12)	150 students	210 students	300 students
ELL Student Count (3%)	2 students	5 students	6 students	9 students
Teachers		0.1	0.1	0.2
Instructional Aides	0.5	0.3	0.4	0.6
Interpreters		0.05	0.1	0.1
Family Liaisons		0.2	0.3	0.4
Middle School	24 students (in K-12)	150 students	300 students	525 students
ELL Student Count (3%)	1 student	5 students	9 students	16 students
Teachers		0.1	0.3	0.5
Instructional Aides	0.25	0.3	0.6	1.1
Interpreters		0.05	0.1	0.2
High School	32 students (in K-12)	200 students	400 students	1,000 students
ELL Student Count (3%)	1 student	6 students	12 students	30 students
Teachers		0.2	0.5	1.2
Instructional Aides	0.25	0.4	0.8	1.0
Interpreters		0.1	0.1	0.3

Panelists identified resources to serve the language needs of ELL students. Panelists recommended ELL teachers at a ratio of 45 ELL students per 1.0 FTE in the elementary grades, decreasing to 35:1 in middle school, and 25:1 in high school, recognizing the increasing need to get ELL students proficient in English prior to graduation. Instructional aides were also recommended to provide additional push-in support in general education classrooms at a ratio of 15:1. Family liaison staff was also recommended in the earliest grades to build connections with families. Interpreters were identified at a ratio of 100:1. Note this staffing could instead be used as an amount to purchase interpretation services. The support model for ELL varied in the smallest school, with only an instructional aide recommended given the small class sizes and limited number of students.

Next, instructional staffing is presented for special education students.

Table 3.7C
Additional Personnel for Mild Special Education Students Identified by Wyoming PJ Panels

Elementary School	48 students (in K-12)	150 students	210 students	300 students
Mild Student Count (9%)	4 students	14 students	19 students	27 students
Teachers	0.2	0.9	1.3	1.8
Paraprofessionals	0.3	0.9	1.3	1.8
Middle School	24 students (in K-12)	150 students	300 students	525 students
Mild Student Count (9%)	2 students	14 students	27 students	47 students
Teachers	0.1	0.1	0.3	0.5
Paraprofessionals	0.2	0.3	0.6	1.1
High School	32 students (in K-12)	200 students	400 students	1,000 students
Mild Student Count (9%)	3 students	18 students	36 students	90 students
Teachers	0.1	0.2	0.5	1.2
Paraprofessionals	0.2	0.4	0.8	2.0

Staffing for mild special education students was recommended at the same levels at elementary, middle, and high schools: 15:1 for teachers and 15:1 for paraprofessionals. Recommendations varied slightly in the smallest school settings.

Table 3.7D
Additional Personnel for Moderate Special Education Students Identified by Wyoming PJ Panels

Elementary School	48 students (in K-12)	150 students	210 students	300 students
Moderate Student Count (3.5%)	2 students	5 students	7 students	11 students
Teachers	0.1	0.4	0.6	0.9
Paraprofessionals	0.2	0.8	1.2	1.8
Middle School	24 students (in K-12)	150 students	300 students	525 students
Moderate Student Count (3.5%)	1 student	5 students	7 students	18 students
Teachers	0.1	0.4	0.6	1.5
Paraprofessionals	0.1	0.8	1.2	3.0
High School	32 students (in K-12)	200 students	400 students	1,000 students
Moderate Student Count (3.5%)	1 student	7 students	14 students	35 students
Teachers	0.1	0.6	1.2	2.9
Paraprofessionals	0.1	0.8	1.2	1.8

To serve moderate special education students, panelists recommended staffing at 12:1 for teachers and 6:1 for paraprofessionals. Recommendations varied slightly in the smallest school settings.

Table 3.7E

Additional Personnel for Severe Special Education Students Identified by Wyoming PJ Panels

Elementary School	48 students (in K-12)	150 students	210 students	300 students
Severe Student Count (1.5%)	1 student	2 students	3 students	5 students
Teachers	0.1	0.7	1.0	1.7
Paraprofessionals	0.3	1.0	1.5	2.5
Middle School	24 students (in K-12)	150 students	300 students	525 students
Severe Student Count (1.5%)	1 student	2 students	5 students	8 students
Teachers	0.1	0.7	1.7	2.7
Paraprofessionals	0.3	1.0	2.5	4.0
High School	32 students (in K-12)	200 students	400 students	1,000 students
Severe Student Count (1.5%)	1 student	3 students	6 students	15 students
Teachers	0.1	1.0	2.0	5.0
Paraprofessionals	0.3	1.5	3.0	7.5

Staffing for severe special education students was identified at a level of 3:1 for teachers and 2:1 for paraprofessionals, again varying slightly for the smallest school settings.

Related service professionals were identified in aggregate at the district level in Table 3.11B.

Table 3.7E

Additional Personnel for CTE Students Identified by Wyoming PJ Panels

High School	9-12 (in K-12), 32 students	9-12, 200 students	9-12, 400 students	9-12, 1,000 students
CTE (100%)	*32 students*	*200 students*	*400 students*	*1,000 students*
Teacher (in base)	*1.0*	*2.0*	*4.0*	*10.0*
Teacher (additional to lower class size)	0.1	0.5	1.0	2.5

Panelists recommended that all middle and high school students participate in CTE classes, at least at an exploratory level, given the emphasis on postsecondary and career readiness in Wyoming. Teachers were identified in the base to provide CTE classes for all students, then additional CTE teachers were identified to lower class sizes in more specialized CTE classes, particularly due to safety concerns of working with some equipment.

Table 3.7F

Additional Personnel for Students in Approved Alternative Programs/Schools Identified by Wyoming PJ Panels

	Very Small	**Small**	**Moderate**	**Large**	**Very Large**
District Enrollment	104 students	500 students	1,200 students	3,025 students	10,700 students
Approved Alternative School/ Program		*25 students*	*50 students*	*100 students*	*150 students*
Teachers		3.0	6.1	12.0	18.2
Paraprofessionals		0.2	0.3	0.7	1.0
Student Support		0.3	0.5	1.0	1.5
Nurses			0.1	0.3	0.4
Principal			0.5	0.7	1.0
Secretary/Clerks			1.0	1.5	2.0

Currently, alternative schools receive different resources in the funding model. Panelists felt that resources should also be provided for approved alternative programs in districts that do not have enough students to require a separate alternative school. A representative program/school size was identified for each representative district with instructional and student support identified for both programs and schools. Then, principal, nurse, and secretarial/clerical staff were recommended for separate schools.

School-Level: Non-Personnel Costs

Aside from personnel needs, Table 3.8A shows additional school-level, non-personnel costs identified at the base level. Table 3.8B identifies the additional non-personnel costs for special needs students.

Table 3.8A

School-Level, Non-Personnel Costs Identified by Wyoming PJ Panels, Base Education

School Enrollment				
Elementary School	48 students	150 students	210 students	300 students
Middle School	24 students	150 students	300 students	525 students
High School	32 students	200 students	400 students	1000 students
Base Education Supplies, Materials & Non-Capital Equipment				
Elementary School	$250/student	$250/student	$250/student	$250/student
Middle School	$300/student	$300/student	$300/student	$300/student
High School	$470/student	$470/student	$470/student	$470/student
Student Activities				
Elementary School	$25/student	$25/student	$25/student	$25/student
Middle School	$1,325/student	$670/student	$465/student	$300/student
High School	$2,160/student	$1,200/student	$965/student	$720/student

School-level, non-personnel cost figures were developed for instructional supplies, materials, and equipment and student activities (field trips, sports, extracurricular activities, etc.), varying by school size and grade level based upon available expenditure data. *Note, collected expenditure figures for supplies and materials have since been refined and updated in the recommendations section.*

Table 3.8B

School-Level, Non-Personnel Costs Identified by Wyoming PJ Panels, Special Needs

Special Needs Supplies, Materials & Non-Capital Equipment				
At-Risk	$50/AR student	$50/AR student	$50/AR student	$50/AR student
ELL	$100/ELL student	$100/ELL student	$100/ELL student	$100/ELL student
Gifted and Talented	$40/GT student	$40/GT student	$40/GT student	$40/GT student
CTE, Middle School	$25/student	$25/student	$25/student	$25/student
CTE, High School	$100/student	$100/student	$100/student	$100/student
Approved Alt. School/ Program	*same as HS*	*same as HS*	*same as HS*	*same as HS*

Panelists recommendations also identified additional non-personnel costs for at-risk, ELL, gifted and talented, and CTE students. Panelists also discussed non-personnel costs for special education, but ultimately an overall non-personnel cost for special education was calculated at the district level using expenditure data reported to WDE. Unless otherwise noted, per student figures apply to all students in a school.

Non-personnel costs for professional development and substitutes were identified at the district level.

School-Level: Additional Programs

Tables 3.9A through 3.9B indicate other programs, such as before- and after-school programs, and summer school programs, the panels felt were needed to support students. Programs are shown at the elementary, middle, and high school level. Preschool, intended to be a program within an existing elementary school, is also identified as a needed program.

It is important to note that the study did not include transportation costs for these programs, as they would be assumed to be reimbursable costs.

Table 3.9A
Elementary Additional Programs Identified by Wyoming PJ Panels

	Preschool	After School	Summer School
Student Population Served	At-Risk four-year-olds	At-Risk	At-Risk
Percentage of Population Served	100%	50%	50%
Program Specifics	Half-day	2 hours, 4 days a week	Half-day, 3 weeks
Personnel	20: 2 (Teacher and Aide); *Additional Staffing at Same Per-Student Level as Elementary*	10: 1 Teachers	10: 1 Teachers
		1 Aide/Clerical	1 Aide/Clerical
		1 Coordinator	1 Administrator
Other Costs	*Same as Elementary School*	$1 a day for snack	$1 a day for snack

While not currently a required funding component of the Wyoming education system, panelists strongly recommended providing preschool for all at-risk four-year-olds. Research has demonstrated improved learning outcomes for students with early interventions, and by providing support prior to entering the K-12 system, costs for interventions could be reduced in the long term. Reducing the number of students identified for special education was also noted as a potential benefit and future costs savings by making the early investment in early childhood education. Extended learning opportunities, such as before- and after-school programs, as well as summer school, were also recommended for at-risk students, based on an expected participation rate of about 50 percent.

Table 3.9B
Middle and High School Additional Programs Identified by Wyoming PJ Panels

Middle and High School Additional Programs		
	Extended Day	**Summer School**
Student Population Served	At-Risk	At-Risk
Percentage of Population Served	50%	50%
Program Specifics	2 hours, 4 days a week	Half-day, 3 weeks
Personnel	15: 1 Teachers	15: 1 Teachers
	1 Coordinator	1 Administrator

As was the case in elementary school, extended learning opportunities, such as before- and after-school programs, as well as summer school, were also recommended for at-risk students at the secondary level. Panelists also discussed alternatives to support students prior to needing summer school (such as through credit recovery programs, Friday/Saturday school, or programming over breaks), but the overall level of resources identified for summer school would allow flexibility on when this type of service was offered.

School-Level: Technology Hardware

Tables 3.10A through 3.10C show the technology needs of each school. Panelists called for an array of technology to be available for students and staff, including technology-rich learning environments in classrooms, including visual presentation systems (smartboards, projectors or TVs, document cameras, audio enhancement) and one-to-one mobile devices for students (primarily Chromebooks, funded at a rate of 1.15 per student to allow for maintenance, damage, loss, or when they are forgotten at home) beginning in kindergarten. At least one computer lab was still recommended given the need for higher-powered machines or dedicated spaces for certain programs and classes.

Table 3.10A
Elementary School Technology Hardware Identified by Wyoming PJ Panels

	Units Needed	
Administration/Main Office		
Computers	1	/office staff member
Laptops	1	/administrator
Copier/Printer	2	total # needed
Cell Phone Stipend	$720	/administrator
Mobile Device	1	/administrator
Faculty		
Laptops	1	/professional
Mobile Device	1	/teacher
Classroom		
Computers	1	/classroom
Visual Presentation System with Audio Enhancement	1	/classroom
Computer Lab(s)- Fixed		
# of fixed labs	1	
Computers	25	/fixed lab
Printers	1	/fixed lab
Visual Presentation System with Audio Enhancement	1	/fixed lab
Media Center		
Computers	3	total # needed
Other		
Student Devices	1.15	/student
Switches/Routers	$25	/student

Table 3.10B
Middle School Technology Hardware Identified by Wyoming PJ Panels

	Units Needed	
Administration/Main Office		
Computers	1	/office staff member
Laptops	1	/administrator
Copier/Printer	1–3	total # needed (based on size)
Cell Phone Stipend	$720	/administrator

	Units Needed	
Mobile Device	1	/administrator
Faculty		
Laptops	1	/professional
Mobile Device	1	/teacher
Classroom		
Computers	1	/classroom
Visual Presentation System with Audio Enhancement	1	/classroom
Computer Lab(s)- Fixed		
# of fixed labs	1	
Computers	25	/fixed lab
Printers	1	/fixed lab
Visual Presentation System with Audio Enhancement	1	/fixed lab
Media Center		
Computers	3–5	total # needed (based on size)
Other		
Student Devices	1.15	/student
Switches/Routers	$25	/student

Table 3.10C
High School Technology Hardware Identified by Wyoming PJ Panels

	Units Needed	
Administration/Main Office		
Computers	1	/office staff member
Laptops	1	/administrator
Copier/Printer	2–4	total # needed
Cell Phone Stipend	$720	/administrator
Mobile Device	1	/administrator
Faculty		
Laptops	1	/professional
Mobile Device	1	/teacher
Classroom		
Computers	1	/classroom
Visual Presentation System with Audio Enhancement	1	/classroom
Computer Lab(s) – Fixed		
# of fixed labs	1–4	(based upon size)
Computers	25	/fixed lab
Printers	1	/fixed lab
Visual Presentation System with Audio Enhancement	1	/fixed lab
Media Center		
Computers	5–12	total # needed (based upon size)
Other		
Student Devices	1.15	/student
Video Cameras	2-10	total # needed (based upon size)
Switches/Routers	$25	/student

District-Level Resources

Panelists also identified the resources needed at the district level to support schools. Table 3.11A shows the personnel and non-personnel resources needed for all students (base education), while Table 3.11B identifies the additional resources needed for special needs students at the district level.

It is important to note that different districts often use different position titles or levels of personnel to fulfill the same functions or roles. For example, one district may have a chief financial officer, while in another district that same function might be filled by a business manager or a director. District functions considered (but not limited to) included:

- **Instructional**: curriculum/data, professional development, oversight of schools, technology, and student services.
- **Operations**: overseeing facilities, security, and food service.[6]
- **Finance**: budgeting, purchasing, accounting, payroll and human resources.

Personnel to fulfill all needed functions are captured in general personnel categories, as shown in Table 3.11A for the five representative district sizes.

Table 3.11A
District Personnel Resources, Base Education Identified by Wyoming PJ Panels

	Very Small	Small	Moderate	Large	Very Large
District Enrollment	104 students	500 students	1,200 students	3,025 students	10,700 students
Base Education Personnel					
Administrators					
Superintendent	1.0	1.0	1.0	1.0	1.0
Assistant Superintendents				1.0	3.0
Directors		0.5	2.0	4.0	12.0
Business Manager	1.0	1.0	1.0	1.0	1.0
Professionals					
Network Administrators	*contracted*	1.0	1.0	1.0	2.0
IT Technicians	*contracted*		1.0	2.0	3.0
Other Professionals				1.5	15.0
Clerical Staff					
Secretaries/Clerks	1.0	1.0	1.0	3.0	9.0
Payroll/AP/AR/Data Specialists	1.0	1.5	3.0	6.0	15.0
Other Costs					
Substitutes	$284/student	$284/student	$284/student	$284/student	$284/student
Professional Development	$187/student	$187/student	$187/student	$187/student	$187/student
District Misc. Other Costs	$1,113/student	$648/student	$483/student	$357/student	$240/student

[6] Note: transportation was excluded as a separate reimbursement model element and groundskeepers/ maintenance/ custodial staff are addressed through separate maintenance and operations calculations based on square footage/acreage.

Staff needed by district size varied from the smallest district that needed a superintendent who performed many of the district's functions with support from a business manager, classified staff, and additional contracted support, to the largest district that needed 17 administrators, 18 professionals, and 25 secretaries/clerks to perform the same district functions. Similarly, other district costs, such as liability insurance, data systems, legal, school board, and audit, varied by district size, with higher dollars per student needed as district size decreased. There was less of a relationship between expenses for substitutes and professional development by size, so an average was used. All other cost figures were based upon actual expenditures over a three-year period.[7]

Table 3.11B

Additional District Resources for Special Needs Students Identified by Wyoming PJ Panels

Enrollment	104 students	500 students	1,200 students	3,025 students	10,700 students
Special Education (14%)	*15 students*	*70 students*	*168 students*	*424 students*	*1,498 students*
At-Risk (38%)	*40 students*	*190 students*	*456 students*	*1,150 students*	*4,066 students*
ELL (3%)	*3 students*	*15 students*	*36 students*	*91 students*	*321 students*
At-Risk Personnel					
Director			0.2	0.4	1.0
Coordinator			0.5	1.0	2.0
Secretary/Clerk			0.5	1.0	2.0
ELL Personnel					
Director				0.2	0.5
Coordinator				0.25	1.0
Secretary/Clerk				0.5	1.0
Special Education Personnel					
Director	0.2	0.5	1.0	1.0	1.0
Supervisor					1.0
Coordinator				1.0	3.0
Secretary/Clerk		1.0	1.0	2.0	6.0
Speech Pathologists	*contracted*	1.3	3.0	5.0	17.8
Additional Therapists (Occupational, Physical, Visual, Audiology, etc)	*contracted*	0.7	1.6	3.0	8.9
Case Managers		0.4	1.0	2.5	8.9
Assistive Technology Specialists		0.5	0.5	1.0	1.0
Psychologists	*contracted*	0.7	1.6	4.0	14.3
Behavior Specialists		0.4	1.0	2.5	8.9
Transition/Job/Community Living Coordinators		1.0	2.0	4.0	4.0
Transition/Job/Community Living Paraprofessionals				4.0	8.0
Special Education Other Costs					
Non-Personnel Other Costs	$1,745/ SE student	$1,745/ SE student	$1,745/ SE student	$1,745/ SE student	$1,745/ SE student

[7] Other costs were calculated using data from 2013-16, using WDE accounting codes and district business manager feedback to ensure costs were inclusive of all costs in an area.

In addition to the teaching and paraprofessional staffing identified to serve special education students, related service professionals were also identified including speech pathologists, other therapists, case managers, assistive technology specialists, psychologists, behavior specialists, and transition/ job/community living coordinators and paraprofessionals. On average, there was about a 1.0 FTE related service professional per 25 special education students. Other non-personnel costs, to address necessary items, such as supplies and materials, and equipment, are also addressed. These costs amount to $1,745 per special education student, on average, using 2016-17 data collected by WDE.

Additionally, districts spent $14.6 million on out-of-district placement for special education students in 2016-17. The study team would recommend that this cost should be separately reimbursable and not part of any funding formula, so it is not included here.

The base PJ figures from the largest district (knowing that a size adjustment would need to be included to address the size-related variances presented here) will be compared to the results of the other adequacy approaches and the current Funding Model in Chapter V.

IV. Modified Successful Schools Approach to Adequacy

The theory behind the successful districts/schools approach is that the resources used at the base level in the highest achieving districts in a state should be representative of the amount of resources all districts will need to successfully educate students with no special needs. Because these districts often have lower than average numbers of students with special needs, this method is not appropriate for determining adequate funding for special needs students, such as students who are from low-income families, ELL students, and students with disabilities. Using the typical successful districts/schools method, the study is conducted at the district level. Districts that are outperforming their peers, measured using both status performance (e.g. the percentage of student scoring at the proficient level or above on state assessments) and growth (the amount of academic gains students achieve over time) are identified. Expenditure data for these districts are then collected for broad categories of expenditures, such as central office administration and operations, school administration, school instruction, and school operations and maintenance. An overall per-pupil amount for these expenditures is calculated, weighted by district enrollment, and the result represents the estimated adequate per-pupil base spending amount.

The study team modified this basic approach in two ways. First, because Wyoming has relatively few school districts, the study team conducted the study at the school level. Second, the purpose of this study in the Wyoming context is not to identify overall per-student funding amounts, but to collect more detailed information about the instructional approaches and resource use of the schools that are "beating the odds," or outperforming other schools in similar contexts with similar student characteristics, and using these findings to inform our review of the current funding model and results of adequacy approaches. For example, the data collected using this approach will be compared to the elements of the current funding model and the recommendations of the PJ study to show how actual high-performing schools compare in terms of class sizes, administrative staffing, or specific interventions for supporting students who are not meeting academic standards. This approach can be thought of as a hybrid between the successful districts/schools approach and case study research.

Identifying Successful Schools

In Wyoming, successful schools were identified based on performance on the state's accountability system over three years (2013-14, 2014-15, and 2015-16). Schools were determined to be successful if they received the designation of "Exceeding Expectations" in two out of three years, and at least "Meeting Expectations" in the other year. Based on these criteria, 56 schools were identified as successful for the purposes of this study. Table 4.1 on the following page identifies this set of schools. It should be noted that not being identified as a successful school through this process does not mean that a school is not doing well with their students or fulfilling state expectations. Instead, the study team was simply selecting schools that are recognized for achieving the highest level of performance in the state.

Table 4.1
Identified Successful Schools

School ID	District	School Name	Grade Span	2016-17 Enrollment
		Elementary Schools		
0101017	Albany #1	Slade Elementary	ES	257
0201001	Big Horn #1	Burlington Elementary	ES	104
0301021	Campbell #1	Paintbrush Elem	ES	379
0301022	Campbell #1	Conestoga Elementary	ES	408
0301024	Campbell #1	Pronghorn Elementary	ES	425
0402003	Carbon #2	Hanna Elementary	ES	79
0701008	Fremont #1	Gannett Peak Elementary	ES	562
0701009	Fremont #1	Baldwin Creek Elementary	ES	300
1101010	Laramie #1	Deming Elementary	ES	115
1101014	Laramie #1	Gilchrist Elementary	ES	104
1101022	Laramie #1	Miller Elementary	ES	84
1101040	Laramie #1	PODER Academy	ES	160
1102001	Laramie #1	Albin Elementary	ES	54
1202003	Lincoln #2	Thayne Elementary	ES	374
1202004	Lincoln #2	Etna Elementary	ES	281
1301003	Natrona #1	Evansville Elementary	ES	276
1301009	Natrona #1	Sagewood Elementary	ES	307
1506004	Park #6	Wapiti Elementary	ES	10
1506005	Park #6	Glenn Livingston Elementary	ES	314
1702002	Sheridan #2	Henry A. Coffeen Elementary	ES	347
1702003	Sheridan #2	Highland Park Elementary	ES	369
1702007	Sheridan #2	Woodland Park Elementary	ES	297
1702009	Sheridan #2	Meadowlark Elementary	ES	340
1702010	Sheridan #2	Sagebrush Elementary	ES	336
1801002	Sublette #1	Pinedale Elementary	ES	498
1809002	Sublette #9	La Barge Elementary	ES	47
1902011	Sweetwater #2	Truman Elementary	ES	312
2001001	Teton #1	Alta Elementary	ES	55
2201002	Washakie #1	South Side Elementary	ES	198
2307001	Weston #7	Upton Elementary	ES	126
		Middle Schools		
0101050	Albany #1	Laramie Junior High School	MS	741
0202050	Big Horn #2	Lovell Middle School	MS	170
0501050	Converse #1	Douglas MS	MS	363
0801051	Goshen #1	Southeast Junior High School	MS	47
0901050	Hot Springs #1	Thermopolis Middle School	MS	197
1001050	Johnson #1	Clear Creek Middle School	MS	251
1701050	Sheridan #1	Big Horn Middle School	MS	92
1702050	Sheridan #2	Sheridan Junior High School	MS	764

School ID	District	School Name	Grade Span	2016-17 Enrollment
1809050	Sublette #9	Big Piney Middle School	MS	135
2001050	Teton #1	Jackson Hole Middle School	MS	630
High Schools				
0201055	Big Horn #1	Burlington High School	HS	68
0801055	Goshen #1	Southeast High School	HS	99
1701055	Sheridan #1	Big Horn High School	HS	146
2001055	Teton #1	Jackson Hole High School	HS	673
K-8 Schools				
0101001	Albany #1	Snowy Range Academy	K-8	197
0101030	Albany #1	UW Laboratory School	K-8	264
0301010	Campbell #1	Little Powder Elementary	K-8	26
0301014	Campbell #1	Recluse School	K-8	23
0601008	Crook #1	Moorcroft K-8	K-8	436
2104020	Uinta #4	Mountain View K-8	K-8	619
K-12 Schools				
0401049	Carbon #1	Little Snake River Valley School	K-12	187
0402049	Carbon #2	Encampment K-12 School	K-12	135
0601049	Crook #1	Hulett School	K-12	137
1001049	Johnson #1	Kaycee School	K-12	147
1516049	Park #16	Meeteetse School	K-12	123
2202049	Washakie #2	Ten Sleep K-12	K-12	114

From within this set, the study team selected a subgroup of 12 schools to conduct more in-depth interviews and qualitative data collection. The subset of schools was selected to include elementary, middle, high, and K-8/K-12 schools, and to be as varied as possible in terms of size, need, and geography. The study team was unfamiliar with all of the schools when the selection was made, so the selection was made without preconceived notions or bias.

- Albin Elementary, Laramie 2
- Big Horn High School, Sheridan 1
- Big Piney Middle School, Sublette 9
- Douglas Middle School, Converse 1
- Evansville Elementary, Natrona 1
- Gilchrist Elementary, Laramie 1
- Glenn Livingston Elementary, Park 6
- Jackson Hole High School, Teton 1
- Meeteetse School, Park 16
- Paintbrush Elementary, Campbell 1
- Snowy Range Academy, Albany 1
- Truman Elementary, Sweetwater 2

Data Collected

The study team was provided staffing and expenditure information from WDE for all 56 successful schools. From this data, the study team was able to identify resource use in areas, such as:

- Average class sizes,
- Elective teacher staffing,
- Instructional and student support staffing,
- Administrative staffing,
- Staff to serve special needs students, and
- Expenditures for instructional materials and student activities.

The study team also developed a case study interview protocol to gather the following key data and insights during each of the school visits:

- Community and student characteristics and their effect on the school.
- Use of time at the school, including the school schedule and how collaborative teacher time and individual teacher planning and preparation time are provided and utilized.
- School curriculum and instruction strategy, including a description of any promising instructional strategies that have been developed.
- Specific interventions used for students who are performing below grade-level expectations, including tutoring, extended learning time strategies, and approaches for providing services to students with disabilities and ELL students.
- Formative and teacher-developed assessments, district-wide assessments, and state assessments administered at the school and how these data are used to inform and modify instruction.
- Professional development opportunities for the school staff, including the form (e.g. workshops, school and classroom based, summer institutes, etc.), topics covered, and amount of investment in professional development.
- Characteristics of the school culture, including teacher collaboration and the degree to which schools are characterized by ongoing discussions of instruction that are oriented to individual student learning ability.

In this report, the study team will first present the key themes from the interviews with the smaller set of schools, then resource allocation information for the full pool of 56 successful schools.

Key Themes from Successful Schools Interviews

In October 2017, APA conducted site visits and interviews with 12 schools in Wyoming identified as successful. The purpose of these visits was to: 1) directly gather expert opinions from school leaders on the most important reasons for their school's success; 2) collect input from teachers or teacher leaders, if possible, on the key contributing factors to their school's success; and 3) view the school facilities and instructional practices in the context of their unique locations and community settings. Each site visit lasted approximately three hours and included in-person meetings with school leaders. In some cases, teachers, school board members, or other school personnel participated in the school leader interviews. In other cases, teachers were interviewed separately through interviews or focus groups.

APA collected the input from these meetings and has attempted to distill common themes from across the schools that provided input. These themes are summarized briefly below. It should be noted that, while the schools APA visited included a mix of elementary, middle, and high schools from different locations and communities across Wyoming, the themes were consistent across sites. In this way, they provide valuable insights for Wyoming's education and policy leaders of what is supporting the success of these schools.

Creating a strong, collaborative culture across teachers: three key pieces

One of the most common features observed across the successful Wyoming schools APA visited was an outstanding culture of collaboration, professionalism, and high standards that teachers and principals shared, both for themselves and their students. This culture was notable in that teachers and principals believe it is essential for teachers to push themselves and their peers to continually improve and to demand from their students both hard work and, as one principal described, an attitude of academic "grit."

APA observed three key, interrelated practices the successful schools utilized to help create such strong cultures of achievement. These include: 1) providing professional development support and coaching (typically led by an experienced teacher serving as a full-time instructional facilitator); 2) creating blocks of common time for teachers to meet, plan, and collaborate together with the support of their instructional facilitator; and 3) ensuring that data plays a central role in all decision making, and that training and regular coaching is provided on the use of formative and summative assessments and the use of resulting data to inform instruction. More detailed descriptions of each of these elements are provided below:

<u>Professional development support and coaching:</u> The high-performing schools in Wyoming placed an emphasis on teacher development through the sharing of ideas and collaboration with the support of an instructional coach. This could take several different forms across the schools APA visited. For instance, one school created "studio days" where, once per quarter, 7–8 teachers would be selected to meet with either the school's instructional coach or an outside consultant. With the support of an instructional coach, these teams identify goals and objectives for themselves and then visit a classroom together to study the instruction taking place, identify strengths and weaknesses, and take away ideas to implement in their own classrooms. Substitute teachers are provided in order for the participating teachers to leave their classrooms to conduct these observations. Teachers and school leaders agree that this program contributed to building a strong, collaborative culture across teachers in the school, and that it is critical to "deprivatizing instruction." In other words, this type of activity is viewed as important for helping teachers to collaborate and to view their own classrooms as open laboratories for exploration, creativity, and constant improvement. Most of the schools APA visited also implemented professional learning communities (PLCs) as part of their weekly routine. High fidelity to such PLCs and high teacher buy-in and input to their design may distinguish PLCs in these schools from those in other locations

around the state. For these schools, PLC time is used for teachers to: meet in grade-level teams to discuss and share their assessment data, diagnose key strengths and learning challenges in their students, develop tailored solutions that meet identified learning challenges, and ensure that no teacher feels isolated in their classroom. Again, an instructional facilitator is typically a key part of the success for these PLCs, as this facilitator moves between teacher teams, provides coaching and support as an experienced educator, and provides a conduit to the school principal if additional training or other classroom resources surface as needs across teacher teams. External trainers are sometimes brought into the schools to provide initial momentum to help motivate staff around constructive design, implementation, and use of PLC time. It should be noted that many of the schools APA visited indicated that recent budget and staffing reductions are forcing these schools to reduce or eliminate instructional facilitator positions and to cut back on the number of professional development days that are provided. Teachers and leaders in these schools believe such reductions negatively impact their ability to maintain high student performance because they degrade the capacity of staff to efficiently use data and decrease common planning time to enhance instruction.

Common planning time and creative scheduling: The successful schools use a variety of approaches to create common time for their teachers to meet and plan together. For instance, schools utilize early-release days or four day weeks (with time on the fifth day available as a day for teacher collaboration) in order to provide common, dedicated time for teachers to collaborate. In addition, schools place a high priority on designing the daily class schedule so that teachers at similar grade levels (at the elementary level) or content areas (at the secondary level) have common off periods, which can be used as collaboration time to plan, share ideas, and utilize data to inform instruction. Again, the establishment of such dedicated time for teachers to plan and collaborate is viewed as critical to building a positive culture of high expectations. To enhance the effectiveness of such collaboration time, the successful schools typically provide coaching or support though an experienced educator in the building who, as a full-time instructional facilitator or coach, is released from regular classroom instructional duties.

Data sharing and analysis: Key to the effective use of common planning time for teachers in the successful Wyoming schools APA visited was an emphasis on sharing and discussing student data. Principals and teachers in these schools consistently indicate that teachers use common planning time, early release days, and other creative scheduling to meet in teams or professional learning communities to discuss and utilize student data to inform instruction. Teachers utilize a mix of formative and summative assessment data to diagnose key challenges for students and to develop tailored solutions. Such solutions can include sending students to different classrooms or teachers where the most appropriate instructional support can be provided. For instance, one school APA visited has created a 25 minute "focus period" each day. Teachers use performance data to identify students who are struggling, and these teachers can then refer students to another teacher in the building to receive extra help and assistance during the focus period. Another school APA interviewed similarly indicated that, in an eight-period day for high school students, they have created a "flex time" period where students who are struggling can receive additional support from another teacher in the specific content area where they need extra help. School and district leaders believe strongly that smaller class sizes are essential to this type of approach, because smaller classes give teachers the capacity to spend the time needed on each of their students to closely study and understand individual assessment data. This is critical for understanding what the data is saying in terms of student comprehension, and for identifying the most appropriate teacher to whom a student should be referred for extra help during a focus or flex period. A focus on the use of data to diagnose student strengths and needs also plays an essential role in the successful schools' ability to tailor overall support for all students, including those who do not struggle academically. For instance, several schools APA interviewed leverage data, along with the school's small overall size, to essentially develop individual learning plans and learning goals for each student in the school. At the secondary level, such individual learning plans, supported by teachers and counselors reliance on individual student data, is used to inform postsecondary education and career planning for students.

Added student support outside regular school time

Every high-performing school that APA visited featured after-school supports for students. Teachers and school leaders pointed to these programs as important in providing added time for struggling students to master academic material. In most schools, the programs consisted of an hour or two of programming after school, four days a week. Programs were usually designed to target students who needed extra help, but other students were often allowed to attend as well. The programs were typically operated by teachers who were paid hourly for their extra time. However, in several cases teachers volunteered their time to support after-school work with students. Teachers and principals interviewed by APA indicate that, in prior years, after-school programs were more robust, with longer hours of operation, more staff, and more focused, grade-level supports. Although funding for the Wyoming Bridges grant was folded into the state's education funding model, recent budget and staffing reductions have caused teachers in some schools to either reduce their positions to part time or to take on other responsibilities in the school that reduce their capacity to participate in after-school instruction.

In addition to after-school programs, several schools operated before-school tutoring and summer school programs. Before-school programs typically operate for one hour, several days each week. The goal of such programs is to provide extra homework or extra one-on-one instructional support to students who are falling behind. Summer school programs consisted of multi-week sessions lasting several hours per day, again with the primary goal of supporting students who are behind academically.

Class Size

Class size ratios varied from 8–25 students per teacher in the schools APA visited. In the cases where schools had higher ratios, principals expressed concern over the impacts that such higher numbers of students has on both teacher instructional capacity and student performance. Teachers expressed concern that higher class sizes would affect their ability to differentiate instruction and to provide more tailored, small group support to students. This loss of ability to differentiate instruction was viewed as having a potentially significant negative impact on student performance. In general, principals were comfortable with the current sizes of their classrooms, but agreed with teachers that the trend towards larger class sizes in response to budget cuts would impact future student performance.

Small class sizes were cited by school leaders as critical to preserving their ability to tailor instruction to each student's needs.

Instructional interventions for struggling students

Currently, each school visited placed an emphasis on providing students with tailored interventions. Several schools used groups of tutors to pull students into small groups based on ability. Tutors were generally certified staff members. In a few instances schools utilized high-performing students in later grades to tutor and create role models for students in earlier grades. Other schools created intervention teams comprised of an intervention specialist, paraprofessional, tutor, and classroom teachers. These teams providing students with high-quality, targeted interventions in groups no larger than seven students. Other schools created blocks within their schedule where teachers could pull certain students back into their classroom for extended teaching periods, or could send students to other classrooms and teachers for additional support. Across all schools, principals prioritized finding ways of providing struggling students with small group or individual attention as well as additional time during the school day or outside regular school hours to receive tailored support. Principals and teachers in the successful schools expressed the view that raising class sizes would raise caseloads for teachers and hinder their ability to provide such tailored support to students.

Schools also prioritized early interventions for students, typically in K through second grade. Several schools employed certified literacy recovery specialists, who targeted support specifically to students in these early grades. Other schools targeted early literacy interventions through small groups led by tutors and paraprofessionals. Still another school used a mix of teachers, paraprofessionals, and trained parent volunteers to provide intensive 30-minute "flooding" periods four days every week. During these periods, intensive support can be provided to students in very small, 2–3 student groups. Most, if not all schools, used response to intervention strategies to provide early interventions for students identified as struggling via the various assessments employed in the schools. The focus is to keep students at grade level academically and to prevent them from being identified for special education services. Some school leaders indicated having success in removing student from IEPs in later grades due to the successful targeting of added resources and staffing to these students in earlier grades.

Supports for special education and ELL students

For special education students, the successful schools focused on delivering instruction in the regular classroom rather than pulling these students out into separate classrooms of their own. Principals at most schools strongly believed in prioritizing "push-in" services over "pull-out" programs. Resource rooms were available if pull-out services were required. With special education reimbursed at 100 percent in Wyoming, most principals indicated that their special education staff and classrooms were well prepared. In most cases, special education students had 1:1 laptop or tablet electronic devices, such as Chromebooks.

ELL population levels varied at the schools visited. Many schools had very few students requiring ELL supports. In schools were ELL populations were low, the school (or in some cases district) employed a paraprofessional or support staff to support the students. At schools with larger ELL populations, ELL classroom teachers offered both push-in and pull-out services supported by ELL teachers. With ELL students there was also an emphasis placed on earlier grades to try and prevent falling behind in later years.

Added support to address student emotional and health needs and family/parent outreach
Many of the principals at the successful schools indicated that one of the key characteristics they look for in a teacher is the ability to build strong relationships with students and parents. These leaders want teachers who not only will work collaboratively with their colleagues but who develop strong relationships and open communications with their students and parents. Several schools, including elementary, middle, and high schools, stated that parent relationships and school culture were the primary reasons behind their success. These schools strive to maintain a culture of high expectations for all students and assure their students that teachers and staff care about them. For example, one middle school begins each day with a home room consisting of one teacher and no more than 13 students. The home room teacher serves as an advocate for each of his or her home room students, ensuring that no students fall through the cracks. Another school employs a family liaison who conducts regular outreach with parents to ensure they are engaged in their child's education.

Yet another school created "Parent Academies" to bring parents, particularly those in low-income areas, into the school as much as possible. The key goal for these academies was for parents to not only feel comfortable coming into the school, but to help them become more actively engaged in their child's education. The school's instructional facilitator led these academies for parents one hour per week during the second and third quarter of each school year and utilized this time to show parents what their children were learning in school and how parents could support this learning at home. A translator and ELL teacher were brought into these academies to help ensure translated materials were available and to support high levels of parent understanding of the materials presented. This school indicated, however, that due to recent budget and staffing reductions the instructional facilitator position was eliminated and the parent academy is not taking place during the current school year. The principal expressed concern over the impact that the loss of this program will have on the school's ability to maintain a strong and active parent presence in the school, which is viewed as a key contributor to the school's overall success.

Many schools rely on full-time counselors to support student social–emotional needs, and view this position as critical to maintaining strong relationships with parents, especially those whose children have specific behavioral or emotional needs that must be addressed. Teachers in these schools credit the counselor for reducing behavior issues so teachers can focus their efforts on instruction, with fewer overall classroom disruptions that can reduce instructional effectiveness. At the secondary level, counselors play an important role in working with students to identify career interests and to help tailor education plans for students to prepare them for postsecondary and workforce success.

Many of the schools have also implemented positive intervention and support (PBIS) and anti-bullying programs to address behavior problems while minimizing suspending or expelling students. One middle school uses LiveSchool to track students' behaviors to provide an early warning when a student's behavior makes a sudden change.

Teacher salaries/benefits

The interviewees at the schools APA visited consistently expressed the belief that teacher salaries were competitive in relation to teacher salaries in neighboring states. However, they also voiced concern that salaries were becoming less competitive in recent years as teachers (and other staff) received either no raises (for example, freezes on salary schedule step increases) or minimal cost-of-living raises. Several of the schools' principals said that an increasing number of teachers were taking jobs in other states or leaving teaching altogether. Others described how the number of applicants for open positions has declined in recent years. As one successful school leader stated, "the key to the success of schools is the talent of the staff, and the ability to attract and retain master teachers. And salary is the single largest determinant of whether successful schools in Wyoming can find and keep such teachers."

Marginal salary differences are not sufficient to attract top teachers to Wyoming from surrounding states, according to several of the leaders interviewed by APA. In particular, these leaders say salaries not only need to be significantly higher than the average salary of teachers in surrounding states, but in order to attract the very top teachers, Wyoming district salaries need to be significantly higher than those *in the highest-performing school districts* in other states. Such high-performing districts in other states, including for instance those in Denver, Colorado or Lincoln, Nebraska, often pay their teachers higher salaries than their state averages, according to the leaders interviewed by APA.

In general, during the three-year performance period, which was used to identify the high-performing schools for this work, school leaders indicated they were able to fill teacher positions with highly qualified applicants. However, principals across the state mentioned that applicant pools are shrinking and that these pools feature less highly qualified or less experienced candidates. In general, principals in the successful schools are currently able to retain their top teachers. As highly successful schools, teaching positions at these locations continue to be very sought-after jobs within the district. However many indicated that, as salary increases are frozen and district average salaries are reduced, they believe they will start to see many of their best veteran teachers retire and their most promising younger teachers move to other states. This, they indicated, will jeopardize their ability to maintain the high-performing cultures in their schools that produce high student and teacher performance. Some principals have begun to see some cases in their schools where teachers leave to take positions in other districts that offer higher pay or potentially greater job security with a lower threat of staffing cuts.

Overall, principals believe they are in continuous competition for qualified teachers, not only with other Wyoming districts but with districts in surrounding states. These leaders stress that one of their most effective tools for attracting and retaining these teachers is to offer higher salaries and competitive benefits packages. This was especially true for smaller, rural districts that can have trouble attracting and keeping younger teachers. School leaders also expressed concern that uncertainty around the state's level of funding support for education was entering into teachers' decisions to leave teaching in Wyoming, especially among younger teachers with less seniority. Uncertainty around school funding may be discouraging young teachers from applying for open positions in Wyoming, according to these leaders.

Technology
The quality and amount of instructional technology available within the schools varied. A number of schools provided one-to-one devices for most or all classes, typically consisting of tablets, such as Chromebooks or iPads. All of the schools had one or more mobile carts with laptops or tablets, fixed computer labs, or both. Each school interviewed also provided computers to their teachers. In some cases, these consisted of desktops located in their classrooms or laptops, which could be taken home. In a few of the schools teachers had both. Nearly all of the schools had Smartboards in most, if not all, classrooms.

Several schools noted that they had an insufficient number of computers for student use in the classroom, some providing fewer than 10 computers or tablets for a typical classroom. Several of these same schools said they tend to get their district's "hand-me-downs," the older computers replaced by new machines at the central office or in other schools. These older computers tended to be slow, unreliable, in bad repair, and in some cases insufficiently powerful to run some of the latest software. One school said many of its classroom computers were missing keys from their keyboards.

Many of the schools noted that most technology decisions related to the type of hardware and software, as well as the quantity of technology provided to schools, were controlled by the district's central office.

Leaders in a number of the schools APA interviewed, however, believe that technology plays a critical role in their success. In particular, where schools utilize one-to-one devices for students, technology provides teachers with nearly instant access to data regarding student understanding of academic material. For instance, one school interviewed by APA utilizes one-to-one technology to enable teachers to conduct mini-assessments each day where students answer 2–5 questions on specific material that was learned that day. Data entered into student tablets is instantly available for the teacher to analyze and to plan appropriate interventions and supports for students that need extra assistance during grade-level team meetings or PLC time.

Resource Use in Successful Schools

In addition to capturing these broad themes of programs, practices, and services provided in a subset of the successful schools, the study team also used 2016-17 data collected by WDE to examine resource use for the full pool of 56 successful schools in areas, including key staffing and expenditure areas.

Tables 4.2–4.6 provide average staffing and expenditure information. Note that in many places resource use varied widely, often due to size of school. Averages are presented as well as additional detail on size-related variations where relevant.

Table 4.2

Core and Elective Teachers in Successful Schools, 2016-17

Core and Elective Teachers	
Overall Teacher Staffing, including Core and Elective Teachers	*Across all grades, an average student to teacher ratio of 16:1 once elective teachers are included.*
Full-Day Kindergarten	Full-day kindergarten provided.
Elementary Core Teachers/ Class Size	**Elementary Schools:** Average class size overall was 17.1 for schools ranging from 10 to 560 students. For elementary schools at or above 288 ADM, the average class size was 18.4.
Secondary Core Teachers/ Class Size	**Secondary Schools:** Average class size overall was 19.3 for middle and high schools between 47 and 765 students. For middle and high schools over 300 students, the average class size was 21.3.
Elective/Specialist Teachers	**Elementary Schools:** On average, specials are staffed at about 16% of core teachers
	Middle Schools: On average, specials/electives are staffed at about 38% of core teachers
	High Schools: On average, specials/electives are staffed at about 51% of core teachers. *Note, only one high school was over 150 students, so variation is likely due to size and minimum staffing.*
Minimum Teachers **and Staff Resources**	For elementary schools of less than 100, on average 1.0 teacher per grade. Only two **middles and high schools less than 100, so no average minimums reported. For K-12 schools, about 16 teachers total (11 core, 5 elective).**

Key highlights for teacher staffing included class size and elective staffing. For all successful schools regardless of size, the average class size was 17.2 at the elementary level and 19.3 at the secondary level. Looking at larger schools within each grouping (more similar to the larger prototype EB schools or larger representative schools in the PJ approach) increased class sizes to 18.4 at elementary and 21.3 at secondary. Elective staffing ranged from 16 percent of core at the elementary level up to 51 percent of core at the high school level.

Table 4.3

Instructional and Student Support Staffing in Successful Schools, 2016-17

Instructional and Student Support	
Instructional Facilitators/ Coaches	Most successful schools had instructional facilitators at 1.0 per 360 ADM.
Tutors/Tier 2 Interventionists	**Elementary:** one third had a tutor position at 1.0 per 230 ADM on average. **Middle and High School:** only 4 schools had a tutor position with a high variation in staffing ratio. *Interviews suggested this is an area that schools have made cuts, but felt the positions were valuable.*
Student Support Staff	**Elementary:** Not every school had a student support position less than 288 ADM. Above that threshold, most had counselors at a ratio of 380:1. **Middle:** all schools had student support staffed on average at 250:1. **High Schools:** all schools had student support staff at an average ratio of 170:1.
Nurses	On average, successful schools had a 0.5 nurse, with larger schools more likely to have a 1.0 nurse. *Note, this may include nurses for special education.*
Supervisory and Instructional Aides	**Instructional Aides:** On average, 1.0 FTE per 175 Elementary ADM and 1.0 FTE per 350 middle school ADM. Aides were staffed in half of the successful high schools, at a similar ratio to middle school. Most schools did not have supervisory aides.
Librarians and Librarian Media Technicians	**Librarian: Elementary:** about 50% successful schools did not have certified librarian, 30% had a full-time librarian, and 35% had a partial librarian FTE (0.3 on average). **Middle and High School**: about 25% had a full-time librarian, 50% had a partial librarian FTE (0.3 on average), and 35% did not have a certified librarian. All schools over 300 ADM had a combined 1.0 FTE position between the librarian FTE noted, and library/media aides. Below 300 ADM, most schools had a partial library/media aide if they did not have a librarian, or had a combination of the two.

Most successful schools also had instructional facilitators at a ratio of 1.0 per 360 ADM on average, a half-time nurse or more, and instructional aides in elementary and middle schools. Student support varied by grade-band level, with all secondary schools having counselors (at 250:1 in middle school and 170:1 in high school on average) and larger elementary schools being more likely to have a counselor (380:1 on average). Librarian and interventionist staff use also varied.

Table 4.4

Administrative and Clerical Staffing in Successful Schools, 2016-17

Administration and Clerical Staff	
Principals and Assistant Principals	Across grade configurations, schools with less than 125 students had a partial principal position (ranging from a 0.2 to a 0.9, with a 0.5 FTE average). Middle and High Schools over 315 ADM had an assistant principal.
School Secretarial/ Clerical Staff	Clerical staff at 1.0 FTE per 250 for schools over 300 (1.0 FTE per 175 ADM overall).

Schools with less than 125 students had partial principal FTEs, while schools over that threshold had a full-time principal. Large middle and high schools also had an assistant principal. Clerical staff was resourced at 1.0 FTE per 175 ADM on average.

Table 4.5

Resource for Special Needs Staffing in Successful Schools, 2016-17

Resources for Special Needs	
At-Risk	Tutors and student support noted above, but difficult to disaggregate into at-risk vs. base. Most successful schools interviewed offered extended learning opportunities before or after school and during the summer to support struggling students.
English Language Learners (ELLs)	About half of the successful schools had an ELL population, and of schools that did, a third did not provide ELL staffing. Another third provided ELL teachers, staffed on average at 1.0 FTE per 20 ELL students, and another third of schools with an ELL population provided 1.0 FTE ELL aide per every 30 students on average.
Special Education	Interviewed schools also indicated how important the 100% reimbursement model was to serving their students. Current staffing on average in successful schools was 1.0 special education teacher per 16 special education students, 1.0 instructional aide per 8 special education students, and 1.0 related service professional per 27 special education students.
Gifted and Talented Students	Elementary: 25% had a partial FTE (0.2 on average), and 10% had a 1.0 FTE (all 3 schools over 350). Two middle schools and one K-12 also had a partial GT teacher FTE. All remaining schools did not have an identified GT teacher.

As noted, the successful schools approach is often not used to identify resources for special needs students, as the highest performing places might not have large populations of these students and it is often difficult to fully disaggregate resources being used for all students, versus resources targeted for struggling students, unless specifically noted (such as related to Title I or Special Education). However, the table above does present some limited information about resource use for these students. For at-risk students, these successful schools broadly had student support and some also used tutors/interventionists, as described in the prior Table 5.2. Interviews also suggested that extended learning opportunities were provided, but resource allocation information in this area was not specifically found.

The successful schools figures will be compared to the results of the other adequacy approaches and the current Funding Model in Chapter V.

V. Reconciliation of Study Results to Provide Recommendations

In this chapter, the study team will first reconcile the findings related to school and district model resources (personnel, non-personnel costs, and supports and services for special needs students) from the professional judgment approach and successful schools approach, with the results of the 2015 evidence-based (EB) study and current legislative funding model. The study team believes each of the three adequacy approaches provide valid, cost-based estimates on the resources needed to provide the basket of educational goods and services in Wyoming. Given that each approach is defensible, the data points from each were used to triangulate a single reconciled set of recommendations. The study team's recommendations are based on providing resources in an effective and efficient manner within the range of findings from the three cost-based adequacy approaches.

While the study team is presenting specific school and district resource recommendations in this chapter, these recommendations are used as a means of determining the adequate level of resources needed and are not a prescriptive model for implementation. The study team encourages flexibility for schools and districts to determine how best to employ resources to their serve students by the state continuing to provide resources through a block grant. Further, specific based resources noted represent the base, or floor, amount needed- not in total, but on a per student basis- which are then adjusted as school size decreases to ensure that every school can meet the needs of its students, regardless of its size.

This chapter also includes recommendations related to the model parameters (teacher salaries, as well as regional and external cost adjustments) and the current reimbursement components related to special education and transportation from the additional studies and analysis conducted, each presented as a separate supplemental report.

Recommendations by model element are presented below.

Key Recommendations

Increase Model Teacher Salaries

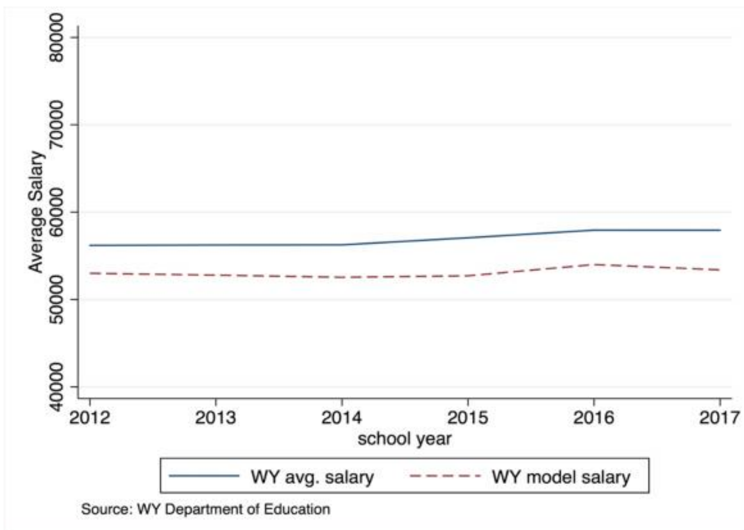
The study team recommends that the state adjust model teacher salaries to reflect actual average teacher salaries paid in Wyoming districts.

The results of the study team analysis of teacher salaries are consistent with prior estimates, and indicate that teacher salaries in Wyoming are higher than teacher salaries in neighboring states. However, the advantage over other regions is beginning to shrink. Since 2013, teacher salaries have lost ground in Wyoming relative to other full-time, employed college graduates. This is largely because teacher salaries have remained relatively flat, while other Wyoming workers' salaries have increased significantly since 2010. After adjusting for inflation and rising wages in non-teaching jobs, teacher salaries in Wyoming have fallen by up to 13 percent since 2012.

Further, the degree to which districts pay teachers above the model salary suggests that they believe the model salary is insufficient to attract and retain high-quality teachers. While the study team cannot expressly rule that out, the current data does not suggest Wyoming has a big problem with teacher attrition and there is no evidence of substantial movement across districts within the state. However, this could be the result of high salaries being paid by districts, and the study team cannot know for certain what it would look like if districts were paying at the model salary level.

Districts typically pay above the model salaries determined by the state by an average of roughly $3,900 annually, but there has been relatively little change in model salaries or received salaries over the period 2011-12 to 2016-17.

Figure 5.1
Wyoming Teacher Salaries over Time: Actual and Model Salaries



Within Wyoming, there is a fairly wide range of average salaries across districts and regions. Teachers in the districts with the highest teacher salaries can expect to be paid roughly $18,000 more, on average, than teachers in districts with the lowest average salaries. These differences translate to modest regional differences in average salary. Average salaries in the southwest region of Wyoming, the highest paying region in the state, are approximately five percent higher than in the central region, the lowest paying region.

Analysis of teacher departure rates by district and region revealed no discernible pattern to suggest differences in salaries explained meaningful differences in departure rates. Departure rates from the profession vary widely across districts, and vary substantially within districts across years. There is no discernible correlation between departure rates and salary levels, either measured as model salaries or payments districts make above model salary rates.

The study team was unable to examine teacher benefits in this analysis, but economic research suggests employees often do not factor benefits into their compensation, and so an analysis with benefits would be unlikely to show substantially different results in terms of the relationship between overall compensation and turnover or attrition.

The study team recommends increasing the average funding model teacher salary by $3,900 to bring funding model salary levels back in line with the actual salaries paid by districts across the state and to pace with the rate of growth of non-teaching salaries in the region. This should allow Wyoming to maintain its advantage over its neighbors in terms of the relative attractiveness of teacher salaries. The resulting average teacher salary recommended is $54,442. This recommended salary includes 5 additional days for professional development.

Given the study team's analysis was focused on teacher salaries for this recalibration study, it is limiting its recommendation to adjusting teacher salaries at this time. In the future, the relationship between model salaries and actual salaries for other personnel positions should also be considered to determine if further model salary adjustments are needed.

The full study on teacher salaries is included in Supplemental Report C.

Adjust Funding Model Class Sizes

For core staffing, the study team recommends adjusting the base class sizes that generate teaching FTEs to 18:1 for elementary grades and 23:1 for secondary grades, which are higher ratios than currently funded in the model (16:1 in K through fifth grade, 21:1 in sixth through 12th grades).

In its draft recommendations, the study team initially recommended 16:1 K-3, and 23:1 in grades 4-12, which would have resulted in an average of 18.3 for a K-5 elementary school. The study team has simplified its recommendation to 18:1 for all elementary grades (including 6th grade if in a K-6 school) and 23:1 for all secondary grades. This still allows for 16:1 class sizes in the lowest grades, and could allow for class sizes of 22:1 for grades 4-5 in a K-5.

Further, by base class sizes, the study team means class sizes in larger schools in the state. The study team recognizes that these class sizes would need to be lower in smaller schools and is also proposing a size adjustment that would capture the diseconomies of scale of smaller settings, including such smaller class sizes. This size adjustment will be addressed in a subsequent section.

These increases to the base class sizes in the funding model are recommended for a number of reasons:

1. Recommended teacher staffing ratios are supported by equally valid adequacy methodologies.
2. Recommended teacher staffing ratios are supported by available research. However, the study team acknowledges that research findings at the secondary level are limited.
3. Recommended teacher staffing ratios are within the range of high-performing benchmark states.
4. Districts are currently staffing schools with fewer teacher FTEs than allocated in the model so that they can pay higher staff salaries. Therefore, adjusting model staffing ratios would better align the model with current district practice.

Further detail is provided below on each of these reasons.

Additionally, it should be noted that the study team recommends additional staffing at the high school level for CTE teachers at a ratio of 1.0 FTE per 400 high school students to offer robust CTE offerings (including computer science) to all high school students. This additional staffing would lower the overall student-to-teacher staffing ratios in high schools.

1. Recommended teacher staffing ratios are supported by equally valid adequacy methodologies.

Overall, the study team believes the adequacy methodologies implemented in Wyoming provide equally valid data points for consideration, and since each is similar to national adequacy study results, the study team recommends elementary and secondary ratios within the range of the three approaches. While trying to be efficient with resources, the study team did not recommend implementing the highest adequacy recommendation of 25:1 (EB approach) because, while valid, it was very different than the current district practice (explained in greater detail below) and stakeholder feedback suggested there were facility limitations that would inhibit their ability to have classes that large.

Table 5.1 that follows presents the comparison of the adequacy approach results and recommendations.

Table 5.1
Core Teachers

Source	Elementary Schools	Secondary Schools
Current Legislative Model	Grades K-5/6: 16	Grades 6-12: 21
2015 Evidence-Based	Grades K-3: 15; 4-5: 25. Average class size of 18.3	Grades 6-12: 25
Professional Judgment	Grades K-2: 16; 3: 18; 4-5: 22. Average class size of 18.3	Grades 6-8: 23; Grades 9-12: 22:1
Successful Schools	Elementary Schools: Average class size overall was 17.1 for schools ranging from 10 to 560 students. For elementary schools at or above 288 ADM, the average class size was 18.4.	Secondary Schools: Average class size overall was 19.3 for middle and high schools between 47 and 765 students. For middle and high schools over 300 students, average class size was 21.3.
APA Recommendation	**18:1 for all elementary grades** (allows for 16:1 in grades K-3, 22:1 in grades 4-5, for an average of 18.3 in a K-5 and 19:1 for a K-6)	**Grades 6-12: 23**

The 2015 EB recommendations and PJ recommendations were both to adjust class sizes to 18.3 on average in the elementary grades, with similar results in the successful schools study. Among the three approaches in Wyoming, results for secondary class size ratios were more varied, from a high ratio of 25:1 for the 2015 EB recommendations, to a low ratio of 21:1 from the successful schools data, with the PJ recommendation in the middle at 22:1 or 23:1, depending on the secondary grade.

This range is similar to national adequacy study findings as presented in the following table.

Table 5.2

Comparison of Core Class Size Recommendations

Study	Elementary K-3	Elementary 4-5	Average Elementary K-5	Middle	High
Wyoming Legislative Model	16	16	16	21	21
North Dakota 2008 and 2014 EB	15	25	20	25	25
Colorado 2006 PJ[8]	16	16	16	22	18
Colorado 2013 PJ[10]	18	18	18	23	30
Montana 2007 PJ[10]	16	16	16	16	16
Nevada 2006 PJ[10]	17	17	17	25	26
South Dakota 2006 PJ[10]	18	18	18	23	24
Average of All Studies	16	21	18	23	23
Median of All Studies	16	19	17	24	25
Mode of All Studies	15	25	20	25	25

Nationally, adequacy-based recommendations were 18:1 on average for elementary, and 23:1 on average for secondary, the same as the study team's recommendations for Wyoming.

2. Recommended teacher staffing ratios are supported by available research. However, the study team acknowledges that findings at the secondary level are limited.

The landmark elementary class size study was the 1985 Tennessee-initiated Project Student Teacher Achievement Ratio (Project STAR), which studied the effects of smaller class sizes on student achievement through a randomized control trial in kindergarten through third grade. This methodology is the research gold standard and continues to provide the basis for studies of class size. Studies based on Project STAR report that small classes (13–17 students) produce statistically significant effects on student achievement across all tested subject areas in kindergarten through third grade, when compared to students in larger classes (22–25 students) (Grissmer, 1999) (Finn & Achilles, Tennessee's Class Size Study: Findings, Implications, Misconceptions, 1999) (Konstantopoulos & Chung, 2009). A number of studies report even larger academic effects for minority students, lower-income students, and low-achieving students (Krueger, 1999) (Konstantopoulos & Chung, 2009) (Krueger & Whitmore, 2001) (Krueger & Whitmore, 2002) (Dynarski, Hyman, & Schanzenbach, 2011). Student achievement gains were largest for students who were in small classes for the longest duration (Finn, 2002) (Konstantopoulos & Chung, 2009) (Krueger, 1999). Enrollment in small classes in kindergarten through third grade also affected student outcomes beyond the early elementary years. Some studies document that achievement gains that persist through seventh or eighth grades (Krueger & Whitmore, 2001) (Krueger & Whitmore, 2002) (Finn & Achilles, 1999) (Grissmer, 1999) (Konstantopoulos & Chung, 2009). Finally, based on Project STAR, researchers report that smaller classes increase the likelihood of high school graduation, ACT/SAT participation, college attendance (by up to 11 percent), college degree

[8] Note, in initial presentation on findings to Select Committee, electives teachers were counted in these figures. To make them more comparable, elective teachers were removed which resulted in large class sizes than originally shown.

attainment, the probability of majoring in a higher-earning field, earnings at age 27, and the amount students save for retirement (Dynarski, Hyman, & Schanzenbach, 2011) (Chetty, et al., 2010) (Krueger, 1999) (Finn, Gerber, & Boyd-Zaharias, 2005).

Compared to the research on class size in the early elementary grades, there is a smaller body of research on class size and student-to-teacher ratios in middle and high school. Nonetheless, there are studies that indicate lower class sizes may be associated with positive outcomes for students at all grade levels. Non-causal correlational studies have identified positive relationships between smaller class sizes in middle and high school and student outcomes on state assessments, and the National Association of Educational Progress (NAEP) (Frederickson, Ockert, & Oosterbeek, 2013) (U.S. Department of Education. National Center for Education Statistics, 2000). A quasi-experimental study using nationally representative data on eighth grade students found that class size reductions "improve some non-cognitive skills related to student engagement" and "may be cost effective particularly when targeted in urban schools (Dee & West, 2011)." In fact, one large-scale study concluded that the positive relationship between small classes and student achievement was stronger for secondary schools than elementary schools (U.S. Department of Education. National Center for Education Statistics, 2000). A multi-level regression analysis conducted in England reported that the effects of class size on student attainment outcomes extended into secondary schools, and observations indicated that lower class sizes were related to better student–teacher interactions and classroom engagement (Blatchford, Bassett, & Brown, 2011). A California policy limited class sizes to 25 in for fourth through 12th grades in schools with large at-risk student populations, and research found that these schools were subsequently more successful in meeting learning outcome goals (Malloy & Nee, 2010).

3. Recommended teacher staffing ratios are within the range of high-performing benchmark states.

Looking at other states using 2014-15 NCES data, Wyoming is currently ranked sixth in terms of overall teacher-to-student ratios[9] (which are correlated with class size[10]) based on actual teacher staffing in Wyoming, which is higher than the current funding model. Two of the high-performing states, Vermont and New Jersey, had smaller student-to-teacher ratios, while Massachusetts, New Hampshire, Virginia, and Maryland had larger student-to -teacher ratios. If the study team's recommendations were implemented (which would be about an additional student per teacher if averaged across all grades), Wyoming would still rank in the top 10 for class sizes, in line with Massachusetts, and still above two of the other high-performing benchmark states.

[9] NECES student-to-teacher ratios include all teaching staff. According to that data, Wyoming's student-to-teacher ratio is 12.4, with the national average being 16.1.

[10] Average class size information is not regularly collected for each state. The most recent data available is from the NCES 2011 School and Staffing Survey, which uses 2007-08 data. So in absence of recent data, the study team made a comparison of overall teacher-to-student ratios, which are highly correlated with class size.

4. Districts are currently staffing schools with fewer teacher FTEs than allocated in the model so they can pay higher staff salaries.

As addressed in the salary study for teachers, districts currently pay $3,900 more on average than the model funds. In speaking with district representatives, this is done so they can attract and retain the best teachers; a factor they believe contributes to their success with students. According to the 2016 CREWR report, districts currently staff nearly 700 teachers fewer than allocated in the model. As a result, the class size ratio used in the funding model to generate teacher FTEs is not reflective of current Wyoming staffing. The study team's recommendation to adjust the FTE funding ratio is in agreement with a recommendation to adjust salaries to more accurately reflect what districts are currently paying staff. As such, this recommendation reflects a "true up" of the legislative model and actual district practice.

An important caveat to the study team's recommendations to change class sizes is that salaries within the model need to be adjusted to more accurately reflect what districts are actually paying. If salaries are not adjusted, any change to class sizes would ultimately result in larger class sizes than recommended and likely push class sizes outside the bounds of current research best practices and adequacy findings.

Additional Funding for At-risk and ELL students

The study team recommends increasing funding for at-risk and ELL students through weights to provide needed supports and services.

Funding for at-risk and ELL students were two areas that appeared to be underfunded in the Wyoming model compared to national recommendations, and findings from the EB and PJ approach both identified the need for increased supports and services for these students.

At-Risk

Table 5.3 on the following page presents the results of the alternative adequacy approaches, the current model, and the study team's recommendation for at-risk students.

Table 5.3
At-Risk Staffing

Source	Tutors	Pupil Support Staff	Extended Day/Year
Current Legislative Model	Provide 1.0 tutor position for every 100 at-risk students. Not provided for small or alternative schools.	Provide 1.0 at-risk pupil support position for every 100 at-risk students. Not provided for small or alternative.	For both extended-day and summer school programs, funding is provided outside of block grant and as a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students. Not provided for small or alternative schools. A minimum 0.50 FTE is provided for school districts that do not generate that amount based on the district's at-risk count.

Source	Tutors	Pupil Support Staff	Extended Day/Year
2015 Evidence-Based	Provide 1.0 tutor position for every 125 at-risk students.	Provide 1.0 at-risk pupil support position for every 125 at-risk students.	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.
Professional Judgment	Panelists identified the following resources: <u>Elementary</u>: tutors/interventionists at 1.0 FTE per 80 at-risk students, 1.0 FTE instructional aide per 40 at-risk students. <u>Middle</u>: tutors/interventionists at 1.0 FTE per 60 at-risk students, 1.0 FTE instructional aide per 50 at-risk students. <u>High school</u>: tutors/interventionists at 1.0 FTE per 50 at-risk students. For supplies and materials, $100 per at-risk student.	Panelists identified the following resources: <u>Elementary</u>: 1.0 FTE student support position for every 225 students. <u>Middle</u>: 1.0 FTE student support position and 1.0 FTE family liaison for every 225 students <u>High school</u>: 1.0 FTE student support position and 1.0 FTE family liaison for every 300 students.	For all grades, extended day and extended year to 50% of at-risk students at a teacher ratio of 10:1 at elementary grades and 15:1 at secondary grades
Successful Schools	Tutors noted above, but difficult to disaggregate into at-risk vs. base. One school staffed an additional 1.0 FTE per 70 at-risk students (Title school).	Counselors noted above, who were cited as critical to success. Additional Title I teachers at about 1.0 FTE per 100 at-risk students in qualifying schools.	Most successful schools interviewed offered extended learning opportunities before or after school to support struggling students.
APA Recommendation	**Provide a 0.30 weight for every at-risk student to provide interventionists, student support, and extended learning opportunities.** *This weight would be applied to total RCA adjusted, base cost figure for a school, multiplied by the number of at-risk students in the school.*		

The study team recommends providing a 0.30 weight for every at-risk student to provide tutors/ interventionists, student support, and extended learning opportunities based upon the PJ approach results. This weight is within the range of national adequacy recommendations (as shown in the table below) and is sufficient to provide the supports and services recommended by best practice research. The at-risk weight would be applied to the total RCA-adjusted, base personnel cost figure for a school, multiplied by the number of at-risk students in the school. For example, if an RCA-adjusted, base cost figure was $10,000 for a school, then each at-risk student would receive an additional $3,000 for supports and services.

Table 5.4
Comparison of Recommendations for At-Risk Weight in Other Adequacy Studies

Study	Weight
Wyoming Legislative Model	0.23[11]
Colorado 2006 PJ[12]	0.37
Colorado 2013 PJ	0.31
Montana 2007 PJ	0.50
Nevada 2006 PJ	0.29
South Dakota 2006 PJ	0.69
Average of All Studies	0.35
Median of All Studies	0.30
Mode of All Studies	0.26

The recommended weight of 0.30 is the median weight seen in other studies nationally. Research on the evidence-based practices supported by the weight is detailed below.

Tutors: One of the most effective ways to improve the performance of struggling students is through the use of intensive and regular tutoring (Wasik & Slavin, 1993) (Shanahan, 1998). However, most of the research indicates that tutoring from a highly trained adult is the most effective model for long-term learning gains (Gordan, 2009). Teacher tutors have the advantage of subject matter and pedagogical expertise and can more easily integrate current classroom subject matter into tutoring (Wasik & Slavin, 1993).

The research focuses primarily on tutoring for reading at the elementary school level because delayed reading impairs the acquisition of many other skills (Torgeson, 2004). Even at the elementary level, tutoring interventions may include a wide range of tutoring hours ranging from 35 to 340 and a wide range of student-to-tutor ratios ranging from one-on-one to a class divided into smaller groups (Torgeson, 2004). In one meta-analysis, the researcher found all of these variations to be effective in improving reading performance (Torgeson, 2004). Other studies indicate that reducing instructional group size is beneficial for improving performance (Elbaum, Vaughn, Hughes, & Moody, 1999). Frequent and regular (at least several times per week for 20–45 minutes) tutoring sessions are the most likely to improve reading performance in elementary school students (May, et al., 2013) (Torgeson, 2004), although there is little agreement on the minimum number of total hours of tutoring necessary to improve student outcomes (Lauer, et al., 2006) (Rothman & Henderson, 2011).

There is less research at the middle and high school level, but the existing research is persuasive. A middle school study found that struggling students who received school-based tutoring from a teacher

[11] Imputed weights for at-risk and ELL students in Wyoming were calculated by dividing the statewide average per pupil at-risk resources (ELL teachers, tutors, pupil support, summer school/extended day, and alternative school resources) divided by the statewide average per pupil base amount consisting of central office resources less special education, transportation and other reimbursable resources plus school level resources less resources for at-risk students. Imputed weight based upon allocated resources.

performed higher on math and language arts assessments (Rothman & Henderson, 2011). A meta-analysis on the tutoring of adolescents found large effect sizes for adult tutors, particularly on student reading and literacy skills (Seung, Ramirez, & Cumming, 2010). Effect sizes were larger when students received more hours of tutoring (Seung, Ramirez, & Cumming, 2010). Finally, a randomized control trial at the high school level found that two-on-one tutoring for one hour every day for disadvantaged students increased math grades, math assessment scores, and expected graduation rates in comparison to a group that did not participate in the tutoring (Cook, et al., 2014).

Student Support: There is a large body of literature documenting the positive effects of school counseling on students in elementary, middle, and high school. Researchers have found higher proficiency rates in ELA and math in schools with comprehensive counseling programs (Wilkerson, Perusse, & Hughes, 2013). Beyond academic achievement, studies link lower student-to-counselor ratios to fewer disciplinary incidents, less misbehavior, reduced suspension rates, higher attendance rates, and greater reported connections to school (Lapan, Gysbers, Bragg, & Pierce, 2012) (Dimmitt & Wilkerson, 2012) (Carrell & Hoekstra, 2014).

Extended learning opportunities: Extended day programs are a relatively popular innovation in school reform. The Education Commission of the States found that 50 state-level, extended-day pilot programs occurred between 2000 and 2008 (Gewertz, 2008). One of the advantages of extended day programs is that they provide more time-intensive student supports that may also impact student achievement. A study of New York City schools concluded that adding 300 more hours than the typical school calendar was one of the strongest predictors of high achievement, along with tutoring and consistent teacher feedback (Dobbie & Fryer Jr., 2011). A host of other studies also indicate that extending learning time predicts gains in math and ELA achievement (Dobbie & Fryer Jr., 2011, Hoxby & Murarka, 2009, Massachusetts 2020, 2009, Coates, 2003, Vandell, Reisner, & Pierce, 2007). A correlational study in California found the length of school day and total school hours per week to be positively associated with school-level achievement scores, particularly for students at schools with a high percentage of students from low socioeconomic levels (Wheeler, 1987). The research on extended learning and non-academic outcomes indicates that after-school programs help to increase extracurricular participation, improve self-confidence, and reduce both disciplinary problems and risky behavior (Bishop, Worner, & Weber, 1988, LeCroy, 2003, Goldschmidt, Huang, & Chinen, 2007, Durlak & Weissberg, 2007, Philliber, Kaye, Herrling, & West, 2002). The research indicates that extended day may be particularly helpful for at-risk students (McDonald, Ross, Abney, & Zoblotsky, 2008, Ross, McDonald, Alberg, & McSparrin-Gallagher, 2007,Lauer, Akiba, Wilkerson, Apthorp, Snow, & Martin-Glenn, 2006).

Extended school years may also be implemented to increase cumulative annual instructional time (Farbman & Kaplan, 2005). Both of these extended learning practices may be implemented alongside other school reform efforts, which are also likely to have an impact on performance (Patall, Cooper, & Allen, 2010) (Farbman & Kaplan, 2005). Thus, the effects of these interventions may be confounded.

ELL

While feedback was generally positive regarding the current funding model, stakeholders felt that ELL students were one category of students that was not fully funded. The following table presents the results of the alternative adequacy approaches, the current model, and the study team's recommendation for ELL students.

Table 5.5
Support for ELL Students

Source	Additional Supports for ELL Students
Current Legislative Model	Provide 1.0 ELL teacher position for every 100 ELL students; Not provided for small or alternative schools.
2015 Evidence-Based	Provide 1.0 ELL teacher position for every 100 ELL students.
Professional Judgment	Panelists identified the following resources: 1.0 ELL teachers per 45 elementary ELL students, 1.0 per 35 middle school ELL students, and 1.0 per 25 high school ELL students, due to the increasing intensity of support needed for language acquisition in later grades. 1.0 ELL instructional aide per 15 ELL students and 1.0 FTE interpreter per 100 ELL students in all grades.
Successful Schools	About half of the successful schools had an ELL population, and of schools that did, a third did not provide ELL staffing. Another third provided ELL teachers, staffed on average at 1.0 FTE per 20 ELL students, and another third of schools with an ELL population provided 1.0 FTE ELL aide per every 30 students on average.
APA Recommendation	**Provide a 0.30 weight to every ELL student, assuming they will also receive the 0.30 at-risk weight, to provide language service interventions similar to PJ approach recommendations.** *This weight would be applied to total RCA-adjusted, base cost figure for a school, multiplied by the number of ELL students in the school.*

ELL instructional supports were significantly higher in the PJ recommendations and for the successful schools that had an ELL population. APA recommends providing a weight sufficient to provide language services closer to the recommendations of the PJ panels. This recommendation is similar to national adequacy recommendations, as shown in the following table. Weights varied for ELL, with an average around 0.50. The study team recommended a lower weight for ELL (0.30), knowing that these students would also receive the at-risk weight because being an ELL student is a qualifying factor in the state's definition of at-risk.

Table 5.6
Comparison of Recommendations for Weights for ELL Students from Other Adequacy Studies

Study	Weight
Wyoming Legislative Model	.30[13]
Colorado 2003 and 2006 PJ	.51
Colorado 2013 PJ	.47
Connecticut 2005 PJ	.76
Montana 2007 PJ	.71
North Dakota 2014 EB	.27
South Dakota 2006 PJ	.39
Average of All Studies	.49
Median of All Studies	.47
Mode of All Studies[14]	NA

[13] For a description of how Wyoming's weight was estimated, see footnote 12.

The recommended combined weight for ELL students will allow for research-based interventions to be offered such as:

Instructional Interventions: The What Works Clearinghouse finds strong evidence for the effectiveness of intensive small-group interventions for ELL students at-risk of reading problems in elementary grades (Gersten, et al., 2007). Specifically, they recommend implementing daily interventions for at least 30 minutes with groups of 3–6 ELL students who are struggling to read (Gersten, et al., 2007). A meta-analysis of ELL programs between 1970-2012, found that for reading outcomes in the elementary grades, the evidence supports a focus on professional development in strategies, including small group and one-to-one tutoring (Cheung, Slavin 2012) Further, studies found that earlier interventions from ELL students through an RTI system showed positive growth for students with a lasting effect in later grades. (Thompson, et al 2006, Carlo et al 2008, Kelly et al 2008, Haager and Windmuller 2001).

Extended Learning Opportunities: Research supports the positive impacts of extended learning time for ELL students, whether that time is attained before or after school, during summer school, or during the school day (Goldenberg, 2010) (Hakuta, 2011) (Gandara & Rumberger, 2007).

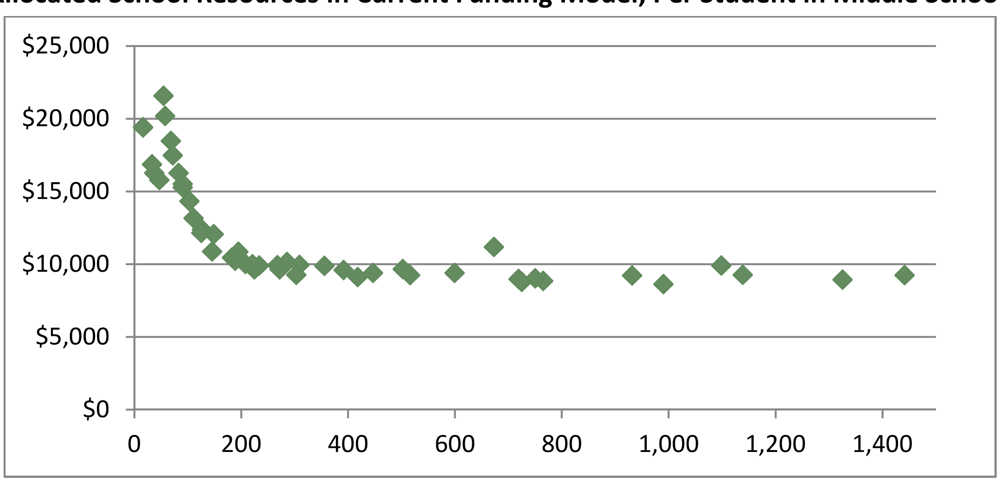
Size Adjustment

The study team recommends developing and applying a size adjustment formula to all model resources.

Currently, Wyoming adjusts for size both within individual model elements, such as when staffing is prorated at different rates between school sizes, and with a small schools size adjustment. By plotting current school resources as a dollar figure against school size, a size adjustment, or curve, can be seen in the current model. As an example, the following chart shows this information for middle schools in Wyoming.

Chart 5.1

Allocated School Resources in Current Funding Model, Per Student in Middle Schools



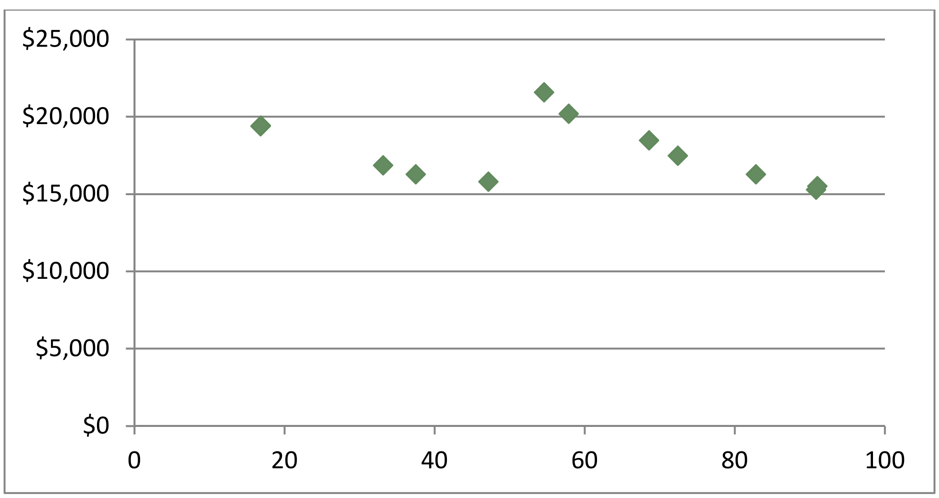
[14] No recommended amount appeared more than twice.

Using the size differential information from the PJ approach (developed by examining varying resource needs at different school sizes), the study team recommends developing a size adjustment formula to be applied to a "base" set of resources, meaning the resources should be generated as a per-student dollar amount in larger school settings. This base set of resources would be generated using APA's recommended ratios presented for each model element in this report. Applying a size adjustment formula like the one suggested in the chart above, would recognize that providing similar resources in a smaller setting requires adjusting for diseconomies of scale, such as the need for smaller class sizes, certain fixed positions, or high per-student dollar figures to address some fixed costs.

Applying a size adjustment in this manner, instead of the current approach of within model elements and the small school and district adjustments, would address some funding "cliffs" that exist in the model. A cliff is a point in the model where the difference of one more or less student can have a disproportionately large impact on the amount of funding a school receives. Looking back at the chart above, there are a couple points where cliffs exist, around the 50 student mark and the 630 student mark. The inconsistencies at the 50 student mark are related to the small schools adjustment, and the inconsistencies at the 630 mark are related to additional different staffing amounts at above and below that size threshold.

Chart 5.2 adjusts the scale to more closely examine allocations for schools around the 50 student mark.

Chart 5.2
Allocated School Resources in Current Funding Model, Per Student
Middle Schools between 0–100 students



What is apparent in the chart above is there is a significant impact of having 49 versus 50 students for a school due to the small schools adjustment. Currently, the differential of per-student funding for the elementary school is minimal but the differential for middle and high school funding is quite large. For middle schools, a 50 student school receives a minimum of eight teachers along with allocations for many other resource areas. A middle school at 49 students receives funding for seven teachers and less additional resources. The change of one student results in the addition or subtraction of a full teacher.

Calculating a base set of resources then applying a consistent size adjustment to all resources would smooth out these cliffs and create predictability for districts. Considering the size differential information from the PJ approach would ensure there is equity of opportunity for all schools regardless of size to provide similar resources to students. The study team would recommend a similar approach to a district size adjustment for central office resources.

Comparison of Additional Model Elements and Recommendations

In addition to the key recommendations described in detail above, the following tables present the results of the professional judgment and successful schools alternative approaches to adequacy, compared against the current legislative funding model and the results of the 2015 evidence-based study results for all other model elements. Based on the study team's examination of these varying data points, a recommendation for each model element is offered. These recommendations are used to calculate a base set of resources and adjustments for student and school characteristics.

Table 5.7
Elective Teachers

Source	Elementary	Middle	High
Current Legislative Model	20% of core elementary school teachers	33% of core middle school teachers	33% of core high school teachers
2015 Evidence-Based	20% of core elementary school teachers	20% of core middle school teachers	33% of core high school teachers
Professional Judgment	20% of core elementary school teachers	33% of core middle school teachers	33% of core high school teachers
Successful Schools	On average, about 16% of core teachers	On average, about 38% of core teachers	On average, about 51% of core teachers. *Note, only one high school was over 150 students, so variation is likely due to size and minimum staffing.*
APA Recommendation	**20% of core elementary school teachers**	**33% of core middle school teachers**	**33% of core high school teachers**

The findings in this area were relatively consistent across approaches with a couple exceptions, specifically the EB middle school staffing and the high school elective staffing for successful schools. Therefore, APA recommends continuing the elective staffing of the current funding model: 20 percent of core elementary teachers and 33 percent of core middle and high school teachers at the base level. For smaller schools, this elective staffing ratio would need to be higher to provide equity of opportunity and will be addressed as part of the size adjustment.

Table 5.8
CTE Teachers

Source	
Current Legislative Model	Apply an additional weighting factor of 29% to vocational education (CTE) student FTEs. Based on weighted student count, provide an additional teacher for every 21 students.
2015 Evidence-Based	No additional vocational education teachers resourced
Professional Judgment	1.0 additional CTE teacher per 400 high school ADM to reduce class sizes in CTE courses.
Successful Schools	Included in elective teachers.
APA Recommendation	**1.0 additional CTE teacher per 400 high school ADM.**

Currently, the funding model provides an additional CTE teacher for every 21 students in approved CTE programs. As noted, the study team instead recommends providing an additional CTE teacher per 400 high school students based on the recommendations from the PJ approach. Providing additional FTE on the basis of all students and not just students in certified CTE programs should allow schools to expand their current CTE offerings, which would satisfy community feedback about the need for greater emphasis on CTE for all students. If computer science is considered a component of the career spectrum, this staffing could also be used in that capacity.

Table 5.9
Minimum Teachers

Source	
Current Legislative Model	*Minimum Teachers* Elementary Schools: a minimum of 6.0 teachers provided for elementary school grade bands with ADM greater than 49. Middle Schools: a minimum of 8.0 teachers provided for middle school grade bands with ADM greater than 49. High Schools: a minimum of 10.0 teachers provided for high school grade bands with ADM greater than 49. For school grade bands of 49 and below, minimum teacher resources are provided on a prorated basis at 1.0 teacher for every seven students with a minimum of 1.0 teacher. Additionally, there is a “Small District Adjustment,” which provides districts with 243 or fewer ADM a minimum of one teacher at each school for every grade level ADM exists. *Minimum Staff (Small School Adjustment)* For elementary, middle, and high schools of 49 ADM and below, minimum staff resources are provided on the basis 1.0 assistant principal and 1.0 teacher for every 7.0 ADM, with a minimum of 1.0 teacher.
2015 Evidence-Based	*Minimum Teachers* Elementary Schools: a minimum of 7.0 teachers provided for elementary school grade bands with ADM greater than 49. Middle Schools: a minimum of 7.0 teachers provided for middle school grade bands with ADM greater than 49. High Schools: a minimum of 7.0 teachers provided for high school grade bands with ADM greater than 49. For school grade bands of 49 and below, minimum teacher resources are provided on a prorated basis at 1 teacher for every seven students, with a minimum of 1.0 teacher position. *Non-Teacher Staff Resources* For schools with ADM less than the highest grade band’s one-section school (96 elementary, 105 middle and high school) 1.0 assistant principal position is provided and other non-teacher staff elements are resourced based on total school ADM at the highest grade band and prorated down from a one-section school for all schools, where identified. Additionally, resources generated by the at-risk and ELL student counts are provided for all schools.

Source	
Professional Judgment	For smallest elementary schools, recommend 1.0 teacher per grade at 50 students, with a minimum of 1.0 teacher for a school. At secondary schools of similar size, a minimum of 8.0 teachers was discussed. Recommend school size adjustment (formula) to adjust base resources.
Successful Schools	For elementary schools of less than 100 students, on average 1.0 teacher per grade. Only two middle and high schools less than 100, so no average minimums reported. For K-12 schools, about 16 teachers total (11 core, 5 elective).
APA Recommendation	**APA recommends applying a size adjustment at the school level with a minimum funding level.**

In addition to the school size adjustment that would apply to all schools, the study team also recommends creating a minimum school funding level for the smallest schools. This size adjustment will be fully explained in the next chapter.

Table 5.10
Instructional Support: Instructional Facilitators and Tutors/ Interventionists

Source	Instructional Facilitators	Tutors/ Interventionists
Current Legislative Model	Resourced equal to 54% of the 2015 evidence-based recommendation for 2017-18 and 30% for 2018-19. Included in the block grant.	Provide a minimum of 1.0 tutor position for each prototypical school, resourced at the highest grade-band level, less tutor positions provided on basis of at-risk student count (1.0 tutor position for every 100 at-risk students)
2015 Evidence-Based	Provide 1.5 instructional facilitator/coaches for prototypical elementary (288 ADM) and secondary (315 ADM) schools at the highest grade-band level, with a minimum of 1.0 FTE for each school district.	Provide 1.0 tutor position for each prototypical school (288 ADM elementary school and 315 ADM middle or high school), resourced at the highest grade-band level.
Professional Judgment	Provide 1.0 instructional facilitator/coach per 15 teachers. Additional technology-specific coaches (technology specialists) were also recommended to help teachers incorporate technology in the class room at a ratio of 1.0 FTE per every 30 teachers.	Provide 1.0 tutor/interventionist per 300 Elementary and Middle School ADM, 1.0 per 400 High School ADM.
Successful Schools	Most successful schools had instructional facilitators at 1.0 per 360 ADM.	Elementary: over half had a tutor position at 1.0 per 230 ADM on average. Middle and High School: only four schools had a tutor position with a high variation in staffing ratio. *Interviews suggested this is an area that schools have made cuts, but felt the positions were valuable.*
APA Recommendation	**Provide 1.0 instructional facilitator/coach per 20 core teachers.**	**Provide 1.0 Tutor/Interventionist per 300 Elementary ADM and 1.0 per 400 Secondary ADM.**

The current funding model funds instructional facilitators at 54 percent of the EB recommendation for the 2017-18 school year, and 30 percent for 2018-19. Previously, the model had funded at 60 percent of the EB, which was more similar to the recommendation of the PJ approach but higher than available information from successful schools. The study team recommends providing a 1.0 instructional facilitator per 20 teachers. *Note, this is a revision from the prior draft recommendation of 1.0* *instructional facilitator per 15 teachers, largely due to stakeholder feedback. Further, it is clarified to apply to core teachers.*

Currently, the funding model provides a 1.0 FTE teacher tutor/interventionist per prototypical school, less any staffing generated based on a school's at-risk population. Both the EB and PJ make similar recommendations, but neither reduces the recommendation by any tutors/interventionists for at-risk students. The rationale from both the EB and PJ approaches is that by providing support and interventions for students in an RTI process, the need for later intervention is reduced. The study team recommends providing 1.0 tutor/interventionist per 300 elementary school ADM and 1.0 per 400 secondary ADM. *Note, the study team has revised its recommendation to make the tutor/interventionist allocation consistent for secondary grades.*

Table 5.11
Instructional Support: Librarians/Media Specialists, Library Aides

Source	Librarians and Librarian Media Aides
Current Legislative Model	Librarians: Provide 1.0 librarian position for prototypical elementary schools (288 ADM) prorate up and down for below and above 288 ADM. For middle or high schools with ADM between 105 and 630 ADM, 1.0 librarian position. Below 105 ADM prorate down, and above 630 ADM prorate up.
2015 Evidence-Based	Librarians: Elementary: For schools with ADM less than 96 ADM, prorate a 0.50 librarian position down; for schools with ADM between 96 and 143, provide a 0.50 librarian position. For schools with ADM between 143 and 288, provide a 1.0 librarian position prorated down to 143 ADM. Middle and High Schools: For schools with ADM less than 105 ADM, prorate a 0.50 librarian position down. For middle and high schools with ADM between 105 and 157.5, provide a 0.50 librarian position. For schools with ADM between 157.5 and 315, provide a 1.0 librarian position prorated down to 157.5 ADM. For all school districts, provide a minimum of 1.0 librarian position. Library Aides: For elementary schools with ADM greater than 288, prorate a 1.0 library aide position between 288 and 576 ADM. For elementary schools with more than 576 ADM, provide an additional library aide position for every 630 ADM. For middle and high schools, prorate up 1.0 library aide from 315 to 630 ADM; above 630 ADM prorate up 1.0 library aide for every additional 630 ADM.
Professional Judgment	Provide librarian/media specialists at a ratio of 300:1 up to 1.0 FTE. If less than 1.0 FTE, provide library/media aide to ensure a 1.0 total FTE across both positions.
Successful Schools	Librarian Positions: Elementary: about 50% of successful schools did not have certified librarian, 30% had a full-time librarian, and 35% had a partial librarian FTE (0.3 on average). Middle and High School: about 25% had a full-time librarian, 50% had a partial librarian FTE (0.3 on average), and 35% did not have a certified librarian. All schools over 300 ADM had a combined 1.0 FTE position between the librarian FTE noted, and library/media aides. Below 300 ADM, most schools had a partial library/media aide if they did not have a librarian, or had a combination of the two.
APA Recommendation	**Provide librarian/media specialists at a ratio of 300:1 ADM up to 1.0 FTE.**

Across all approaches, a 1.0 librarian was recommended at roughly 300 ADM (varying slightly between elementary and high school), so the study team recommended that ratio of a librarian position.

Table 5.12

Instructional Support: IT Technicians

Source	Library Media/Computer Technicians
Current Legislative Model	Library Media/Computer Technician Position: Provide 1.0 library media/computer technician position for every 315 middle and high school ADM, prorated up and down
2015 Evidence-Based	School Computer Technician Position: Provide 1.0 school computer technician position for every 630 elementary, middle and high school ADM, prorated up and down, with a minimum of a 0.5 position for each district.
Professional Judgment	School Computer Technician Position: Provide 1.0 computer technician per 250 ADM.
Successful Schools	Not addressed in available data.
APA Recommendation	**Provide 1.0 computer technician per 250 ADM.**

The study team recommends providing a 1.0 computer technician per 250 ADM at all grade levels per the PJ recommendations. This is at a higher level than both the current legislative model and the EB recommendations, but is done recognizing the increased technology needs of modern schools, particularly as there is an emphasis on technology-related fields.

Table 5.13

Instructional Support: Instructional Aides (Paraprofessionals) and Supervisory Aides

Source	Instructional Aides (Paraprofessionals) and Supervisory Aides
Current Legislative Model	Provide funding at an amount equal to 2.0 supervisory aide positions for each prototypical elementary school (288 ADM); 2.0 supervisory aide positions for each prototypical middle school (315 ADM); 5.0 supervisory aide positions for each prototypical high school (630 ADM); resourced at the highest-grade prototype using total school ADM.
2015 Evidence-Based	Provide funding at an amount equal to 2.0 supervisory aide positions for each prototypical elementary school (288 ADM); 2.0 supervisory aide positions for each prototypical middle school (315 ADM); 3.0 supervisory aide positions each prototypical high school (630 ADM); resourced at the highest-grade prototype using total school ADM.
Professional Judgment	Instructional Aides (Paraprofessionals): Provide 1.0 per 100 elementary ADM or 300 middle school ADM or 400 high school ADM. Supervisory Aides: Provide 1.0 per 150 elementary and middle ADM or 200 high school ADM. Floor of 1.0 per campus.
Successful Schools	Instructional Aides: On average, 1.0 FTE per 175 elementary ADM and 1.0 FTE per 350 middle school ADM. Used in half of the successful high schools, at a similar ratio to middle school. Most schools did not have supervisory aides.
APA Recommendation	**Provide 1.0 per 350 ADM. *(Note, does not include special education or transportation aides.)***

The study recommends providing a 1.0 aide per 350 ADM, which could be either instructional or supervisory. There is little research supporting instructional aides, so the study team was more conservative in the recommendation in this area. *Note, the study team revised its elementary recommendation to allow for the slight increase in funding elementary grades teachers at 18:1 (instead of the average of 18:3) and to be consistent across grade levels.*

Table 5.14
Student Support

Source	Student Support Staff	Nurses
Current Legislative Model	Core Pupil Support Staff: A minimum of 1.0 pupil support staff position is provided for each prototypical school, resourced at the highest grade-band level, less pupil support staff positions provided on basis of at-risk student count (1.0 pupil support staff position for every 100 at-risk students). Core Guidance Counselors: Provide 1.0 guidance counselor position for every 250 middle and high school students.	No nurses resourced directly, but can utilize minimum pupil support resources as nurse positions
2015 Evidence-Based	Core Pupil Support Staff: Only provided on the basis of at- risk student counts. Core Guidance Counselors: Provide 1.0 guidance counselor position for each prototypical elementary school (288 ADM) and 1.0 guidance counselor position for every 250 middle and high school ADM.	Provide 1.0 nurse position for every 750 ADM.
Professional Judgment	Provide 1.0 Student Support position (could include counselors, social workers, behavior specialists) per 200 ADM.	Provide 1.0 nurse position for each campus.
Successful Schools	Elementary: Not every school had a student support position less than 288 ADM. Above that threshold, most had counselors at a ratio of 380:1. Middle: all schools had student support staffed on average at 250:1. High Schools: all schools had student support staff at an average ratio of 170:1.	On average, successful schools had a 0.5 nurse, with larger schools more likely to have a 1.0 nurse.
APA Recommendation	**Provide 1.0 Student Support position (could include counselors, social workers, behavior specialists) per 200 ADM.**	**Provide 1.0 nurse position for every 750 ADM up to a 1.0 FTE. Consider adjustment for remoteness to address medical services response time issue.** *These nurses are separate from any nurse FTE for special education.*

The EB approach provides counselors for secondary schools at a ratio of 250:1 (as does the legislative model), and EB also provides a counselor for a prototype elementary, but does not provide additional student support without at-risk. National adequacy comparisons suggest that the current model is lower in this area, so the study team's recommendation for student support (a category of staff that could include counselors, social workers, and behavioral specialists) is based on the PJ approach recommendations and feedback from stakeholders and successful schools interviews regarding the importance of social and emotional support needed for all students.

For nurses, which are not currently included in the funding model, the study team's recommendation is based on the EB approach's recommendation and took into consideration the staffing in successful schools. The PJ panels also thought nurse positions were important, up to 1.0 per campus/area depending in part on response time, so remoteness should be considered and adjusted for. Additional nursing staffing would still be allowable as part of the special education reimbursement model.

Table 5.15
Support for Gifted and Talented, Alternative Programs/Schools

Source	Gifted and Talented	Alternative Programs/Schools
Current Legislative Model	Provide an amount equal to $40.29 per ADM	Provide funding for all staff at a ratio of 1.0 assistant principal and 1.0 teacher position for every 7 ADM
2015 Evidence-Based	Provide an amount equal to $40.00 per ADM	No separate formula; Fund as any other school
Professional Judgment	Provide an amount equal to $40.00 per ADM *1.0 FTE Gifted and Talented Teacher per 420 elementary ADM included in prior Specials/Electives Staffing.*	Identified resources to provide approved alternative programs or schools. For a program for 150 students: 18.2 teachers (class size half that of a traditional high school), 1 instructional aide, support staff at a ratio of 100:1, a nurse at 375:1, 1.0 principal, and 2.0 clerical.
Successful Schools	Elementary: 25% had a partial FTE (0.2 on average), and 10% had a 1.0 FTE (all 3 schools over 350). Two middle schools and one K-12 also had a partial GT teacher FTE, all remaining schools did not have an identified GT teacher.	Not addressed.
APA Recommendation	**Provide an amount equal to $40.00 per ADM.**	**Fund as any other school, but ensure that all students receive the 0.30 at-risk weight.**

The current funding model provides a per-ADM amount for gifted and talented, which is also recommended by the PJ and EB approach. The PJ approach and successful schools approach both indicated the need for teacher staffing at the elementary level through elective staffing. As such, the study team recommends providing $40 per ADM for gifted and talented. For approved alternative programs/schools the study team believes the resources recommended by the PJ approach would be sufficiently addressed by funding alterative programs/schools based on their size, and ensuring that all students receive the recommended 0.30 at-risk weight.

Table 5.16
Administration

Source	Principal	Assistant Principals
Current Legislative Model	Provide 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, prorated by ADM below 105 ADM down to 49 ADM.	Provide 1.0 assistant principal position for every 288 elementary ADM beginning at 289 ADM; 1.0 assistant principal for every 315 ADM middle and high school beginning at 316 ADM.
2015 Evidence-Based	Provide 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools.	Provide 1.0 assistant principal position for every 288 elementary ADM beginning at 289 ADM and for elementary schools below 96 ADM; 1.0 assistant principal for every 315 ADM middle and high school beginning at 316 ADM, and for middle and high schools below 105 ADM.
Professional Judgment	Provide 1.0 principal for every campus.	Provide assistant principals at a ratio of 1.0 per 350 ADM at secondary level.
Successful Schools	Across grade configurations, schools less than 125 students had a partial principal position (ranging from a 0.2 to a 0.9, with a 0.5 FTE average).	Middle and high schools over 315 ADM had an assistant principal.
APA Recommendation	**Provide 1.0 principal.** *Note, at some smaller schools the FTE is less than 1.0, a consideration of the size adjustment.*	**For all schools (elementary and secondary) with 500 students or more students, provide 1.0 FTE assistant principal per 500 ADM.**

A 1.0 principal FTE is recommended at the base level. For smaller schools, a smaller portion of principal FTE may be provided to account for a shared position across more than one school. For larger schools, a 1.0 FTE is still provided. An assistant principal is recommended at a ratio of 1.0 per 500 ADM at both the elementary and secondary level. *Based upon stakeholder feedback and concerns about equity across schools, the study team revised its initial recommendation that provided assistant principals only at the secondary level.*

Table 5.17
Clerical Staff

Source	Clerical Staff
Current Legislative Model	Secretarial Staff: Provide 1.0 secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels. Provide an additional 1.0 secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle and high school ADM starting at 315 ADM Clerical Staff: Provide 1.0 clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM. Provide 4.0 clerical positions for every 630 high school ADM, prorated above and below 630 ADM All FTE positions prorated up or down from prototypical level and resourced at the highest grade.
2015 Evidence-Based	Secretarial Staff: Provide 1.0 secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels. Provide an additional 1.0 secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle and high school ADM starting at 315 ADM Clerical Staff: Provide 1.0 clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM. Provide 2.0 clerical positions for every 630 high school ADM, prorated above and below 630 ADM All FTE positions prorated up or down from prototypical level and resourced at the highest grade prototype using total school ADM.
Professional Judgment	Elementary: provide 1.0 Office Manager and 1.5 clerical positions in base school of 300 Middle: provide 1.0 Office Manager and 3.0 clerical in base school of 525 High School: provide 1.0 Office Manager and 6.0 clerical positions in base school of 1000.
Successful Schools	For schools over 300, clerical staff at 1.0 FTE per 250 students (1.0 FTE per 175 ADM overall).
APA Recommendation	**Provide 1.0 Secretarial/Office Manager FTE. Provide 1.0 clerical FTE per 200 ADM.**

APA's recommendation for clerical support is an averaging across approaches.

Table 5.18
Non-Personnel Costs: Professional Development, Instructional Materials, Assessments, Technology

Source	Professional Development	Instructional Materials	Formative Assessments	Technology and Equipment
Current Legislative Model	Provide 10 days of student free time for training in salary levels; $125.90 per ADM for trainers.	Provide $191.37 per ADM.	Provide $25 per ADM.	Provide $250 per ADM.
2015 Evidence-Based	Provide 10 days of student free time for training in salary levels; $125.00 per ADM for trainers.	Provide $190.00 per ADM.	Provide $25.00 per ADM.	Provide $250 per ADM.
Professional Judgment	10 days of professional development included in current contract amount; $150 per ADM for trainers, stipends, materials, etc.	Provide $250 per elementary ADM, $300 per middle ADM, and $470 per high school ADM.	Provide $30 per ADM.	Provide an amount equal to $260 per ADM for annual technology hardware.
Successful Schools[15]	District cost	District cost	District cost	District cost
APA Recommendation	**In addition to professional development days in recommended salary amount, provide $125 per ADM.** *Adjust by ECA.*	**Provide $190 per ADM** *(adjusted by school district size and ECA).*	**Provide $25 per ADM.**	**Provide $250 per ADM.**

The study team recommends the current funding model amount for professional development, assessments, and technology hardware. After further examination of expenditure data, the study team also recommends using the current $190 per ADM amount for supplies and materials, but adjusting it for district size to support equity of material offerings.

Table 5.19
Non-Personnel Costs: Substitutes

Source	Substitutes
Current Legislative Model	Provide for 5% (8.75 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches, and teacher positions for summer school and extended day. Resourced at a daily salary equal to $102.97 plus 7.65% for social security and Medicare benefits ($110.85). Substitute resources provided for small schools.
2015 Evidence-Based	Provide for 5.715% (10 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches and teacher positions for summer school and extended day. Resourced at a daily salary equal to $102.97 plus 7.65% for social security and Medicare benefits ($110.85). Daily salary adjusted by regional cost adjustment.
Professional Judgment	$270 per ADM for substitutes
Successful Schools	District resources not addressed in Successful Schools
APA Recommendation	**Provide 15 days per core and elective teacher; resourced at a daily salary equal to $106.84 including benefits.** *This amount will be included in the base personnel cost figure and adjusted by size and the RCA.*

[15] Note that in the draft report, some cost figures were provided for successful schools. After reviewing expenditure data with WDE/LSO staff it was determined that these costs were best captured at the district-level, so school level figures specific to successful schools are not included.

The study team recommends a similar allocation approach to the EB model (and current legislative model), but increasing to 15 days to reflect educator feedback and data indicating 10 days was not sufficient.

Table 5.20

Student Activities

Source	**Student Activities**
Current Legislative Model	Funded at grade-band level, by school. For grades K-5, provide an amount equal to $23.79 per student. For grades 6-12, use inverse sliding scales based on student enrollment for grades 6-8 and grades 9-12. Grades 6-8 school funding levels range from $782.54 for 1 ADM and $202.18 per ADM for a school of 1,260 ADM. Grades 9-12 funding levels range from $2,017.22 for 1 ADM and $594.63 per ADM for a school of 1,260 ADM. Fund alternative schools as any other school.
2015 Evidence-Based	Provide a total level of funding equal to $314.66 per ADM, but utilize a per ADM amount for elementary schools and sliding scale amounts for middle and high schools, at reduced levels. For elementary grades, provide an amount equal to $23.62 per ADM. For middle and high schools, use inverse sliding scales based on ADM. Middle school funding levels range from $776.95 for 1 ADM and $200.74 per ADM for a school of 1,260 ADM. High school funding levels range from $2,002.82 for 1 ADM and $590.39 per ADM for a school of 1,260 ADM. For alternative schools, fund as any other school. Sixth grade elementary students funded using the elementary per ADM amount and ninth grade students included in the high school ADM for the schools they would attend.
Professional Judgment	$25 per elementary ADM, $300 per middle school ADM, $720 per high school ADM.
Successful Schools	Not addressed.
APA Recommendation	**Use current legislative approach to funding student activities based upon school size.**

The study team recommends funding student activities using the current legislative model, which differentiates funding by middle and high school size (smaller schools receiving higher funding). I*n its draft recommendations, the study team proposed using actual expenditures. After reviewing its expenditure analysis with WDE/LSO staff, the study team concluded that the per ADM figures are generated through this existing approach were sufficiently aligned with actual.*

Finally, Tables 5.21 on the following page presents the district-level resources needed.

Table 5.21
District Staff

Source	District Resources
Current Legislative Model	Central Office Personnel: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions 1,000 ADM: 4.0 administrative and 4.0 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM. 3,500 ADM: 8.0 administrative and 10.0 classified positions. Position counts prorated down linearly between 3,500 to 1,000 ADM; Position counts prorated up linearly above 3,500 ADM Non-Personnel Resources: Provide an amount equal to $365.86 per ADM for non- personnel resources.
2015 Evidence-Based	Central Office Personnel: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions; 1,000 ADM: 4.0 administrative and 6.5 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM; 2,000 ADM: 5.5 administrative and 9.0 classified positions. Position counts prorated down linearly between 2,000 and 1,000 ADM; 4,000 ADM; 8.0 administrative and 16.0 classified positions. Position counts prorated down linearly between 4,000 to 2,000 ADM; 12,000 ADM: 24.0 administrative and 39.0 classified positions. Position counts prorated down linearly from 12,000 to 4,000 ADM. Position counts prorated up linearly above 12,000 ADM Non-Personnel Resources: Provide an amount equal to $363.25 per ADM for non- personnel resources.
Professional Judgment	Central Office Personnel: At base district of 10,700 ADM: 17 administrators, 20 professionals, and 24 classified positions Non-Personnel Resources: provide $240 per ADM District-level size adjustment (formula) to account for diseconomies of scale due to district size, such as higher supplies and materials costs and minimum position needs.
Successful Schools	District resources not addressed.
APA Recommendation	**Legislative model personnel and non-personnel resource allocations.**

The study team recommends using the existing model's personnel and non-personnel resource calculations. In the draft report, the study team recommended the resources identified through the PJ process. *After calculating the cost impact, the study team recommends the more conservative resourcing of the legislative model given stakeholder feedback strongly suggests that additional resources are not needed at the district level.*

Reimbursements, Model Parameters, and Adjustments

The study team offers summaries below of the recommendations that resulted from the additional analyses related to reimbursements, model parameters, and adjustments each presented in the supplemental reports.

Special Education Reimbursement Model

As the state considers changes to the current special education reimbursement model, it needs to consider federal requirements related to maintenance of fiscal support (MFS) and maintenance of effort (MOE).

If Wyoming fails to maintain fiscal support for special education and is not granted a waiver, its federal allocation would be reduced dollar for dollar of the shortfall in fiscal support. The MFS is a statewide aggregate amount of spending related to IDEA (Wyoming received approximately $22.5 million in IDEA federal funds for FY16-17). For FY 2015-16, Wyoming's calculated MFS including the BHD (Wyo. Dept. of Health division) and other state level budgets was about $260 million. MFS compliance is determined by the amount of state financial support *provided or made available*, regardless of how much was spent.

The state is also required to ensure that any local education agency (LEA) receiving IDEA funds complies with local MOE requirements. This is requirement is separate from MFS. If a district fails to meet effort, the state must repay (using non-federal funds) the difference between what the district actually expended and what they should have spent to meet effort. It is important to note that there are no waivers for MOE only "exceptions."

Allowable exceptions for a district include:

- Voluntary or for-cause departure of special education staff;
- Decrease in enrollment of IDEA eligible children;
- Termination of an exceptionally costly program for a particular child, under certain circumstances;
- Termination of costly expenditures for long-term purchases; and
- Assumption of cost by its state's high-cost fund.

Given the limitations on changes to the current model due to federal requirements and the overwhelming stakeholder feedback in support of the reimbursement model, the study team recommends improving special education funding through the existing approach. There are certain aspects of the current approach that, if upgraded, could lead to improved efficiencies and more equal distributional results.

A first step to increase efficiencies in special education would be to increase WDE oversight of district expenditures to identify areas in which greater efficiencies in district operations could be achieved. As a guideline, WDE staff could begin with an exception approach to review the instructional programming practices, types and related services provided to students, staffing patterns by types of staff, and enrollments and identification practices of those districts at the high and spending extremes, i.e., the outlier districts. What are these districts doing that either raises or minimizes their costs? Are they applicable to other districts? Do they have a positive or negative impact on students and learning outcomes? This would offer opportunities to understand actual district practices in more detail, find good practices to share more broadly across the state, and make recommendations on improving district practices and efficiencies. With a broader perspective, WDE staff are also in a position to identify, recommend, and support cross-district opportunities for shared services and more efficient joint operations.

A parallel effort to develop and implement specific activities and state oversight is recommended. These actions focus on WDE and educational policy initiatives that can improve efficiencies in special funding and implementation for the state and districts.

1. <u>Create program guidelines to identify best practices for instructional programming to guide districts to improve their operations</u>. Draw on the review of current district practices in Wyoming as well as

educational and instructional research to build an inventory of effective practices for districts to consider and implement.

2. Establish staffing guidelines. Develop a set of recommended or expected student/staff ratios or caseloads for the major types of service delivery options for various types of special education students. The guidelines could be either recommended or mandated. Generally, the ratios should specify ranges of practice, rather than a single number to allow for individual district circumstances, particularly the potential case of fewer students in the district than is identified in the guidelines. It is unknown whether the recommended staffing guidelines would be more or less than currently seen in districts, so it cannot yet be determined if there would be MOE implications.

3. Examine the wide differences in incidence rates of special education students among districts. Students are brought into special education through an identification and evaluation process that is operated by school districts. At present, the results of these individual district processes yield substantial variation across districts in the number of students that are deemed qualified for and receive services for special education. An identification process that became more standardized across the state utilizing similar disability definitions, evaluation practices, and eligibility guidelines, would provide uniform eligibility for students and avoid excessive identification and special education placement, since once students enter the special education system, they tend to be retained in the system. Consequently, the initial evaluation for special education can commit a student to 12 years of special education and obligate the system to long-term, ongoing, multiple year costs. Improved initial evaluation practices and regular reevaluations can lead to fewer students involved in special education with lower system costs. The caveat for this approach is that the purpose and focus of the evaluations should be on providing appropriate special education services, not reducing costs.

4. Link instructional program guidelines to approved funding. Another aspect that can influence district expenditures and control costs is to link program standards/practices into funding. In other words, base special education reimbursements for districts on approved program practices. This is a much more complicated approach, as it involves creating (and maintaining) a range of approved program practices that districts can use, and it requires much more documentation and auditing to validate student eligibility, enrollment, the instructional practices, and the use of funds for special education. However, it does provide a means for the state to guide and influence district decision-making regarding special education resources that would be compatible with a cost-based funding model. Again, it is unknown if/how the approved instructional programs and practices would be different than current district practice, so it cannot yet be determined if there would be MOE implications.

5. Utilize BOCES to a greater extent to provide additional special education services. The residential BOCES are already established to provide efficient programs and services for low-incidence, high-cost disabled students on a regional basis. It would be appropriate to consider expanding services to selected other types of disabled students in nearby districts or throughout the state through instructional technology. A separate supplemental report addresses these opportunities.

6. Identify opportunities for shared services for personnel and equipment. There are many areas to improve efficiency through shared services to support special education students across multiple districts. A separate supplemental report addresses these opportunities.

7. Use technology and distance education to provide special educational programs for students in multiple and remote districts. Given the small special education populations, large area, and long distances between schools and districts, educational technology is an approach that could both broaden the reach of needed special education programs to widespread students and do so at an efficient cost. One instructor, using distance education equipment, is able to serve multiple students in multiple locations simultaneously, spreading the cost of the instructor (and other program costs) over a larger number of far-flung students.

The full special education study is included as Supplemental Report E.

Transportation Reimbursement Model

The study team offers the following recommendations related to transportation:

Enforce Reimbursement Restrictions

The existing regulations contain provisions that control reimbursement levels and costs. These regulations must be enforced systematically.

Walking Zones: Regulations establish walking zones and provide no reimbursement for students transported within walking zones unless a hazardous condition exists. By regulation, the hazardous designation must be reconfirmed each year. The methods of evaluating hazards and reconfirming hazards annually should be reviewed. In addition, the methods of restricting reimbursement payments for transportation within a walking zone should be reviewed. In some cases, a minor investment could eliminate the hazard thereby reducing reimbursement over the long term. For example, installation of a sidewalk or employment of a part-time crossing guard may eliminate the need for another bus. A decision-making method should be established to review these opportunities. In the past, federal grant funding has funded these improvements.

Sharing Routes between School Districts: The state regulations restrict the sharing of transportation services between school districts. In limited situations, a bus from one district drives through an adjacent district to deliver students to an out-of-district school or for other reasons.

Parent Contracts: Parent contracts can be used selectively to reduce the number of buses or excessive travel times and distances.

Capital Investment: The number of buses also governs the cost of driver wages and benefits. Therefore, using buses efficiently controls more than 60 percent of the cost of transportation, meaning that decisions to add buses are very critical in controlling reimbursement and cost. The regulations require justification for adding additional buses beyond the number used in 1999 and require review of bus numbers if enrollments decline more than 15 percent in three years. The justification and review methods should be enhanced to consider best practices in routing efficiency. Efficiency factors will be discussed in the next section.

Redefining Allowable Costs: Some atypical costs are reimbursed, including loading zone assistants and bus aides. Constant pressures exist from parents and school employees for addition of optional and expensive services. If fully reimbursed by the state, little reason exists for school administrators to deny requests for these optional services or look at less expensive options.

Promoting Efficiency in Utilization of Bus Capacity

Efficient routing optimizes the use of both seating capacity and the time available. Time constraints can be set by school board policy governing maximum ride times or by bell times of schools.

Assigning Bus Runs to Routes – Multiple Routes: The number of schools served by a bus each morning and afternoon is the biggest factor in cost effectiveness. These opportunities to utilize buses more fully may not exist in smaller, sparsely populated districts. But, since the larger districts receive a large share of total reimbursement, it is important to target multiple routing efforts in those districts. Multiple routes mean that a bus does a run for one school followed by a run for another school or even a third school. Multiple routes require school bell times to be staggered, allowing a bus to pick up students for the first school, drop them off at the school, and then begin to pick up students for the next school. The regulations currently require justification to add vehicles and require consideration of multiple routes in adding buses. Various factors restrict the option of multiple routes. For example, a sparsely populated district with all schools located near each other may need to have long bus rides with few students on the bus. Adjustment to bell times may be required to allow multiple routing and require extensive analysis, planning, and communication.

Promoting Efficiency by Reducing the Number of Buses Required

Seating Capacity: Larger buses with more seating capacity can reduce costs by reducing the number of buses purchased and drivers employed. The initial purchase price, amortized over the life of the vehicle, and the operating costs are small compared to the cost of the driver, including salary and benefits. In addition, the seating capacity of buses purchased should also be carefully considered, as larger buses may be able to replace two smaller buses, thereby saving the costs of a driver's salary and benefits. The process to justify and review bus replacement proposals should systematically review both the utilization of seating capacity and time available at each school and the potential for multiple routes before approving new buses. If efficiencies are possible, funding incentives could be offered to fund the purchase of larger buses and an efficient mix of correctly sized buses.

Providing Technical Assistance in Bus Routing: Modern school transportation routing software is very sophisticated and uses the capabilities of navigation systems increasingly common in passenger and commercial vehicles. Extensive training is necessary on both the software options and the strategies for efficiency. Routing efficiency improvement plans may take several years to implement through wise sequencing of various strategies. While software, Global Positioning Systems, and training are currently reimbursable, the use of these methods may require incentives and funding of demonstration projects.

Technical assistance with sophisticated transportation routing software and methods can reduce route mileage as well as improve utilization of capacity and ride time. The assistance should be focused on districts with rapid increases in daily miles.

Transitioning to a Density Formula

Density formulas are used to fund student transportation in a number of states. Area density is based on the number of students per square mile. Linear density is based on the number of students per miles traveled by the buses. Districts are grouped by density and varying reimbursement rates are applied to each group, generally based on the average rates used by districts in that density group. These rates can be adjusted annually and could make the increase subject to a transportation cost index.

The recommendation is to select a model district from each group and provide technical assistance in bus routing efficiency to establish best practices for that group's situation. During the three-year period required to select and work with districts, the remainder of the districts would be provided training on bus-routing efficiency and transportation system improvement planning. In the fourth and fifth year, a density formula would be implemented, subject to a transportation cost index.

The full transportation study is included as Supplemental Report E.

Model Parameters and Adjustments

Student Count Determinations

ADM: For calculating ADM, the study team recommends using the greater of prior year ADM or three-year average ADM at the district-level instead of at the school-level, as is currently done. The study team believes this method is most appropriate for addressing declining enrollment in districts. Therefore, whichever determination is made at the district level (using prior year or three-year average) will be applied at the school level.

At-Risk: At-risk students are currently defined as the unduplicated count of ELL students in grades K-12, free and reduced lunch eligible students in grades K-12, and mobile students in grades 6-12. The study team supports continued use of this approach.

ELL: The study team recommends using the state's current definition of an active ELL student as a student who:

- Is newly enrolled in the district or enrolled in the district after the state annual ELP assessment,
- received ACCESS for ELLs™ in the prior school year,
- Has been identified and evaluated by the district as being an active ELL student through the use of an ELP screening assessment;

  or
- Is returning to the district from the previous school year,
- Took the state's annual ELP assessment in the prior school year, and
- Has not yet achieved the "proficiency" level.

The state also includes students that have exited the ELL program but are in the first two years of monitoring.

Benefits and Health Insurance

The study team believes the state uses a rational and cost-based approach to determining benefits and health insurance amounts, and recommends continued use of those calculation methods. Currently, this is calculated as:

- Health insurance:
    - A health insurance composite amount is calculated for each generated FTE based on prior-year, statewide average, district-weighted actual participation in district health insurance plans as to the proportion of employee-only, split-contract, employee plus spouse or children and family coverage for the state's health insurance contribution amounts paid on behalf of state employees as of January 1 of the preceding school year.
- Benefits:
    - <u>Worker's Compensation</u>: 0.70 percent of salary
    - <u>Unemployment Insurance</u>: 0.06 percent of salary
    - <u>Retirement</u>: 12.69 percent of salary within the block grant (7.12 percent employer share and 5.57 percent employee share) and reimburse actual expenditures as required by current law (1.25 percent employer share)
    - <u>Social Security and Medicare</u>: 7.65 percent (6.20 percent for Social Security and 1.45 percent for Medicare)

Maintenance and Operations

The study team believes the state uses a rational approach to funding maintenance and operations, including personnel and other costs. The study team recommends that the state increase allowable square footage to account for actual square footage for buildings built after 2002 to the state's specifications (excluding district-elected enhancements) and restrict allowable definition for non-instructional district acreage. Finally, the study team recommends funding utilities on basis of three-year average for actual utilities expenditures; this three year average should be fixed and then updated with each recalibration process. Otherwise, the study team recommends use existing model calculations.

Regional Cost Adjustment

The study team agrees with Taylor's 2015 recommendation that the state adjust teacher salaries according to a comparable wage index (CWI). This approach uses the wages of non-teaching professionals as a benchmark for what teacher wages would be if they were determined in competitive labor markets. The greatest challenge schools face in getting high-quality teachers is attracting them to teaching instead of pursuing other job opportunities. This approach accounts for the attractiveness of non-teaching jobs, sometimes referred to as the opportunity cost that teachers weigh when they choose to teach.

The key advantage of the CWI over the Wyoming Cost of Living Index (WCLI) and the 2005 Hedonic Wage Index (HWI) is its simplicity. The CWI approach relies only on the assumption that wages for non-teaching professionals, which are determined through numerous negotiations between employers and employees in competitive labor markets, appropriately reflect the complex interaction of cost of living and the attractiveness of an area's amenities. Unlike the HWI, the CWI is also easily understood by a non-technical audience because, while there are important but relatively minor statistical adjustments to ensure teachers and non-teachers have comparable characteristics, it ultimately reflects the average wage of non-teaching professionals in each region. Regions where non-teaching professionals, such as managers and executives, earn relatively higher salaries will be allowed to offer higher salaries for teachers than regions in which non-teaching professionals earn less.

As with Taylor (2015), the study team also recommends the state use the full index to adjust the salaries in each county. The current RCA approach moves the majority of districts to the statewide average because the minimum index value for any district is the base of 100. This results in overpayment of some teachers in lower-paying counties. The harm in this approach is that these overpayments reflect state money that could be used for other educational investments, therefore the study team recommends using an unadjusted CWI.

The full study on the Regional Cost Adjustment is included in Supplemental Report C.

External Cost Adjustment

The study team recommends using a four part adjustment based on the following indices:

- <u>Professional staff</u>: use the Wyoming specific Comparable Wage Index;
- <u>Non-professional staff</u>: use the Wyoming specific High School Comparable Wage Index;
- <u>Supplies and Materials</u>: use the Producer Price Index (PPI) for Office Supplies and Accessories; and
- <u>Energy</u>: use the PPI for Commercial Electric Power and Commercial Natural Gas

Prior recalibration work has a well-established rationale for recommending the state continue to use the established indices to account for the change in relative growth of prices in each of these areas. The study team recommends the state make external cost adjustments according to this formula if its wishes to maintain equity of funding over time. Although the preferred approach is to recalculate and apply the four indices on an annual basis, the study team believes that the cost pressure monitoring method adopted in 2012 is a reasonable alternative for ensuring the funding model remains cost-based. However, the study team does recommend that the state establish specific criteria against which changes in resource prices in the four areas may be compared for determining whether application of the ECA is warranted and the size of the ECA adjustment.

The full study on the Regional Cost Adjustment is included as Supplemental Report C.

Efficiencies through Shared Services and Consolidation

The primary recommendation is to use alternatives to full district consolidation because many of the advantages of consolidation are achievable without some of the additional challenges and negative consequences of consolidation. These alternatives include intergovernmental cooperation agreements among school districts, expansion of cooperative services provided through the Boards of Cooperative Educational Services, as well as continuation and expansion of informal sharing arrangements.

Another major recommendation is to conduct several regional summits of districts to explore the full potential of shared services. The summits should include districts that contain the most characteristics favorable to consolidation. At those summits, extensive data would be shared to stimulate creative yet realistic innovation on shared services that allow districts to become as cost effective as possible. As shown in this report, extensive enrollment, staffing, financial, and demographic data can be provided on maps. Prior to the summit, districts would be provided a detailed list of questions and information requests that will be important for a productive discussion and to formulate recommendations. The summits should have experienced representatives from administrations, school boards, BOCES, and selected interest groups. A skilled facilitator should be used. The specific recommendations from these summits should include a detailed cost benefit analysis and proposed implementation plan. The results of these summits should be disseminated widely.

In advance, the Consolidation Model should be run for the districts selected. The model provides a target of savings possible through full consolidation, but also provides information on savings through school-level consolidation. To understand the potential of school-level consolidation, a geographic information system (computer mapping) should be used to locate the residence of all current students by grade level and current school attended. It would also locate the schools and the capacity of each. This geocoding of students and school capacities can then utilize the capabilities of modern GIS systems to populate the nearest students to each school as measured by driving time, not distance. It is possible that both school-level and district-level consolidation will be recommended. It is also likely that an expanded role for BOCES will be identified in detail and the cost benefit ratios can be used to understand how those services can be funded. Many districts are using computer mapping and GIS capabilities as part of their transportation routing software.

The full efficiencies study is included as Supplemental Report F.

Elements not Currently in Funding Model that should be Considered

Finally, there are a number of elements not currently in the funding model that the state should consider if available revenue allowed, presented in Table 5.21 on the following page. One element is to include funding preschool for at-risk four year olds to reduce the need for intervention in later grades and potentially reduce special education identification rates. A second element is providing school resource officers to support school safety. The remaining item is to consider supplementing food service, which is not self-sustaining in many districts. Since these items are not specifically required as part of the educational basket of goods and services, the study team has not included them in the recommended changes to the Funding Model.

Table 5.21
Elements not Currently in Funding Model that should be Considered

Model Element	Legislative Model	2015 Evidence-Based Recommendation	PJ Panel Recommendations
Preschool/Early Childhood Education Programs	Not part of the educational basket of goods and services or the legislative model	Provide a voluntary, full-day preschool program for all children aged three and four as a categorical program outside the block grant, funded at the rate of $14,271 for every 1.0 full day preschool student	Provide a voluntary, half-day preschool program for all four-year-olds, funded at the rate of $12,510 for every 1.0 full-day preschool student (adjusted for school size)
School Resource Officers (SROs)/School Security	Not part of the educational basket of goods and services or the legislative model	Do not recommend funding SROs, but if the Legislature elects to do so, it should be funded through a categorical grant program that reimburses the portion of time SROs actually spend in school (175 school days times 6.5 hours) and assumes that local government agencies remain the employers of SROs for insurance and equipment purposes. A comprehensive school safety and security program should include additional mechanisms, such as climate surveys and coordination of local law enforcement, emergency responders and public schools.	Recommend 1.0 SRO per campus
Food Service Programs	Not part of the legislative model; Assumed to be self-supporting	Not part of the evidence-based model; Assumed to be self- supporting	According to panelists, food service is not self-sustaining and supplemental funding should be available

VI. Cost Implications of Recommendations

The study team would like to again stress that while specific school and district resource recommendations were presented in the prior chapter, the recommendations are used as a means of determining the adequate level of resources needed and are not a prescriptive model for implementation. The study team encourages flexibility for schools and districts to determine how best to employ resources to their serve students by the state continuing to provide resources through a block grant. Further, specific need-based resources noted previously represent the base, or floor, amount needed – not in total, but on a per student basis – and these resources will be adjusted as school size decreases to ensure that every school can meet the needs of its students, regardless of its size.

With that in mind, this chapter explains how the base resource recommendations are used to calculate the adequate level of funding needed on a per student basis, as well as adjustments for student need and school characteristics, including size. All estimates are for the 2019-20 fiscal year.

Base Cost

Personnel FTE Calculations

The following table summarizes the recommendations from the prior chapter for the base representative elementary and secondary schools. The elementary school is 300 students and the secondary is 1,000 students; both school sizes represent larger schools in Wyoming and are the base, or floor, level from which a size adjustment would be applied to account for additional resources needed on a per student basis as school size decreases. Note, since resources recommended for middle and high schools were the same, the more generic secondary school label is used to represent both.

Table 6.1
Personnel Resources at Base Level

Personnel ***(student-to-FTE ratios unless otherwise noted)***	**Elementary School, 300 students**	**Secondary School, 1,000 students**
Core Teachers	18	23
Elective Teachers	20% of core teachers	33% of core teachers
Instructional Facilitators	20	20
Tutors/Interventionists	300	400
Librarian/ Media Specialists (up to 1.0 FTE)	300	300
Instructional Aides	350	350
Certified Student Support Staff	200	200
Nurses (up to 1.0 FTE)	750	750
Principals (total FTE)	1.0	1.0
Assistant Principals (total FTE based upon 500:1 starting at 500 ADM)		2.0
Secretaries (total FTE)	1.0	1.0
Clerks	200	200
IT Technicians	250	250
Substitute Cost per ADM	$107	$93

The cost for substitutes is based upon the recommended 15 days per core and elective teacher at a daily rate of $106.84; applying this to the number of teacher FTEs generated at the representative school sizes results in the per ADM figure shown. Based upon the above resource ratios (or FTEs where noted), a total number of FTE were generated, to which average salaries were then applied.

Applying Salaries

The study team applied salaries to the generated FTEs in two ways that differ from the current funding approach: using statewide average salaries for all positions and increasing the average teacher salary by $3,900.

The primary reason the study team recommends that staff be resourced based upon statewide average salaries is to be as equitable as possible. Currently, the state adjusts the resources each district receives by a number of district-specific adjustments, including education and experience. In practice, few states provide these types of adjustments and in the study team's experience, this can be an equity issue particularly around teachers. Districts that may have an easier time attracting and retaining high quality teachers are rewarded, while districts that may have a harder time attracting experienced and educated staff do not have the resources to provide additional incentives through alternative compensation systems or additional support for newer, lower paid staff. Further, while providing higher funding for more experienced and educated staff does allow districts to hire the best and brightest, it does not consider that there should be increased efficiency with resources because of higher quality staff, such as the need for less coaching or the ability to take on additional duties or leadership roles.

There is also growing evidence that years of experience and college credits are not good indicators of teacher quality (Rice, 2010; Ladd & Sorensen, 2015), so by including these specific adjustments in the funding model both provides incentives for districts to allocate more resources into cost areas which are not well aligned with teacher quality and student learning. The statewide average accounts for the experience and education premiums in the current system and also provides the flexibility for incorporating alternative pay plans as well, since it is only looking at average overall pay levels without disaggregating for the experience and education components. The RCA provides the necessary adjustment to the statewide average to accounting for price variations among regions.

Finally, salary studies comparing teacher salaries to other occupations and to salaries (both teacher and other occupations) in other states mostly make use of statewide averages, so the resulting state average salary adjusted for these labor market indicators is the best available estimate of a salary level needed to attract and retain teachers in the Wyoming teacher labor market.

Based upon the teacher salary analysis, the study team recommends increasing the average teacher salary used in the model by $3,900 to align with the actual average salary paid in districts. This adjustment results in an average teacher salary of $54,522, which includes 10 days for professional development, and is applied to teachers, instructional facilitators, and tutors/interventionists. Salaries for other positions are the statewide average model salary. The following table presents the salaries used for the cost modeling.

Table 6.2
Salaries

Salaries	Average
Core Teachers	$54,522
Elective Teachers	$54,522
Instructional Facilitators	$54,522
Tutors/Interventionists	$54,522
Librarian/ Media Specialists	$43,501
Instructional Aides	$18,446
Certified Student Support Staff	$50,622
Nurses	$50,622
Principals	$83,072
Assistant Principals	$69,702
Secretarial	$32,410
Clerical	$24,930
IT Technicians	$43,501
Superintendent	$106,893
Assistant Superintendent	$85,514
Business Manager	$72,079
District Other Administrator	$81,036
District Classified	$34,885
District Maintenance Workers and Groundskeepers	$35,776
Custodian	$29,843

The following fringe benefit rates were also applied as well as an amount for health care based upon the state's current calculation methods.

Table 6.3
Salary Fringe Benefits and Health Care Amount per FTE

Salary Fringe Benefits	
Social Security	6.20%
Worker's Compensation	0.70%
Unemployment Insurance	0.06%
WY Retirement System - Employee Share	5.57%
WY Retirement System - Employer Share	7.12%
Health Care Amount	
$16,763.93	

All salaries and benefits are also adjusted by a district's RCA, using the recommended 2018 unadjusted CWI.

Personnel Base Cost

By applying the described average salary and benefit amounts, the study team developed base cost figures for elementary and secondary schools.

Table 6.3

Personnel Base Costs Per Student

	Elementary	Secondary
Personnel salaries, including fringe benefits	*$6,368*	*$5,290*
Health care	*$1,693*	*$1,433*
Total per student	**$8,060**	**$6,723**

These base cost figures are then adjusted for student need and school characteristics, size, and regional cost differences.

Personnel Size Adjustment

The study team recognizes that to provide equity of opportunity for Wyoming students regardless of school size, that difference resource levels on a per student basis will be required. Therefore the study team developed a size adjustment to reflect the differing “economies of scale” experienced by different schools based upon their size. In simpler terms, this means that it can be more costly in small settings and less expensive in larger settings to provide similar services.

To create this size adjustment, the study team implemented the staffing recommendations from the prior chapter at each of the different representative school size points from the professional judgment process, as presented in Chapter 3, as well as additional minimum and maximum points. While many of the staffing resources were recommended consistent regardless of size (such as student support and clerical staff ratios), the study team also considered PJ participant feedback about resources that had either floors or ceilings (such as be provide up to a 1.0 for principals, nurses, librarians), or should be implemented at different ratios (such as smaller student-to-teacher ratios and higher elective-to-core teacher ratios) as school size decreased to support equity of opportunity.

Tables 6.4A and 6.4B on the following pages present the differing resource needs by size.

Table 6.4A

Elementary Personnel Resources by Size

Elementary Resources (student-to-FTE ratio unless otherwise noted)							
School Size	**2**	**8**	**48**	**150**	**210**	**300**	**600**
Core Teachers	2	4	8	17	18	18	18
Elective Teachers			25%	20%	20%	20%	20%
Instructional Facilitators (FTE per # of core teachers)			20	20	20	20	20
Tutors/Interventionists				300	300	300	300
Librarian/ Media Specialists (up to 1.0 FTE)			300	300	300	300	300
Instructional Aides			350	350	350	350	350
Certified Student Support Staff				200	200	200	200
Nurses (up to 1.0 FTE)			750	750	750	750	750
Principals (total FTE)	0.1	0.1	0.5	1.0	1.0	1.0	1.0
Assistant Principals (total FTE)							1.0
Secretaries (total FTE)				1.0	1.0	1.0	1.0
Clerks	2	8	48	200	200	200	200
IT Technicians				250	250	250	250
Substitute Cost per ADM	$801	$401	$250	$113	$107	$107	$107
Elementary Base FTE Generated							
School Size	**2**	**8**	**48**	**150**	**210**	**300**	**600**
Core Teachers	1.0	2.0	6.0	8.8	11.7	16.7	33.3
Elective Teachers			1.5	1.8	2.3	3.3	6.7
Instructional Facilitators			0.3	0.4	0.6	0.8	1.7
Tutors/Interventionists				0.5	0.7	1.0	2.0
Librarian/ Media Specialists			0.2	0.5	0.7	1.0	1.0
Instructional Aides			0.1	0.4	0.6	0.9	1.7
Certified Student Support Staff				0.8	1.1	1.5	3.0
Nurses			0.1	0.2	0.3	0.4	0.8
Principals	0.1	0.1	0.5	1.0	1.0	1.0	1.0
Assistant Principals							1.0
Secretaries				1.0	1.0	1.0	1.0
Clerks	1.0	1.0	1.0	0.8	1.1	1.5	3.0
IT Technicians				0.6	0.8	1.2	2.4

Table 6.5B

Secondary Resources by Size

Elementary Resources (student-to-FTE ratio unless otherwise noted)											
School Size	**2**	**8**	**24**	**32**	**150**	**200**	**300**	**400**	**525**	**1,000**	**1,800**
Core Teachers	2	4	8	8	21	22	23	23	23	23	23
Elective Teachers			40%	40%	33%	33%	33%	33%	33%	33%	33%
Instructional Facilitators (FTE per # of core teachers)					20	20	20	20	20	20	20
Tutors/Interventionists					400	400	400	400	400	400	400
Librarian/ Media Specialists (up to 1.0 FTE)					300	300	300	300	300	300	300
Instructional Aides				350	350	350	350	350	350	350	350
Certified Student Support Staff	200	200	200	200	200	200	200	200	200	200	200
Nurses (up to 1.0 FTE)			750	750	750	750	750	750	750	750	750
Principals (total FTE)	0.1	0.1	0.2	0.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Assistant Principals (total FTE)									1.0	2.0	3.0
Secretaries (total FTE)					1.0	1.0	1.0	1.0	1.0	1.0	1.0
Clerks	2	8	48	64	200	200	200	200	200	200	200
IT Technicians					250	250	250	250	250	250	250
Substitute Cost per ADM	$801	$401	$280	$280	$102	$97	$93	$93	$93	$93	$93
Elementary Base FTE Generated											
School Size	**2**	**8**	**24**	**32**	**150**	**200**	**300**	**400**	**525**	**1,000**	**1,800**
Core Teachers	1.0	2.0	3.0	4.0	7.1	9.1	13.0	17.4	22.8	43.5	78.3
Elective Teachers	0.0	0.0	1.2	1.6	2.4	3.0	4.3	5.8	7.6	14.5	26.1
Instructional Facilitators					0.4	0.5	0.7	0.9	1.1	2.2	3.9
Tutors/Interventionists					0.4	0.5	0.8	1.0	1.3	2.5	4.5
Librarian/ Media Specialists					0.5	0.7	1.0	1.0	1.0	1.0	1.0
Instructional Aides				0.1	0.4	0.6	0.9	1.1	1.5	2.9	5.1
Certified Student Support Staff	0.01	0.04	0.1	0.2	0.8	1.0	1.5	2.0	2.6	5.0	9.0
Nurses			0.0	0.0	0.2	0.3	0.4	0.5	0.7	1.0	1.0
Principals	0.1	0.1	0.2	0.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Assistant Principals									1.0	2.0	3.0
Secretaries					1.0	1.0	1.0	1.0	1.0	1.0	1.0
Clerks	1.0	1.0	0.5	0.5	0.8	1.0	1.5	2.0	2.6	5.0	9.0
IT Technicians					0.6	0.8	1.2	1.6	2.1	4.0	7.2

Using the same process of applying salaries and benefits to the generated FTEs at each school size resulted in differing per student cost figures shown in Table 6.5A and 6.6B.

Table 6.5A
Varying Per Student Elementary Costs by Size

School Size	Personnel Costs per Student, including Heath Care
2	$71,542
8	$28,435
48	$16,352
150	$8,983
210	$8,308
300	**$8,060**
600	$7,824

As shown, the personnel costs per student varied widely by school size, ranging from 97 percent of the base cost of $8,060 in the largest school as efficiency increased slightly, to nearly nine times the base cost in the smallest school.

Table 6.5B
Varying Per Student Secondary Costs by Size

School Size	Personnel Costs per Student, including Heath Care
2	$71,932
8	$28,825
24	$17,219
32	$17,209
150	$8,267
200	$7,726
300	$7,206
400	$7,004
525	$7,052
1,000	**$6,816**
1,800	$6,640

Similarly, costs varied at the secondary level, again at about 97 percent of the base at the largest setting and the same per student cost at the smaller settings (but more than ten times the lower secondary base amount).

These per student personnel costs were then plotted against their enrollment to develop a size adjustment curve, presented in charts 6.1A and 6.2B.

Chart 6.1A
Elementary Size Adjustment Formula

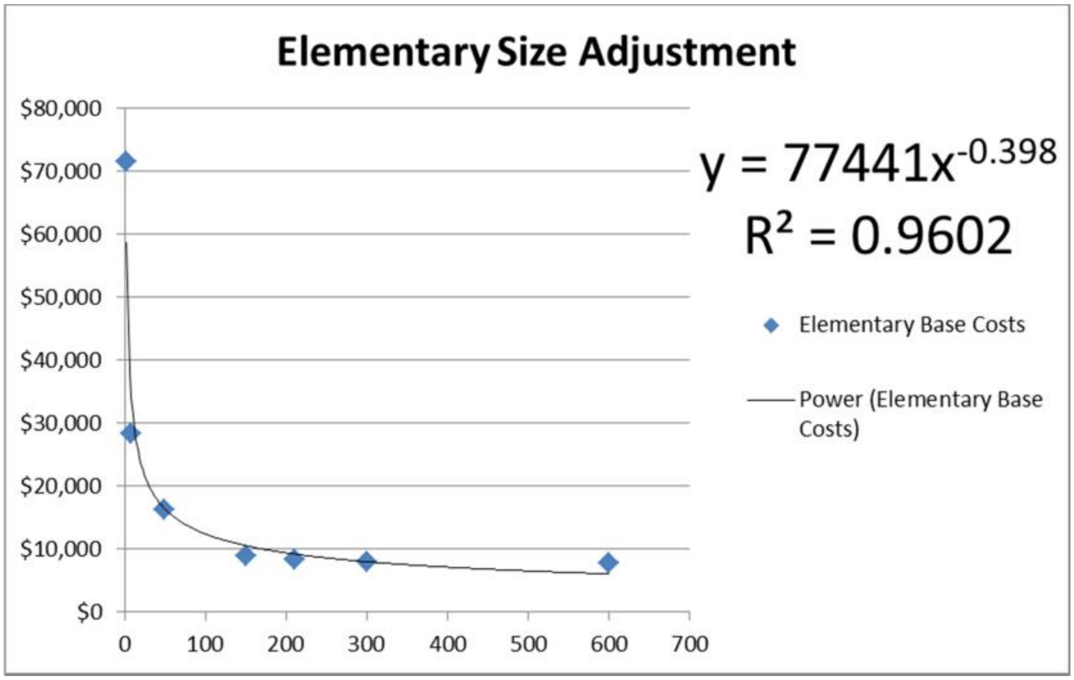
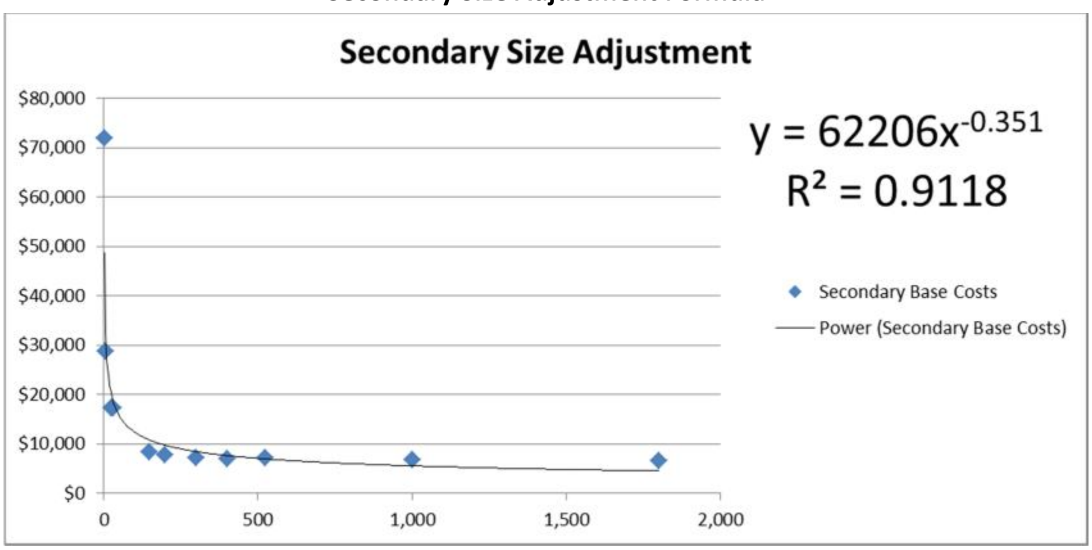


Chart 6.1B
Secondary Size Adjustment Formula



In both charts, plotting the per student personnel costs figure results in what's referred to as a "J curve," meaning that as the size of a school decreases the costs steadily increase, with an exponential increase in the smallest grades. Each chart shows this curve and the best fit equation that generates it. It also includes the R^2 value for each as a measure of how well the equation fits the data; the closer to 1.0 the better the fit. Each equation is a good fit for the underlying data and a solid estimation of the relationship between resource needs and size.

Based upon these size curve formulas, size adjustment factors were created, one for elementary grades and one for secondary grades, by applying the equation and dividing by the base amount. The table below presents the size adjustment factor for different elementary and secondary schools as well as the per student cost figure they generate. Note that the study team recommends setting the lowest size adjustment factor to .97, or 97 percent of the base to reflect the lowest data point at schools larger than the base.

Table 6.7
Size Adjustment Factors and Resulting Per Student Figures

School Size	Elementary Size Adjustment Factor	Elementary Per Student	Secondary Size Adjustment Factor	Secondary Per Student
2	7.29	$58,771	7.16	$48,772
5	5.06	$40,811	5.19	$35,358
10	3.84	$30,972	4.07	$27,722
25	2.67	$21,508	2.95	$20,098
50	2.03	$16,322	2.31	$15,758
100	1.54	$12,387	1.81	$12,355
200	1.17	$9,401	1.42	$9,687
300	0.99	$8,000	1.23	$8,402
400	0.97	$7,818	1.11	$7,595
500	0.97	$7,818	1.03	$7,023
600	0.97	$7,818	0.97	$6,611
1,000	0.97	$7,818	0.97	$6,611
1,200	0.97	$7,818	0.97	$6,611
1,500	0.97	$7,818	0.97	$6,611
1,800	0.97	$7,818	0.97	$6,611

The study team also recommends setting the minimum school amount at the total amount generated by 2 ADM.

Calculating a School's per Student Personnel Base Cost Figure

For each elementary and secondary school the following calculation is made to determine its base cost figure:

Personnel Base Cost (Benefits and Salaries) x Size Adjustment (based upon total school ADM) x RCA

+

Health Care Base Cost Amount x Size Adjustment (based upon total school ADM)
= School's Personnel Base Cost

The elementary base cost and size adjustment are applied to all elementary school ADM and the secondary base cost and size adjustment are applied to all middle and high school ADM. For schools that have ADM in more than one grade band, the weighted average of the elementary and secondary base cost is used. For K-12 schools and collocated schools, the size adjustment is applied based upon the

ADM in each grade band. The RCA is only applied to the portion of the base cost attributed to salaries and benefits, and is not applied to the health care amount.

The school's base cost amount is then multiplied by its total ADM to generate a total personnel base cost amount.

Special Needs Adjustments

At-Risk and ELL

The study team's recommendation is to apply a 0.30 weight to the unadjusted per student base cost to provide the additional supports and services these students need to be successful. This weight is applied to the unadjusted base cost amount and then the total is weighted by a school's RCA.

Applying either weight would be done in the following manner:

Per Student Personnel Base Cost x 0.30 weight x Regional Cost Adjustment

= School's Per Student At-Risk or ELL Amount

This amount would be then multiplied by either the school's at-risk or ELL count to generate a total amount of funding for each group.

CTE

The study team recommends expanding current CTE funding to ensure that more students can access these opportunities. Currently, funding is provided based upon students enrolled in specific, state approved course sequences. Instead, the study team recommends providing supplies and materials funding for all middle school students to offer exploratory classes, then both supplies and materials and FTE at the high school level, based upon the total number of high school students. These additional high school FTE would be in addition to FTE generated through the recommended elective teacher resourcing level. Given stakeholder feedback and the state's emphasis on postsecondary and workforce readiness, including additional requirements around computer science, the study team believes this additional staffing, while not a part of the current Funding Model, would be an important change. Given that this is not currently in the block grant, the state could consider funding it separately either as a categorical or a reimbursement for schools and districts that document the expanded CTE opportunities they are offering.

CTE resources for middle school would be generated in the following manner:

CTE Middle School Supplies and Materials Amount ($25) x Middle School ADM

= Total Middle School CTE Amount

CTE resources for high school would be calculated as:

(High School ADM/400) x Teacher Cost (salaries and benefits, adjusted by RCA + health care amount)

+

CTE High School Supplies and Materials Amount ($100) x High School ADM

= Total High School CTE Amount

CTE amounts are not adjusted for school size.

Gifted and Talented

Resources for would be provided through a $40 per student amount for supplies and materials, as such it is not adjusted by the RCA. It is also not adjusted by size.

Special Education

The study team recommends and modeled the current reimbursement approach to funding special education and costs are estimated using the state's projections.

Non-Personnel Costs

Non-personnel costs are also resourced, including supplies and materials, assessment, technology hardware, professional development and student activities. The study team recommends that supplies and materials and professional development be adjusted by the ECA. The study team is recommending discontinuing assessment funding after a period of three years once districts are able to gather longitudinal data from the new assessment system and as such does not recommend adjusting by the ECA. Technology hardware costs on a per student basis have been fairly stable, or even declining as hardware items decrease in price, so the study team also does not recommend adjusting technology hardware by the ECA.

Instructional Non-Personnel Costs

For instructional non-personnel costs, the following base amounts are used and applied to the total ADM for a school:

Table 6.6

Instructional Non-Personnel Costs, Per District ADM

Instructional Non-Personnel Costs	
Supplies and Materials per ADM (to be adjusted based upon district size)	$221
Assessment per ADM	$25
Technology Hardware per ADM	$250
Professional Development per ADM	$125

Based upon the study team's review of instructional supplies and materials amounts currently expended by districts as reporting in the 2016-17 CREWR report, the study team also developed a size adjustment to be applied to the supplies and materials amount using the same approach described for the personnel size adjustment.

Table 6.7
Supplies and Materials Size Adjustment and Per Student Amounts

District Size	Supplies and Materials Adjustment Factor	Per Student
100	3.53	$670
500	2.08	$396
1,000	1.66	$316
3,000	1.16	$220
5,000	1.00	$190
10,000	1.00	$190
15,000	1.00	$190

Student Activities

For student activities, the study team used the state's current approach for funding elementary activities at $23.79 per Elementary ADM, then middle school and high school activities funding based upon the size of the school; generated per student amounts range from $202 to $783 per middle school ADM, and between $595 and $2,017 per high school ADM.

District Resources

Personnel and District Miscellaneous Costs

For district resources, the study team used the current Funding Model approach to resource central office personnel (using average salaries, adjusted by the district's RCA) and district miscellaneous expenditures. Table 6.9 identifies these resource levels.

Table 6.8
District Resources

Central Office Personnel	Parameters
District Size Staffing Level 500 ADM or Less - Minimum	500
District Size Staffing Level 1,000 ADM - Additional FTEs	1,000
District Size Staffing Level 3,500/4,000 ADM - Additional FTEs	3,500
Professional Staff (minimum @ 500 ADM or less)	3.0
Professional Staff (@ 1,000 ADM)	4.0
Professional Staff (@ 3,500/4,000 ADM)	8.0
Clerical Staff 500 ADM or Less - (minimum)	3.0
Clerical Staff (@ 1,000 ADM)	4.0
Clerical Staff (@ 3,500/4,000 ADM)	10.0
District Misc. Costs	
$366 per ADM for District Misc. Costs	

Maintenance and Operations

The study team used the state's current approach to funding maintenance and operations, with the following adjustments:

1. Allowances based on teacher FTE were based upon an assumed staffing level from the base staffing ratio recommendations.
2. Utilities were funded based upon a three year average of actual expenditures. This three year average should be fixed until the next recalibration.
3. Average salaries for each position (custodian, maintenance and groundskeepers) were used.
4. Allowable square footage for buildings built after 2002 through the state's program was adjusted to actual less enhancements.

Transportation

While the study team recommends moving to a density formula over time, for estimation purposes in this report, transportation funding is modeled using the state's revised approach to funding on a three-year average of actual district expenditures from 2014-15, 2015-16, and 2016-17. The state's current estimates for bus purchasing and reimbursement and isolation and mileage/maintenance payments is also used.

Other Reimbursements and Adjustments

Finally, the study team's cost modeling also includes the state's estimates for other allowable reimbursements, including tuition and teacher extra compensation.

Cost Estimates for Recalibrated Funding Model Recommended

Table 6.8 provides the statewide cost estimate for the recalibrated funding model recommended.

Table 6.8
Estimates for FY 2019-20 of Recommended Model

(shown in millions, unless otherwise noted)	
School Level Instructional Resources	$983.9
Central Office Resources	$87.1
Routine Maintenance & Operations Resources	$94.7
Utilities	$37.2
Reimbursements (including Transportation and Special Education)	$341.7
First Year Charter School Adjustment	$0
Foundation Program Block Grant Guarantee	**$1,544.5**
Foundation Program Block Grant Guarantee Per ADM *(92,369 ADM projected)*	**$16,721**

Overall, for 2019-20, the study team recommends a total foundation program guarantee of $1,544 million. Differences from the current Funding Model are primarily due to increased funding for at-risk and ELL students, expanded CTE opportunities, and adjusting resources to account for school size and better support equity of opportunity. Table 6.9 provides disaggregates school level instructional resources by base personnel and salaries, health care, funding for special needs students, instructional non-personnel costs and student activities.

Table 6.8

Estimates for FY 2019-20 of Recommended Model, Detail on School Level Instructional Resources

(shown in millions, unless otherwise noted)	
School Level Instructional Resources	**$983.9**
Base Personnel and Salaries	*$621.7*
Health Care	*$161.6*
At-Risk	*$87.8*
ELL	*$8.6*
CTE	*$8.7*
Gifted and Talented	*$3.7*
Instructional Non-Personnel Costs	*$61.6*
Student Activities	*$30.0*

It should be noted that health care is a large component of the school-level resources identified. While the study team has recommended continuing the state's current approach to calculating health care this is an area that could be further explored to reduce costs, such as through a reimbursement approach instead of including it as part of the foundation block grant.

Finally, Table 6.9 on the following page provides the information from Table 6.7 by district.

Table 6.9

Estimates for FY 2019-20 of Recommended Model by District

	ADM	School Level Resources	Central Office Resources	Routine Maintenance & Operations Resources	Utilities	Transportation, Special Education, & Other Reim.	Total Foundation Program Guarantee	Total Foundation Program Guarantee per ADM
Albany #1	3,966	$37,790,000	$3,110,000	$3,370,000	$1,380,000	$15,200,000	$60,850,000	$15,344
Big Horn #1	1,028	$11,870,000	$1,060,000	$1,100,000	$410,000	$3,700,000	$18,140,000	$17,640
Big Horn #2	707	$7,570,000	$840,000	$920,000	$270,000	$2,390,000	$11,990,000	$16,953
Big Horn #3	496	$6,090,000	$690,000	$610,000	$250,000	$2,710,000	$10,350,000	$20,884
Big Horn #4	279	$3,650,000	$610,000	$380,000	$180,000	$2,010,000	$6,830,000	$24,459
Campbell #1	8,677	$94,980,000	$7,460,000	$8,340,000	$3,160,000	$34,550,000	$148,490,000	$17,114
Carbon #1	1,793	$19,730,000	$1,630,000	$1,700,000	$1,050,000	$6,020,000	$30,130,000	$16,803
Carbon #2	619	$9,900,000	$810,000	$1,580,000	$540,000	$3,500,000	$16,330,000	$26,376
Converse #1	1,690	$19,210,000	$1,640,000	$2,290,000	$930,000	$9,860,000	$33,930,000	$20,081
Converse #2	607	$8,300,000	$850,000	$870,000	$400,000	$2,220,000	$12,640,000	$20,822
Crook #1	1,135	$13,450,000	$1,160,000	$1,700,000	$420,000	$4,950,000	$21,680,000	$19,108
Fremont # 1	1,760	$16,860,000	$1,570,000	$2,150,000	$860,000	$7,420,000	$28,860,000	$16,396
Fremont # 2	149	$2,670,000	$580,000	$370,000	$230,000	$750,000	$4,600,000	$30,927
Fremont # 6	407	$5,760,000	$670,000	$740,000	$220,000	$2,130,000	$9,520,000	$23,402
Fremont #14	617	$7,340,000	$790,000	$1,220,000	$360,000	$3,420,000	$13,130,000	$21,269
Fremont #21	497	$6,190,000	$700,000	$820,000	$210,000	$2,520,000	$10,440,000	$20,988
Fremont #24	389	$4,870,000	$660,000	$640,000	$160,000	$2,120,000	$8,450,000	$21,749
Fremont #25	2,449	$24,180,000	$2,040,000	$2,370,000	$990,000	$10,340,000	$39,920,000	$16,300
Fremont #38	437	$5,170,000	$680,000	$590,000	$260,000	$3,780,000	$10,480,000	$23,963
Goshen #1	1,704	$19,590,000	$1,510,000	$1,960,000	$900,000	$7,500,000	$31,460,000	$18,467
Hot Springs #1	663	$7,430,000	$810,000	$980,000	$440,000	$3,220,000	$12,880,000	$19,430
Johnson #1	1,270	$13,850,000	$1,240,000	$2,500,000	$550,000	$4,100,000	$22,240,000	$17,516
Laramie #1	13,860	$134,990,000	$11,080,000	$10,720,000	$5,270,000	$41,920,000	$203,980,000	$14,717
Laramie #2	1,035	$12,660,000	$1,120,000	$1,240,000	$420,000	$5,000,000	$20,440,000	$19,744
Lincoln #1	604	$7,260,000	$810,000	$980,000	$470,000	$2,530,000	$12,050,000	$19,957
Lincoln #2	2,840	$28,520,000	$2,380,000	$2,880,000	$950,000	$11,190,000	$45,920,000	$16,170
Natrona #1	12,798	$127,180,000	$10,370,000	$9,880,000	$3,880,000	$42,880,000	$194,190,000	$15,173
Niobrara #1	818	$7,950,000	$890,000	$710,000	$260,000	$2,530,000	$12,340,000	$15,079

	ADM	School Level Resources	Central Office Resources	Routine Maintenance & Operations Resources	Utilities	Transportation, Special Education, & Other Reim.	Total Foundation Program Guarantee	Total Foundation Program Guarantee per ADM
Park # 1	1,809	$18,140,000	$1,640,000	$1,670,000	$660,000	$5,640,000	$27,750,000	$15,336
Park # 6	2,038	$19,230,000	$1,800,000	$1,740,000	$760,000	$7,690,000	$31,220,000	$15,317
Park #16	119	$2,420,000	$590,000	$300,000	$100,000	$640,000	$4,050,000	$33,981
Platte #1	1,008	$13,400,000	$1,100,000	$1,290,000	$630,000	$4,750,000	$21,170,000	$21,009
Platte #2	241	$3,760,000	$640,000	$480,000	$140,000	$900,000	$5,920,000	$24,578
Sheridan #1	936	$11,570,000	$1,040,000	$1,630,000	$400,000	$2,160,000	$16,800,000	$17,945
Sheridan #2	3,496	$32,420,000	$2,790,000	$2,960,000	$980,000	$8,940,000	$48,090,000	$13,757
Sheridan #3	96	$2,270,000	$570,000	$250,000	$80,000	$560,000	$3,730,000	$39,039
Sublette #1	1,048	$12,780,000	$1,240,000	$1,340,000	$510,000	$4,130,000	$20,000,000	$19,083
Sublette #9	567	$8,370,000	$870,000	$1,140,000	$500,000	$2,170,000	$13,050,000	$23,013
Sweetwater #1	5,560	$62,520,000	$4,790,000	$5,010,000	$1,890,000	$19,450,000	$93,660,000	$16,846
Sweetwater #2	2,623	$29,440,000	$2,390,000	$2,900,000	$1,380,000	$9,950,000	$46,060,000	$17,563
Teton #1	2,819	$31,040,000	$2,480,000	$2,550,000	$740,000	$9,960,000	$46,770,000	$16,591
Uinta #1	2,716	$27,460,000	$2,260,000	$2,600,000	$1,010,000	$8,300,000	$41,630,000	$15,328
Uinta #4	836	$8,100,000	$960,000	$1,010,000	$340,000	$2,900,000	$13,310,000	$15,921
Uinta #6	728	$7,820,000	$890,000	$1,060,000	$450,000	$2,690,000	$12,910,000	$17,736
Washakie #1	1,309	$13,720,000	$1,270,000	$1,430,000	$510,000	$5,630,000	$22,560,000	$17,239
Washakie #2	107	$2,150,000	$560,000	$260,000	$100,000	$400,000	$3,470,000	$32,381
Weston #1	765	$8,510,000	$880,000	$930,000	$400,000	$3,060,000	$13,780,000	$18,007
Weston #7	256	$3,710,000	$600,000	$560,000	$200,000	$1,270,000	$6,340,000	$24,774
Total	**92,369**	**$983,840,000**	**$87,120,000**	**$94,720,000**	**$37,200,000**	**$341,650,000**	**$1,544,530,000**	**$16,721**

Appendix A: Professional Judgment Panel Participants

Name	District	Role
Alan Demaret	Sweetwater 2	Special Education Administrator
Amanda Ysen	Fremont 2	Business Manager
Andrea Wood	Crook 1	Teacher
Boyd Brown	Campbell 1	Superintendent
Brandon Crosby	Campbell 1	Principal
Breez Daniels	Hot Springs 1	Principal
Brent Notman	Converse 1	Principal
Brett Dahl	Sheridan 2	Principal
Brian Cox	Laramie 1	Principal
Brian Doner	Natrona 1	Principal
Bruce Toren	Fremont 24	Superintendent
Charles Auzqui	Sheridan 3	Superintendent
Cheryl Junge	Natrona 1	Teacher
Dirk Andrews	Natrona 1	Teacher
Don Dihle	Campbell 1	Business Manager
Ed Goetz	Albany 1	Business Manager
Eric Makelky	Sublette 1	Principal
Fred George	Laramie 1	Principal
Gerry Chase	Johnson 1	Superintendent
Gillian Chapman	Teton 1	Superintendent
Grady Hutcherson	Goshen 1	Teacher
Greg Legerski	Sublette 1	Principal
Greg Rohrer	Sheridan 3	Business Manager
J.P. Denning	Laramie 1	Special Education Administrator
Janet Collen	Washakie 2	Business Manager
Jaraun Dennis	Uinta 1	Technology Specialist
Jason Sleep	Park 1	Principal
Jay Curtis	Park 1	Superintendent
Jeremy Smith	Sheridan 1	Business Manager
Jimmy Phelps	Washakie 2	Superintendent
Joel Kuper	Big Horn 3	Teacher
John Fabela	Park 1	Teacher
Jubal Yinnie	Albany 1	Superintendent
Julie Hornby	Natrona 1	Principal
Kathy Vetter	Platte 1	Teacher
Kay Watson	Fremont 24	Business Manager
Name	**District**	**Role**

Ken Crowson	Fremont 38	Superintendent
Kim Amen	Laramie 1	Teacher
Kirby Eisenhauer	Campbell 1	Business Manager
Kirk Schmidt	Fremont 21	Business Manager
Lannette Lahey	Fremont 1	Teacher
Leonard Abernathy	Fremont 25	Teacher
Leslie Voxland	Fremont 1	Principal
Lu Beecham	Fremont 25	Business Manager
Mark Chollak	Sweetwater 1	Teacher
Marty Gale	Fremont 2	Superintendent
Marty Kobza	Sheridan 1	Superintendent
Marty Wood	Niobrara 1	Principal
Mary Jo Lewis	Park 1	Business Manager
Melissa Harris	Natrona 1	Teacher
Michael Wiggam	Laramie 1	Business Manager
Mike Hamel	Carbon 1	Superintendent
Peggy Monteith	Park 6	Special Education Administrator
Rebecca Adsit	Sheridan 2	Principal
Rick Woodford	Big Horn 2	Superintendent
Roxie Taft	Sheridan 2	Business Manager
Sally Wells	Carbon 2	Business Manager
Shane Ogden	Park 16	Superintendent
Shannon Harris	Natrona 1	Principal
Shon Hocker	Big Horn 1	Superintendent
Steve Carroll	Laramie 1	Teacher
Teresa Chaulk	Lincoln 1	Business Manager
Tracy Turnell-Thomas	Park 16	Business Manager
Travis Dunkan	Park 6	Teacher
Travis Sweeney	Fremont 1	Business Manager

Appendix B: Summary of Wyoming's Educational Program and Related Requirements

The following document offers a brief overview of the Educational Program in Wyoming, often referred to as the "basket of educational goods and services" and related requirements such as content standards, graduation requirements, accountability and accreditation. All language is from the Wyoming Department of Education, Wyoming State Board of Education or the Legislative Services Office.

Basket of Educational Goods and Services[16]

By law, the Legislature has established a basket of educational goods and services constituting the proper education to which Wyoming students are entitled, including a common core of knowledge and skills.

Common Core of Knowledge

13. Reading/language arts
14. Social Studies
15. Mathematics
16. Science
17. Fine arts/performing arts
18. Physical education
19. Health and safety
20. Humanities
21. Career/vocational education
22. Foreign cultures & languages
23. Applied technology
24. Government and civics including state and federal constitutions

Common Core of Skills

7. Problem solving
8. Interpersonal communications
9. Keyboarding and computer applications
10. Critical thinking
11. Creativity
12. Life skills, including personal financial management skills

The Common Core of Knowledge and Common Core of Skills are implemented through the Wyoming Content and Performance Standards by grade level developed by the State Board of Education in consultation and coordination with local school districts. The Wyoming Content and Performance Standards are in nine content areas: Language Arts, Mathematics, Science, Social Studies, Fine and

[16] W.S. 21-9-101(b)

Performing Arts, Foreign Language, Health Education, Physical Education, and Career/Vocational Education.

Special Needs Students[17]

The basket of educational goods and services is also required to include programs designed to address the special needs of identified student populations, including:

- students with disabilities (special education programs);
- economically disadvantaged students;
- students with limited English proficiency: and
- gifted and talented students.

Schools and districts must also meet federal requirements for these students.

All basket components are "implemented and enforced by rule and regulation of the State Board of Education, to be of sufficient quality to prepare students for future post-secondary education or employment opportunities and participation as citizens." Successful completion of content standards is measured through performance on state and district assessments and mandatory graduation requirements.[18] Further, the state accountability and accreditation systems hold schools and districts accountable for providing students equal access to a quality education –as defined by the basket of educational goods and services- no matter where they live.[19]

Assessments

State Assessment System[20]

Starting in spring 2018, the current Proficiency Assessment for Wyoming (PAWS) will no longer be administered. The Wyoming Test of Proficiency and Progress (WY-TOPP) will be used in school year 2017-2018, with future assessments from American Institutes for Research (AIR) and ACT.

The 2017-2018 State Assessment System includes:

- **Wyoming Test of Proficiency and Progress (WY-TOPP) Assessments:** The WY-TOPP interim assessments in reading and mathematics are administered in fall for grades 3-10, in winter for grades 1-10, and in spring for grades K-2. The WY-TOPP science assessment is administered in grades 4, 8, and 10. The WY-TOPP writing assessment is administered in grades 3, 5, 7, and 9. The WY-TOPP summative assessments are administered late-spring in grades 3-10.

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[17] W.S. 21-9-101(c)
[18] Legislative Service Office
[19] State Board of Education
[20] Wyoming Department of Education, "State Assessment System," https://edu.wyoming.gov/educators/state-assessment/

- **WY-Alternate (WY-ALT):** given once per year to students with significant cognitive disabilities in grades 3-11 in ELA and mathematics and in grades 4, 8-11 in science.
- **ACT:** given once a year to all students in the grade 11.
- **WorkKeys**: an optional assessment for students in grades 11 and 12.
- **ACCESS for ELLs®:** required once per year with all students who are English language learners. It assesses students' progress in attaining English proficiency. An alternate ACCESS is also available for English language learners who also have significant cognitive disabilities.

District Assessment System[21]

The purpose of the K-12 District Assessment System (DAS) is to ensure equity of opportunity for Wyoming students by demonstrating alignment of district assessments to the Wyoming Content and Performance Standards in all nine content areas. The DAS should be designed and implemented so that inferences pertaining to equity of educational opportunity are supported by outcomes as measured by the assessment system. State-required assessments, district assessments, school assessments, and classroom assessments are all included under the umbrella of the overall district assessment system.

Graduation Requirements and Hathaway Scholarship Levels

Graduation Requirements[22]

The State Board of Education, in consultation with local school districts, is required to establish graduation standards within the Wyoming Content and Performance Standards for graduation from any high school. At minimum, the graduation standards shall require the successful completion of:

- Four school years of English;
- Three school years of mathematics;
- Three school years of science;
- Three school years of social studies, including history, American government, and economic systems and institutions.

Additional graduation requirements for each of the Wyoming Content and Performance Standards are identified in the State Board of Education's rules and regulations.

Hathaway Scholarship Program Levels[23]

Hathaway scholarships are designed to provide an incentive for Wyoming students to prepare for and pursue post-secondary education within Wyoming. The program consists of four separate merit scholarships, each with specific eligibility requirements:

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[21] Wyoming Department of Education, "District Assessment System," https://edu.wyoming.gov/educators/district-assessment/

[22] Wyoming Department of Education, Chapter 31, "Wyoming Graduation Requirements"

[23] Wyoming Department of Education, "Hathaway Scholarship Requirements," https://edu.wyoming.gov/beyond-the-classroom/college-career/scholarships/hathaway/requirements/

Provisional Opportunity

- Course Requirements: Meeting current graduation requirements in Language Arts, Math, Science, and Social Studies, and two years of either fine arts, career and technical education (CTE), or two years of foreign language
- Achievement Benchmarks: 2.5 GPA and 17 on ACT

Opportunity

- Course Requirements: four years of Language Arts, Math, and Science, three years of Social Studies, and two years of either fine arts, CTE, or additional foreign language
- Achievement Benchmarks: 2.5 GPA and 19 on ACT

Performance

- Course Requirements: same requirements as Opportunity, plus two years of foreign language
- Achievement Benchmarks: 3.0 GPA and 21 on ACT

Honors

- Course Requirements: same requirements as Performance
- Achievement Benchmarks: 3.5 GPA and 25 on ACT

Accountability[24]

State-Level

During the 2011 General Session, the Wyoming Legislature embarked on an ambitious agenda to reform the ways in which Wyoming schools, educators, and students were held accountable for academic performance. The Legislature established the Wyoming Accountability in Education Act (WAEA), which was designed in two phases. Phase one created a comprehensive accountability framework so major accountability and assessment initiatives would work together coherently to best improve Wyoming's educational accountability system. Phase two implements an educator accountability system. With the implementation of the WAEA, a statewide system of support has also been established to assist schools and educators with the primary goal of improving academic performance.

There are several stated goals of the WAEA. These goals are intended to achieve the following:

- See Wyoming become a national education leader among states;
- Ensure all students leave Wyoming schools career or college ready;
- Recognize student growth and increase the rate of that growth for all students;
- Recognize student achievement and minimize achievement gaps;
- Improve teacher, school, and district leader quality.
- Maximize efficiency of Wyoming education; and
- Increase credibility and support for Wyoming public schools.

[24] Wyoming Department of Education, "Accountability Overview," https://edu.wyoming.gov/educators/accountability/state-school-accountability/

Per the 2017 Wyoming School Performance Rating Model guide, WAEA evaluates school performance by considering the following indicators:[25]

<u>Indicators for Schools that have Grades Three through Grade Eight</u>

- Achievement: the achievement indicator score for schools is the percent of proficient or above test scores in all three tested content areas on the state summative assessment (reading in grades 3-8, math in grades 3- 8, and science in grades 4 and 8)
- Growth: change in the achievement within students as they progress from year to year, shown as growth percentiles compared to their peers.
- Equity: performance with subgroups of students in order to close achievement gaps; based upon the growth in math and reading of students identified as belonging to a consolidated subgroup at the school.

<u>Indicators for High School</u>

- Academic Performance
    - Achievement: total percent proficient in tested subject area tests of the ACT in grade 11.
    - Growth: year to year change in performance based upon ACT suite of assessments compared to peers; shown in growth percentiles.
    - Equity: performance with subgroups; measured in grade 11.
- Overall Readiness
    - Graduation: based upon the four-year adjusted cohort graduation rate
    - Additional Readiness: a combined score based upon:
        - Tested Readiness: based on composite scores on the grade nine Explore, the grade ten Plan, and the grade eleven ACT.
        - Grade Nine Credits Earned: the percent of prior year first time grade nine students who earned one fourth of the credits required to graduate from the designated high school.
        - Hathaway Scholarship Eligibility: index points are assigned to each student based upon their Hathaway Scholarship Eligibility. The index points associated with each Hathaway scholarship eligibility level: Honors, 100 pts; Performance, 90 pts; Opportunity, 80 pts; Provisional, 70 pts; and Not Eligible, 40 pts. A school's score for the Hathaway scholarship eligibility level is the average of the index points for all prior year graduates from the school.

Based on these indicators, schools receive one of four overall performance ratings: Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations, or Not Meeting Expectations. For schools that have both grade configurations (3-8 and High School) the school's official performance level will be the lower of the two computed performance levels.

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[25] Wyoming Department of Education, "Wyoming School Accountability, 2017 Wyoming School Performance Rating Model."

Under WAEA, schools that are rated as Partially Meeting or Not Meeting Expectations have to submit a school improvement plan which addresses areas that need improvement.

Federal-Level[26]

Federal accountability is transitioning from the requirements of No Child Left Behind (NCLB) to a locally controlled Wyoming accountability system that meets federal guidelines defined in the recently passed Every Student Succeeds Act (ESSA).

ESSA requires annual testing and reporting in reading and math in grades 3-8 and once in grades 10-12, as well as in science once in grade spans 3-5, 6-9, and 10-12. Under ESSA, schools will receive a report card using the same indicators as WAEA.

Schools with a graduation rate below 67% and the bottom 5% of Title I schools will be identified for state-led support. Additionally, schools with a specific student groups in the bottom 10% will be identified for supports and interventions led by the local school and district. This information will be included in the report card.

Accreditation[27]

Wyoming's K-12 schools and districts are annually accredited by the Wyoming State Board of Education. The requirements for accreditation in Wyoming are:

- Accountability: Participation in the Wyoming Accountability System
- School Improvement Plan: Requirements depend on accountability score
- Adherence to Statute: Verified annually through statutory assurances
- Standards: Teaching & assessing Wyoming Content and Performance Standards
- External Review: Review of district practices by AdvancED every five years.

[26] Wyoming Department of Education, "ESSA Fact Sheet."
[27] Wyoming Department of Education "Accreditation."
https://edu.wyoming.gov/educators/accountability/accreditation/

Appendix C: Example of Instructions to PJ Panelists from Statewide Review Panel

INSTRUCTIONS TO WYOMING

PROFESSIONAL JUDGMENT PANEL MEMBERS

Augenblick, Palaich and Associates

Casper, WY
November 2-3, 2017

The work you are doing today is part of a school finance study being conducted in Wyoming on behalf of the Select Committee on School Finance Recalibration. It relies on your professional experience to identify the resources needed so that schools and districts can provide the required educational program, or "basket of educational goods and services," that all Wyoming students are entitled to receive. Below you will find a number of instructions to help you in this process. It is important to remember that you are not being tasked to build your "Dream School." Instead, you are being asked to allocate resources as efficiently as possible without sacrificing quality.

1. You are a member of a panel that is being asked to design how programs and services will be delivered in representative school settings. These panels are being used to identify the resources that schools with a particular set of demographic characteristics should have in order to meet the educational program requirements set by the state.

2. Three school-level professional judgment panels were previously convened to focus on: (1) elementary schools; (2) middle schools; and (3) high schools. Each panel will discussed multiple representative schools for that grade configuration of varying size, and addressed resources needed to serve all students ("base" resources), and "at-risk" students (using free and reduced lunch eligibility as a proxy).

3. Three panels were then held to review the work of prior panels and address the resources needed for (1) special education students, (2) English Language Learners and at-risk students, and (3) Career and Technical Education (CTE) students. An additional panel was held to address the smallest K-12 school/district settings.

4. Today, you are serving on the final statewide review panel. This panel will provide: 1) the final review of the resources identified by all prior panels and address any inconsistencies; 2) identify the additional resources needed at the district-level to support schools; and 3) discuss pricing and any statewide contextual issues.

5. The characteristics of each representative school(s) are identified, including: (1) grade span; (2) enrollment, and (3) the percentage of students in each category.

6. You will be provided a short summary of the state's required educational program, or "basket of educational goods and services," and related requirements, such as content standards, assessments, graduation requirements, Hathaway Scholarship requirements, and the accountability and accreditation systems; it is not meant to be exhaustive, but instead should be considered a refresher or reminder.

7. In designing the representative school(s), we need you to provide some very specific information so that we can calculate the cost of the resources that are needed to fulfill the indicated requirements or objectives. The fact that we need that information should not constrain you in any way in designing the program of the representative school(s). Your job is to create a set of programs, curriculums, or services designed to serve students with particular needs in such a way that the indicated requirements/objectives can be fulfilled. Use your experience and expertise to organize personnel, supplies and materials, and technology in an efficient way you feel confident will produce the desired outcomes.

8. For this process, the following statements are true about the representative school(s) and the conditions in which they exist:

   Teachers: You should assume that you can attract and retain qualified personnel and that you can employ people on a part-time basis if needed (based on tenths of a full-time equivalent person).

   Facilities: You should assume that the representative school has sufficient space and the technology infrastructure to meet the requirements of the program you design.

   Revenues: You should not be concerned about where revenues will come from to pay for the program you design. Do not worry about federal or state requirements that may be associated with certain types of funding. You should not think about whatever revenues might be available in the school or district in which you now work or about any of the revenue constraints that might exist on those revenues.

   Programs: You may create new programs or services that do not presently exist that you believe address the challenges that arise in schools. You should assume that such programs or services are in place and that no additional time is needed for them to produce the results you expect of them. For example, if you create after-school programs or pre-school programs to serve some students, you should assume that such programs will achieve their intended results, possibly reducing the need for other programs or services that might have otherwise been needed.

Appendix D: References

Adelman, N., Haslam, M., & Pringle, B. (1996). *Studies of Education Reform: The Uses of Time for Teaching and Learning.* Washington, DC: U.S. Department of Education. Office of Educational Research and Improvement.

Algozzine, B., Hendrickson, J., Gable, A., & White, R. (1993). Caseloads of Teachers of Students with Behavioral Disorders. *Behavioral Disorders, 18*, 103-109.

Allen, J., Pianta, R., Gregory, A., Mikami, A., & Lun, J. (2011). An Interaction-Based Approach to Enhancing Secondary School Instruction and Student Achievement. *Science, 333(6045)*, 1034-1037.

Angrist, J., & Lavy, V. (1999). Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievment. *Quarterly Journal of Economics, 114(2)*, 533-575.

August, D., & Shanahan, T. (. (2006). *Developing Literacy in Second-Language Learners: Report of the National Literacy Panel on Language Minority Children and Youth.* Mahwah, NJ: Lawrence Erlbaum.

Bishop, J., Worner, W., & Weber, L. (1988). Extending the School Day: An Evaluation of a Seven-Period Class Schedule. *Studies in Educational Evaluation, 14*, 361-380.

Blatchford, P., Bassett, P., & Brown, P. (2011). Examining the Effect of Class Size on Classroom Engagement and Teacher-Pupil Interaction: Differences in Relation to Pupil Prior Attainment and Primary vs. Secondary Schools. *Learning and Instruction, 21*, 715-730.

Blatchford, P., Bassett, P., Goldstein, H., & Martin, C. (2003). Are Class Size Differences Related to Pupils' Educational Progress and Classroom Processes? Findings from the Institute of Education Class Size Study of Children Aged 5-7 Years. *British Educational Research Journal, 29(5)*, 709-730.

Blatchford, P., Goldstein, H., Martin, D., & Browne, W. (2002). A Study of Class Size Effects in English School Reception Year Classes. *British Educational Research Journal, 28(2)*, 169-185.

Bryan, J., Moore-Thomas, C., Day-Vines, N., & Holcomb-McCoy, C. (2011). School Counselors as Social Capital: The Effects of High School College Counseling and Development. *Journal of Counseling and Development, 89(2)*, 190-199.

Carey, J., & Harrington, K. (2010). *Utah Comprehensive Counseling and Guidance Program Evaluation Report.* Amherst, MA: Center for School Counseling Outcome Research.

Carlberg, C., & Kavale, K. (1980). The Efficacy of Special versus Regular Class Placement for Exceptional Children: A Meta-Analysis. *Journal of Special Education, 14*, 295-309.

Carlson, D., Borman, G., & Robinson, M. (2011). A Multistate District-Level Cluster Randomized Trial of the Impact of Data-Driven Reform on Reading and Mathematics Achievement. *Educational Evaluation and Policy Analysis, 33(3)*, 378-398.

Carrell, S., & Carrell, S. (2006). Do Lower Student-to-Counselor Rartios Reduce School Disciplinary Problems? *Contributions to Economic Analysis and Policy, 5(1)*, Article 11.

Carrell, S., & Hoekstra, M. (2014). Are School Counselors an Effective Educational Input? *Economic Letters, 125*, 66-69.

Checkoway, A., Boulay, B., Gamse, B., Caven, M., Fox, L., Kliorys, K., . . . Woodford, M. (2011). *Evaluation of the Expanded Learning Time Initiative: Year Four Integrated Report: 2009-10.* Cambridge, MA: Abt Associates, Inc.

Chetty, R., Friedman, J., Hilger, N., Saez, E., Schanzenbach, D., & Yagan, D. (2010). *How Does Your Kindergarten Classroom Affect Your Earnings? Evidence From Project Star.* Cambridge, MA: National Bureau of Economic Research.

Coates, D. (2003). Education Production Functions Using Instructional Time as an Input. *Education Economics, 11(3)*, 273-292.

Cook, J., & Kaffenberger, C. (1993). Solution Shop: A Solution-Focused Counseling and Study Skills Program for Middle School. *Professional School Counseling, 7(2)*, 116-123.

Cook, P., Dodge, K., Farkas, G., Fryer Jr, R., Guryan, J., Ludwig, J., . . . Steinberg, L. (2014). *The (Surprising) Efficacy of Academic and Behavioral Intervention with Disadvantaged Youth: Results from a Randomized Experiment in Chicago.* Cambridge, MA: National Bureau of Economic Research.

Dee, T., & West, M. (2011). The Non-Cognitive Returns to Class Size. *Educational Evaluation and Policy Analysis, 33(1)*, 23-46..

Dimmitt, C., & Wilkerson, B. (2012). Comprehensive School Counseling in Rhode Island: Access to Services and Student Outcomes. *Professional School Counseling, 16(2)*, 125-135.

Dobbie, W., & Fryer Jr., R. (2011). *Getting Beneath the Veil of Effective Schools: Evidence from New York City.* Cambridge, MA: National Bureau of Economic Research.

Durlak, R., & Weissberg, R. (2007). *The Impact of After-School Programs that Promote Personal and Social Skills.* Chicago, IL: CASEL.

Dynarski, S., Hyman, J., & Schanzenbach, D. (2011). *Experimental Evidence on the Effect of Childhood Investment on Postsecondary Attainment and Degree Completion.* Cambridge, MA: National Bureau of Economic Research.

Elish-Piper, L., & L'Allier, S. (2011). Examining the Relationship between Literacy Coaching and Student Reading Gains in Grades K-3. *Elementary School Journal, 112(1)*, 83-106.

Farbman, D., & Kaplan, C. (2005). *Time for a Change: The Promise of Extended-Time Schools for Promoting Student Achievement.* Boston, MA: Massachusetts 2020.

Finn, J. (2002). Class-Size Reduction in Grades K-3. In A. Molnar, *School Reform Proposals: The Research Evidence* (pp. 15-24). Tempe, AZ: Education Policy Research Unit, Arizona State University.

Finn, J., & Achilles, C. (1999). Tennessee's Class Size Study: Findings, Implications, Misconceptions. *Educational Evaluatio and Policy Analysis, 21(2)*, 97-109.

Finn, J., Gerber, S., & Boyd-Zaharias, J. (2005). Small Classes in the Early Grades, Academic Achievement, and Graduating from High School. *Journal of Educational Psychology, 97(2)*, 214-223.

Fowler, M., Lindemann, L., Thacker-Gwaltney, S., & Invernizzi, M. (2002). *A Second Year of One-on-One Tutoring.* Ann Arbor, MI: University of Michigan School of Education.

Frederickson, P., Ockert, B., & Oosterbeek, H. (2013). Long Term Effects of Class Size. *The Quarterly Journal of Economics, 128(1)*, 249-285.

Gandara, P., & Rumberger, R. (2007). *Definining an Adequate Education for English Learners.* Palo Alto, CA: Stanford University.

Gersten, R., & Dimino, J. (2006). RTI (Response to Intervention): Rethinking Special Education for Students with Reading Difficulties (Yet Again). *Reading Research Quarterly*, 100-108.

Gersten, R., Baker, S., Shanahan, T., Linan-Thompson, S., Collins, P., & Scarcella, R. (2007). *Effective literacy and English language instruction for English learners in the elementary grades.* Washington, DC: U.S. Department of Education, Institute of Education Sciences.

Gewertz, C. (2008). Consensus on Increasing Learning Time Builds. *Education Week, 28*, 14-17.

Goldenberg, C. (2010). Reading Instruction for English Language Learners. In M. Kamil, P. Pearson, E. Moje, & P. Afflerbach, *Handbook of Reading Research, IV.* Newark, DE: International Reading Association.

Goldschmidt, P., Huang, D., & Chinen, M. (2007). *The Long-Term Effects of After-School Programming on Educational Adjustment and Juvenile Crime: A Study of the LA's BEST After-School Program.* Los Angeles, CA: UCLA.

Gordan, E. (2009). 5 Ways to Improve Tutoring Programs. *Phi Delta Kappan, 90(6)*, 440-445.

Gottlieb, J., & Alter, M. (1997). *An Evaluation Study of the Impact of Modifying Instructional Group Sizes in Resource Rooms and Related Service Groups in New York CIty. Final Report.* New York, NY: New York Univeristy School of Education.

Grissmer, D. (1999). Class Size Effects: Assessing the Evidence, its Policy Implications, and Future Research Agenda. *Educational Evaluation and Policy Analysis, 21(2)*, 231-248.

Hakuta, K. (2011). Educating Language Minority Students and Affirming their Equal Rights: Research and Practical Perspectives. *Educational Researcher, 40(4)*, 163-174.

Hurwitz, M., & Howell, J. (2014). Estimating Causal Impacts of School Counselors with Regression Discontinuity Designs. *Journal of Counseling and Development, 92(3)*, 316-327.

Jepsen, C., & Rivkin, S. (2009). Class Size Reduction and Student Achievement: The Potential Tradeoff Between Teacher Quality and Class Size. *Journal of Human Resources, 44(1)*, 223-250.

Kamil, M., Borman, G., Dole, J., Kral, C., Salinger, T., & Torgeson, J. (2008). *Improving Adolescent Literacy: Effective Classroom and Intervention Practices: A Practice Guide.* Washington, DC: U.S. Department of Education. Institute of Education Sciences. National Center for Education Evaluation.

Konstantopoulos, S., & Chung, V. (2009). What Are the Long-Term Effects of Small Classes on the Achievement Gap? Evidence from the Lasting Benefits Study. *American Journal of Education, 116(1)*, 125-154.

Krueger, A., & Whitmore, D. (2001). The Effect of Attending a Small Class in the Early Grades on College-Test Taking and Middle School Test Results: Evidence from Project Star. *Economic Journal, 111*, 1-28.

Krueger, A., & Whitmore, D. (2002). Would Smaller Classes Help Close the Black-White Achievement Gap? In J. Chubb, & T. Loveless, *Bridging the Achievement Gap* (pp. 11-46). Washington, D.C.: Brookings Institution Press.

Ladd, H. F. & Sorensen, L. C. (2015). Do Master's Degrees Matter? Advanced Degrees, Career Paths, and the Effectiveness of Teachers (Brief 11). Washington, D.C.: National Center for Analysis of Longitudinal Data in Education Research, American Institutes of Research.

Lapan, R., Gysbers, N., Bragg, S., & Pierce, M. (2012). Missouri Professional School Counselors: Ratios Matter, Especially in High Poverty Schools. *Professional School Counseling, 16(2)*, 108-116.

Lapan, R., Whitcomb, S., & Aleman, N. (2012). Connecticut Professional School Counselors: College and Career Counseling Services and Smaller Ratios Benefit Students. *Professional School Counseling, 16(2)*, 117-124.

Lauer, P., Akiba, M., Wilkerson, S., Apthorp, H., Snow, D., & Martin-Glenn, M. (2006). Out-of-School time Programs: A Meta-Analysis of Effects of At-Risk Students. *Review of Eduational Research, 76*, 275-313.

Lockwood, J., McCombs, J., & Marsh, J. (2010). Linking Reading Coaches and Student Achievement: Evidence from Florida Middle Schools. *Educational Evaluation and Policy Analysis, 32(3)*, 372-388.

Massachusetts 2020. (2009). *Kuss Middle School: Expanding Time to Accelerate School Improvement.* Boston, MA: Author.

May, H., Gray, A., Gillespie, J., Sirinides, P., Sam, C., Goldsworthy, H., . . . Tognatta, N. (2013). *Evaluation of the i3 Scale-up of Reading Recovery: Year One Report 2011-2012.* Philadelphia, PA: University of Pennsylvania.

Molnar, A., Smith, P., Zahorik, J., Palmer, A., Halbach, A., & Ehrle, K. (1999). Evaluating the SAGE Program: A Pilot Program in Targeted Pupil-Teacher Reduction in Wisconsin. *Educational Evaluation and Policy Analysis, 21(2)*, 165-177..

Patall, E., Cooper, H., & Allen, A. (2010). Extending the School Day or School Year: A Systematic Review of Research (1985-2009). *Review of Educational Research, 80(3)*, 401-436.

Pham, C., & Keenan, T. (2011). Counseling and College Matriculation: Does the Availability of Counseling Affect College Going Decisions Among Highly Qualified First-Generation College- Bound HIgh School Graduates? *Journal of Applied Economics and Business Research, 1(1)*, 12-24.

Philliber, S., Kaye, J., Herrling, S., & West, E. (2002). Preventing pregnancy and improving health care access among teenagers: An evaluation of the Children's Aid Society—Carrera Model. *Perspectives on Sexual and Reproductive Health, 34(5)*, 244-251.

Priscella, M., Little, C., & Weiss, H. (2008). *After School Programs in the 21st Century: Their Potential and What it Takes to Achieve It.* Cambridge, MA: Harvard Graduate School of Education.

Reback, R. (2010). Schools' Mental Health Services and Young Children's Emotions, Behavior, and Learning. *Journal of Policy Analysis and Management, 29(4)*, 698-727.

Renesee, F., Lindholm-Leary, K., Saunders, W., & Christian, D. (2006). *Educating English Language Learners.* New York: Cambridge University Press.

Rice, J. (1999). The Impact of Class Size on Instructional Strategies and the Use of Time in High School Mathematics and Science Courses. *Educational Evaluation and Policy Analysis, 21(2)*, 215-229.

Rice, J. K. (2010). The Impact of Teacher Experience: Examining the Evidence and Policy Implications (Brief 11). Washington, D.C.: National Center for Analysis of Longitudinal Data in Education Research, Urban Institute.

Rothman, T., & Henderson, M. (2011). Do School-Based Tutoring Programs Significantly Improve Student Performance on Standardized Tests? *Research in Middle Level Education, 34(6)*, 1-10.

Seung, W., Ramirez, G., & Cumming, A. (2010). Tutoring Adolescents in Literacy: A Meta-Analysis. *McGill Journal of Eduation, 45(2)*, 219-238.

Shanahan, T. (1998). On the Effectiveness and Limitations of Tutoring in Reading. In *Review of Research in Education, 23* (pp. 217-234). Washington, DC: American Educational Research Association.

Shanahan, T., & Barr, R. (1995). Reading Recovery: An Independent Evaluation of the Effects of an Early Instructional Intervention for At-Risk Learners. *Reading Research Quarterly, 30(4)*, 958-996.

Sink, C., & Stroh, H. (2003). Raising Achievement Test Scores of Early Elemetnary School Students Throught Comprehensive School Counseling Programs. *Professional School Counseling, 6(5)*, 350-364.

Slavin, R. (1996). Neverstreaming: Preventing Learning Disabilities. *Educational Leadership, 53(4)*, 4-7.

Slavin, R., & Cheung, A. (2005). A Synthesis of Research on Language of Reading Instruction for English Language Learners. *Review of Educational Research, 75(2)*, 247-284.

Slavin, R., Madden, N., Calderon, M., Chamberlain, A., & Hennessy, M. (2010). *Reading and Language Outcomes of a Five-Year Randomized Evaluation of Transitional Bilingual Education.* Baltimore, MD.

Torgeson, J. (2004). Avoiding the Devastating Downward Spiral. *American Educator, 28(3)*, 6-19.

U.S. Department of Education, National Center for Education Statistics. (2014). Table 204.20. Number and Percentage of Public School Students Participating in Programs for English Language Learners, by State: Selected Years, 2002-03 through 2012-13. *Digest of Education Statistics*. Washington, DC: Author.

Urquiola, M. (2006). Identifying Class Size Effects in Developing Countries. *The Review of Economics and Statistics, 88(1)*, 171-177.

Vandell, D., Reisner, E., & Pierce, K. (2007). *Outcomes Linked to High-Quality Afterschool Programs: Longitudinal Findings from the Study of romising Practices.* Irvine, CA: Policy Studies Associates.

Vanderburg, M., & Stephens, D. (2010). The Impact of Literacy Coaches: What Teachers Value and How Teachers Change. *Elementary School Journal, 111(1)*, 141-163.

Wasik, B., & Slavin, R. (1993). Preventing Early Reading Failure with One-to-One Tutoring: A Review of 5 Programs. *Reading Research Quarterly, 28*, 178-200.

Wheeler, P. (1987). The Relationship Between Grade Six Test Scores and the Length of the School Day. *Education Research Quarterly, 11(3)*, 10-17.

Wilkerson, K., Perusse, R., & Hughes, A. (2013). Compreshensive School Counseling Programs and Student Achievement Outcomes: A Comparative Analysis of RAMP Versus Non-RAMP Schools. *Professional School Counseling, 16(3)*, 172-184.

AUGENBLICK, PALAICH AND ASSOCIATES

Supplemental Report A

Review of the Current Wyoming Educational Program and Legislative Funding Model

Prepared for the

Select Committee on School Finance Recalibration

By

Augenblick, Palaich and Associates

Final, January 12, 2018

Contents

I. Introduction

This report will focus on the review of Wyoming's Current Educational Program and Legislative Funding Model. The study team conducted a review of Wyoming's current Educational Program, set forth by Wyoming Statute 21-9-101 (the defined "basket of goods and services") and the eligibility requirements of the Hathaway Scholarship Program, as defined in Wyoming Statute 21-16-1307. The study team's curriculum experts from RMC Research conducted an initial analysis of the state's current educational standard compared to other benchmark states. APA also conducted interviews and listening sessions with stakeholders who are knowledgeable about the state's current and needed educational standards, including the Office of the Governor, Department of Education staff, leaders of key educational membership organizations, and educators. An online survey was also administered to gather additional feedback from other educators and the broader community. Recommendations were made based on expert review and feedback from Wyoming stakeholders. These recommendations were presented to the Select Committee in October and are included in this draft report.

Overview of Study Tasks

1A. Research and Cross-State Comparison of the Educational Program, including Hathaway Scholarship Program Requirements

First, two groups of benchmark states were selected: regional and high-performing states. The regional states selected were: Colorado, Montana, Idaho, North Dakota, South Dakota, Nebraska, and Utah. High-performing states were selected based on a number of different data sources for overall K-12 performance and postsecondary and workforce readiness, including:

1. K-12 student performance and rankings using:
    a. 2015 National Assessment of Educational Progress (NAEP) results;
    b. 2015 NAEP results adjusted for demographics;
    c. Ed Week's K-12 Achievement Factor (C or better); and
    d. Ed Next's ranking of state academic standards.
2. Postsecondary and Workforce Readiness indicators using:
    a. Perkins Career and Technical Education data;
    b. Adjusted ACT Composite Score; and
    c. Education Commission of the States College and Career Readiness scoring.

Based on performance across these measures, the following high-performing states were selected by APA and approved by the Select Committee on August 28: Massachusetts, New Hampshire, New Jersey, Indiana, Vermont, and Virginia.

The educational program comparison against these benchmark states then included several components:

1. An overview comparison of the content areas for which each state has standards.
2. A deeper examination of the depth of standards in the subject areas of English language arts, math, and science for each state.
3. A comparison of the requirements of the Hathaway Scholarship program against the graduation requirements of each state.
4. A comparison of the requirements in each state for special needs students, including special education students, English language learners (ELLs), and gifted students.

A summary of this comparison, including recommendations, was provided as part of the October 12–13 Select Committee meeting materials and during discussions at the meeting.

1B. Examination and Analysis of the Current Funding Model

This examination includes a review of each element of the Funding Model; an analysis of how well the current model is aligned with the adequacy recommendations generated from studies of other states in the past 10 years; an equity analysis; and supplemental analyses of several elements of the Funding Model, including: staff salaries, the regional cost and inflation adjustments, transportation, special education, and other factors related to uncontrollable costs for schools and districts, such as size and geographic isolation.

Review of the Current Funding Model

APA's review of Wyoming's current Funding Model consists of: a) a description of the various elements; b) a brief summary of the impact of the *Campbell* Supreme Court decisions on the elements; c) the amount of revenue generated by the major elements (e.g. core teachers, school administration, etc.); d) a comparison of the major elements to the recommendations of other recent adequacy studies; and e) a comparison of Wyoming's funding to those most commonly used in other states. The study team also conducted an equity study of the current system, which is presented in Supplemental Report B. Additional supplemental analyses included:

Teacher Salaries: The study team compared current teacher salaries to: salaries in the funding model, comparable professionals in the state, and teacher salaries in regional states. *See Supplemental Report B.*

Regional Cost Adjustment (RCA): The study team reviewed the current RCA approaches used by the state and the recommendations for the RCA from the 2015 recalibration report. Several of the analyses from the 2015 study were updated, including a state-specific comparable wage index (CWI). *See Supplemental Report B.*

External Cost Adjustment (ECA): The study team reviewed the current ECA and the recommendations for the ECA from the 2015 recalibration report. Several approaches were used to assess the effect of the ECA, including a comparison to alternative indices and to inflation adjusted costs in bordering states. *See Supplemental Report B.*

Special Education: The study team has completed a review of the special education reimbursement funding process and analyzed 10 years of data on special education reimbursements and enrollment by disability type. *See Supplemental Report D.*

Transportation: The study team has completed a review of the transportation reimbursement funding process and analyzed 10 years of data on transportation reimbursements and ridership. This analysis is included in a standalone report on transportation. *See Supplemental Report E.*

1C. Collection of Stakeholder Feedback on Performance of the Educational Program and Funding Model

Stakeholder feedback was gathered through three avenues: interviews, practitioner panels, and an online survey.

<u>One-on-one and small group interviews</u>

Two APA study team members conducted in-person interviews in Cheyenne the week of August 14. Interviews were 1.5 hours long. Interviews with professional associations included three to six representatives, with representation from districts of varying size and from different parts of the state. Overall, nearly 50 individuals participated in these interviews.

These interviews included:

- Office of the Governor: Governor Mead and Policy Director, Mary Kay Hill
- Wyoming Department of Education: Superintendent Balow and staff
- Wyoming State Board of Education
- University of Wyoming, School of Education, Dean Reutzel
- The following Wyoming professional associations:
    - Wyoming Association of Elementary and Middle School Principals
    - Wyoming Association of School Administrators
    - Wyoming Association of School Business Officials
    - Wyoming Association of Secondary School Principals
    - Wyoming Association of Special Education Administrators
    - Wyoming Curriculum Directors Association
    - Wyoming Education Association
    - Wyoming School Boards Association

<u>Practitioner Panels</u>

APA also convened practitioner panels in four locations in the state to gather educator feedback. Between August 14 and 17, practitioner panels were held in Rock Springs, Cody, Buffalo, and Cheyenne.

Two different practitioner sessions were convened at each location: 1) a discussion of the impact of the state's Educational Program and 2) a discussion of the current Funding Model. A total of 178 educators spoke at the sessions, with additional educators, students, parents, and community members in attendance.

Online Survey

Finally, APA conducted an online survey that was open to all, including educators, parents, students, business leaders, and other community members. All questions were asked as open-ended text responses, so respondents were not inhibited in the feedback they shared. Additionally, respondents were not required to answer each question and could instead provide feedback on the question or questions they wanted to address. A total of 1,240 respondents answered one or more survey questions. Forty-eight percent of participants were parents, 44 percent of participants were educators (many noting they were both an educator and a parent/community member), and eight percent were community members, business leaders, students, or others.

Stakeholder Feedback Questions

The following set of stakeholder feedback questions was used in the interviews, practitioner panels, and online survey:

Educational Program

1. What does it mean to be postsecondary and workforce ready in Wyoming?
2. How well does Wyoming's current educational program prepare students to be postsecondary and workforce ready?
    a. Are there any areas or requirements that need to be added or emphasized?
    b. Are there any areas or requirements that are unnecessary or over emphasized?
3. Are all schools or districts able to provide the opportunity for students to meet the requirements of the Hathaway Scholarship program?
4. How well do Wyoming's current requirements for special needs students (special education, ELLs, economically disadvantaged, gifted and talented) support the success of these students?

Funding Model

1. How responsive do you feel the current funding model is to the different needs of students, schools, or districts?
2. Does the current funding model provide the resources needed for schools or districts to offer the required educational program?
3. Do you see any opportunities for costs savings, such as through shared services?
4. Do you have any specific feedback about the current funding model:
    a. Related to the calculation of the base resources?
    b. Related to regional adjustment, external adjustment, or hold harmless?
    c. Related to reimbursements?
    d. Related to recapture or entitlement?

Key themes from interviews, practitioner panels, and the online survey were summarized and presented at the October 12–13 Select Committee meeting. They are included in the final chapter of this report as well.

II. Review of Wyoming's Current Educational Program

Overview

By law, the Legislature has established a basket of educational goods and services constituting the proper education to which Wyoming students are entitled, including a common core of knowledge and skills.

Common Core of Knowledge

- Reading/language arts
- Social studies
- Mathematics
- Science
- Fine arts/performing arts
- Physical education
- Health and safety
- Humanities
- Career/vocational education
- Foreign cultures and languages
- Applied technology
- Government and civics, including state and federal constitutions

Common Core of Skills

- Problem solving
- Interpersonal communications
- Keyboarding and computer applications
- Critical thinking
- Creativity
- Life skills, including personal financial management skills

The Common Core of Knowledge and Common Core of Skills is implemented through content standards by grade level developed by the State Board of Education in consultation and coordination with local school districts. The content standards are in nine content areas: language arts, math, science, social studies, fine and performing arts, foreign language, health education, physical education, and career/vocation training.

Special Needs Students[1]

Wyoming law requires schools and districts to offer programs designed to address the special needs of identified student populations, including:

[1] W.S. 21-9-101

- Students with disabilities (special education programs);
- Economically disadvantaged students;
- Students with limited English proficiency; and
- Gifted and talented students.

Schools and districts must also meet federal requirements for these students.

All basket components are "implemented and enforced by rule and regulation of the State Board of Education, to be of sufficient quality to prepare students for future postsecondary education or employment opportunities and participation as citizens." Successful completion of content standards is measured through performance on state and district assessments and mandatory graduation requirements.[2] Further, the state accountability and accreditation systems hold schools and districts accountable for providing students equal access to a quality education (as defined by the basket of goods and services) no matter where they live.[3]

Cross-State Comparison

The educational program comparison included several components:

- An overview comparison of the content areas for which each state has standards.
- A deeper examination of the depth of standards in the subject areas of English language arts (ELA), math, and science for each state.
- A comparison of the requirements of the Hathaway Scholarship program against the graduation requirements of each state and the entrance requirements of its major universities.
- A comparison of the requirements in each state for special needs students, including special education students, ELLs, and gifted students.

Benchmark States

The comparison was done against two sets of benchmark states, regional and high performing. The regional states were: Colorado, Montana, Idaho, North Dakota, South Dakota, Nebraska, and Utah. High-performing states were selected based on a number of different data sources for overall K-12 performance and postsecondary and workforce readiness, including:

- K-12 student performance and rankings using:
  - 2015 National Assessment of Educational Progress (NAEP) results;
  - 2015 NAEP results adjusted for demographics;
  - Ed Week's K-12 Achievement Factor (C or better); and
  - Ed Next's ranking of state academic standards.
- Postsecondary and Workforce Readiness indicators using:
  - Perkins Career and Technical Education data;

[2] Legislative Services Office
[3] State Board of Education

Adjusted ACT Composite Score; and
- o Education Commission of the States College and Career Readiness scoring.

Based on performance across these measures, the following high-performing states were selected by the study team and approved by the select committee on August 28: Massachusetts, New Hampshire, New Jersey, Indiana, Vermont, and Virginia.

Overview of Required Content Standard Areas

The study team's first level of analysis focused on both the Common Core of Knowledge and Common Core of Skills because they are imbedded within Wyoming's nine content areas.

Compared against the 13 benchmark states, Wyoming had standards in similar content areas. While terminology differed, all states had content standards in: ELA, mathematics, science, social studies, fine and performing arts, foreign languages, and health education/physical education. Standards related to career technical education (CTE) varied and were most frequently specific to a given career course area. New Hampshire and New Jersey were most similar to Wyoming, in that they had related CTE standards that applied to all K-12 students. Ten of the states had separate technology and/or computer science content standards. Other content areas included by more than one state in their standards included: library (four states), financial literacy (three states), and driver's education (two states). The full comparison chart is included as Appendix A.

In-Depth Comparison of the Wyoming Educational Program in ELA, Math, and Science

RMC Research conducted an in-depth analysis of the standards in the areas of ELA, mathematics, and science because those are the content areas most frequently assessed. Full comparison charts are included in Appendices B–D. In each case, standards and programs for each grade level and content area (K-12) were compared to determine alignment, relative rigor, and relative specificity.

English Language Arts Content Standards

Regional States:

Identical to Wyoming	Similar to Wyoming	Different from Wyoming
South Dakota (K-12) and Utah (6-12)	Idaho, Montana, North Dakota, and Utah (K-5)	Colorado and Nebraska

Differences between Wyoming standards and states with similar standards were slight. For example, Idaho includes standards on handwriting, has some writing standards that are more detailed and specific than Wyoming, and also has one standard judged to be less rigorous than Wyoming. North Dakota has two additional standards that Wyoming did not include, but North Dakota did not have a standard similar to Wyoming's writing standard, W10: *Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences across grade levels*. North Dakota's standards also made no references to required length of writing or to keyboarding skills. A few standards included more detail and specifics or had a higher level of rigor compared to Wyoming. For example, North Dakota's L1 and L2 standards have been changed to reflect when skills should be introduced, practiced, and mastered.

Differences between Wyoming standards and those of Colorado and Nebraska were substantial. Colorado has more content standards than Wyoming and has also excluded a few that are contained in the Wyoming standards. Nebraska's standards are not based on the Common Core State Standards (CCSS) and vary greatly from Wyoming's standards, although they generally cover the same topic areas. Nebraska's standards varied in specificity, but in many cases were more detailed than those of Wyoming.

High-Performing States:

Identical to Wyoming	Similar to Wyoming	Different from Wyoming
New Hampshire and Vermont	Indiana and New Jersey	Massachusetts and Virginia

Differences between Wyoming standards and states with similar standards were slight. Some of New Jersey's standards are more expansive and have higher rigor than Wyoming. A few are less specific than those of Wyoming. Indiana's standards are based on CCSS, with some variations in rigor and specificity. Indiana also includes media literacy in its ELA standards.

Two states showed substantial differences from Wyoming in the ELA standards they adopted. Massachusetts standards are based on the CCSS, but vary in many ways, including the addition of Pre-K standards and other standards at earlier grade levels, the exclusion of a small number of standards, reorganized and expanded standards, and standards that vary in specificity and rigor. Massachusetts also explicitly links their ELA and mathematics standards at the K-5 level. Massachusetts also includes additional content area ELA standards, such as differentiated reading standards for history/social studies, science, and CTE. They also include speaking and listening standards for content areas. Virginia's standards vary greatly from those of Wyoming and are not directly comparable to the Common Core, likely because their standards were adopted in 2006. Some of the areas addressed in content standards that are not included in the Wyoming ELA standards include strategy usage, handwriting, research, and ethical and safe usage of the internet and technology.

Mathematics

Regional States

Identical to Wyoming	Similar to Wyoming	Different from Wyoming
Idaho and South Dakota	Colorado, Montana, North Dakota, Utah	Nebraska

States with standards similar to Wyoming vary in their differences. In Colorado, the main difference is the exclusion of several standards, such as 5.NF.4: *Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction*, all plus standard (e.g., N-CN.3: *Find the conjugate of a complex number, use conjugates to find moduli and quotients of complex* numbers), and the inclusion of standards targeting personal financial literacy. Montana's standards differed in the inclusion of content focused on Native Americans. North Dakota's standards generally mirror those of Wyoming with added standards, and some minor changes in specificity and rigor. Some of the standards that Utah included expanded on those of Wyoming, such as, N-CN.10: *Multiply complex numbers in polar form and use DeMoivre's Theorem to find roots of complex numbers*. Language specifying strategy usage was added to some standards.

Nebraska's mathematics standards do not align to the CCSS and are less comprehensive.

<u>High Performing States</u>

Identical to Wyoming	Similar to Wyoming	Different from Wyoming
Vermont and New Hampshire	Massachusetts and New Jersey	Indiana and Virginia

Massachusetts has a small number of additional standards, such as *Identify the values of all U.S. coins and know their comparative values (e.g., a dime is of greater value than a nickel). Find equivalent values (e.g., a nickel is equivalent to 5 pennies). Use appropriate notation (e.g., 69¢). Use the values of coins in the solutions of problems.* Massachusetts also expands several standards and includes pre-K standards. New Jersey standards only include a few wording changes from the CCSS.

Indiana's standards are substantially different from those of Wyoming. There are different sets of standards, and many standards are either more condensed or more expansive than those of Wyoming. Some standards have higher rigor. Virginia's standards are fewer in number and generally less comprehensive than those of Wyoming.

Science

<u>Regional States</u>

Identical to Wyoming	Similar to Wyoming	Different from Wyoming
None	Colorado, Idaho, Montana, Nebraska, and South Dakota	Utah

Both Colorado and Idaho have standards similar to those of Wyoming with some additions and deletions, some differences in grade levels, and an increase in specificity across standards. Montana has an increased emphasis on critical thinking, includes additional standards and information relevant to Native Americans, and does not include the K-5 Engineering Technology and Application to Science (ETS) standards. Nebraska has a few additional standards and fewer ETS standards. South Dakota has fewer standards, no ETS, two additional standards at the high school level, and an increase in rigor for a few of the standards. Utah's standards cover the same areas (earth and space science, life science, and physical science), but the standards are less rigorous in some areas. In addition, Utah's standards are structured differently with fewer objectives and are located at different grade levels. Utah also includes some standards specific to the state.

High Performing States

Identical to Wyoming	Similar to Wyoming	Different from Wyoming
New Hampshire (K-5), New Jersey (K-5), and Vermont	Indiana (K-5), New Hampshire (6-12), New Jersey (6-12), Massachusetts, and Vermont (6-12)	Indiana (6-12), Virginia

New Jersey, New Hampshire, and Vermont all have adopted the Next Generation Science Standards (NGSS). Wyoming's standards are NGSS with a few key differences at the 6-12 level, including additional ETS standards, the removal of one standard, and a few minor changes in specificity. Indiana's K-5 standards are similar to those of Wyoming, focusing on the same key areas. Key differences include the addition of some standards at earlier grade levels to scaffold into later grade levels, differences in location between grade levels, and the exclusion of some standards. Massachusetts' standards are similar to those of Wyoming with a few key differences, including the addition, deletion, and movement of standards.

Indiana's high school science standards are organized by course and go into much greater depth than those in Wyoming. Additional standards were also added at the middle school level, which is organized into discrete grade levels. Virginia's Science Standards of Learning were adopted in 2010, prior to the release of the National Research Council's (NRC) 2011 framework and the NGSS. Wyoming's standards are more focused on precursors for the scientific method and show greater alignment to NGSS and NRC than Virginia. Overall, Wyoming's standards are more rigorous and more specific than Virginia, and involve more investigation and problem solving.

Comparison of the Requirements of the Hathaway Scholarship Program

The Hathaway Scholarship Program curriculum requirements were first compared against minimum high school graduation requirements for Wyoming. In addition, they were compared against the benchmark states identified previously to determine if the scholarship requirements are more rigorous than the high school graduation requirements in the regional or high-performing states.

The Hathaway Scholarship program levels are:

Provisional Opportunity

- Course requirements: Meeting current graduation requirements in language arts, math, science, and social studies, and two years of either fine arts, CTE, or two years of foreign language
- Achievement benchmarks: 2.5 GPA and 17 on ACT

Opportunity

- Course requirements: Four years of language arts, math, and science, three years of social studies, and two years of either fine arts, CTE, or additional foreign language
- Achievement benchmarks: 2.5 GPA and 19 on ACT

Performance

- Course requirements: same requirements as Opportunity, plus two years of foreign language
- Achievement benchmarks: 3.0 GPA and 21 on ACT

Honors

- Course requirements: same requirements as Performance
- Achievement benchmarks: 3.5 GPA and 25 on ACT

The requirements for the Provisional Opportunity level of the Hathaway Scholarship are most closely aligned to the state's minimum graduation requirements, which include four years of ELS, three years of mathematics, three years of science, and three years of social studies. However, the Provisional Opportunity Hathaway Scholarship also requires additional coursework in CTE, fine arts, and foreign languages (two years total). The other three scholarship levels are more rigorous, requiring an additional year of math, while the Performance and Honors levels also require two years of foreign language.

It can be difficult to compare Wyoming's minimum high school graduation requirements and the higher Hathaway Scholarship requirements to those in other states because of the way courses/credits are accumulated. Colorado and Massachusetts focus on competency-based outcomes at the state level instead of course requirements. All states that identified course requirements require ELA and mathematics, with states generally requiring four years of ELA and three years of mathematics. States with a tiered diploma system, such as Virginia or Indiana, require a fourth year of mathematics for the advanced academic degree option.

On average, these states include three years of social studies and three years of science. Foreign language requirements varied, tending to be either included in a broad category where students could elect to take the courses (such as world language, arts, or CTE) or not required. New Jersey requires a year for all students, while Virginia and Indiana require three years for the advanced diploma, similar to how Hathaway requires foreign language for the two highest scholarship tiers. CTE requirements were another interesting area of variation, with about half including CTE in some capacity. Of those states, most include it within a category of options, while New Jersey and Montana require a year for all students and Indiana encourages elective choices to be college and career course options. Virginia includes completion of a pathway program as part of its Standard Diploma, while in Indiana CTE coursework is a requirement for a diploma with technical honors. Other requirements can include fine arts, humanities, physical education, health, and personal finance and economics.

Hathaway requirements were compared to Wyoming's college eligibility requirements and were found to be generally aligned to the University of Wyoming admission requirements at the Honors and Performance level. Comparable universities in the benchmark states had similar coursework requirements, though the number of years required for math and foreign language varied. A fourth year of math was often required if the student was applying for a related field, such as business, science, or health. GPA and ACT/SAT score minimums or the range for the middle 50 percent of entering students were comparable to the requirements of the Performance or Honors levels depending on the university.

A comparison of Hathaway to other statewide scholarship programs was also conducted. Two states (South Dakota and Utah) have scholarship programs that are merit-based, with eligibility requirements that are somewhat similar to those of the Hathaway Scholarship.

The full graduation and Hathaway Scholarship requirements comparison is included in Appendix E.

Comparison of Programs for Special Needs Students

Special Education

According to the Individuals with Disabilities Education Act (IDEA), all states are required to provide a free appropriate public education to all students with disabilities through age 21, who are found to be in need of special education services. Further, students need to receive their education in the least restrictive environment possible. Students are eligible for special education services if they have one of 13 different disability types that adversely affects their educational performance. Generally, there is minimal variation from state to state in their requirements for special education students. RMC explored state requirements in a number of areas where variation could exist, including optional alternate achievement standards, age ranges for eligibility for services, and age ranges for transition services from school to college or the workplace.

Similar to Wyoming, all regional and selected states have alternate achievement standards in ELA, mathematics, and science (several states are updating or developing science standards). Colorado, Indiana, Massachusetts, and Virginia have alternate standards in social studies and/or history, although students may not be tested in these areas. Massachusetts includes technology/engineering with science. Vermont will be developing alternate standards in physical education. Except for two states (Nebraska, which starts at birth, and Virginia, which starts at age two), all states have an age range for eligibility for services similar to that of Wyoming (ages 3 to 21). In most cases, the age range for delivery of transition services is like that of Wyoming (ages 16 to 21). Colorado mandates transitions services begin at age 15. Indiana and Massachusetts begin transition services at age 14.

The full special education requirements comparison is in Appendix F.

English Language Learner (ELL) students

Most comparison states identify ELL students through performance on the ACCESS for ELLs assessment. Further, many define ELL students as students whose lack of English language skills is inhibiting their ability succeed in the classroom, or to meet state content standards and proficiency expectations. Wyoming and all but one state (Nebraska) use the WIDA English Development Standards for their ELL students. All states follow the federal requirement that any program of service or curriculum provided to ELLs must be research or evidence based (no states have set program models for serving ELL students). The types of programs that meet this requirement in Wyoming and the comparison states include: two-way immersion/dual language, transitional bilingual education, English as a second language (ESL) pullout, content-based ESL, sheltered English instruction, structured English immersion, heritage language, specially designed academic instruction in English, and native language literacy programs.

The full ELL requirements comparison is in Appendix G.

Gifted and Talented

How gifted and talented students are defined varies from state to state. Most define gifted and talented as high-performing or high-ability students that need additional supports and services to reach their potential. This can be either academically defined, or based on a broader definition that includes high-performance capability in intellectual, creative, or artistic areas, possession of an unusual capacity for leadership, or excellence in specific academic fields (Idaho, Nebraska, and Vermont). While Wyoming requires programs to be provided for gifted students as part of the basket of goods and services, it does not specifically mandate the services or supports that need to be provided. Less than half of states have state mandates about how to serve gifted and talented students. If mandated, differentiated instruction is most frequently noted.

The full gifted and talented requirements comparison is in Appendix H.

III. Review of Wyoming's Current Funding Model

This report provides a review of Wyoming's current Legislative funding model used to generate state and local funding amounts for the state's school districts. The report is divided into four sections. The first section provides a description of the current evidence-based funding model that has been in use since 2006. The second section summarizes the four *Campbell* state Supreme Court cases and how they have influenced the various elements of the funding model. The third section compares key elements of the current Legislative model to the recommendations of 37 school finance adequacy studies conducted in 24 states between 2003 and 2014 to assess how Wyoming's model compares to multiple adequacy recommendations. The fourth and final section examines how Wyoming and other states adjust their funding of districts to compensate for uncontrollable costs, such as small districts and schools, isolated schools, inflation, and transportation or maintenance for isolated students. This section includes a summary of policies for small districts or schools and isolated school adjustments across the 50 states.

Overview of the Funding Model

Wyoming is one of a few states whose financing of public school districts must be cost based, meaning that its funding must reasonably cover the actual costs of local school districts. This practice, along with other finance system elements impacting how the state funds school districts, the equity of the system and how facilities construction and maintenance are funded have been shaped in important ways by a series of state Supreme Court decisions dating back to the 1980s.

The current funding model used to allocate funding to Wyoming's school districts has been in effect in its current form since the 2006-07 school year. This funding model is based on the evidence-based adequacy model developed by Picus and Odden (Odden & Picus, 2014). Using the costs of educational strategies supported by research, the funding model allocates district funding according to the resource needs of each school along with the district services needed to support schools and students. The model is divided into school resources and district resources.

School Resources

The school resources section of the model further delineates resources according to the following components:

- **Personnel**: core classroom teachers, elective/specialist teachers, CTE teachers, instructional facilitators or coaches, tutors, certified student support staff, librarians, school administrators, and classified staff.
- **Supplies and materials, and other items:** funded on a per-pupil basis, including gifted and talented programming, professional development, assessments, technology, CTE equipment, extra duty funds, and student activities.
- **At-risk resources:** for students requiring additional help to meet standards, including additional tutors and student support staff, programs for ELL, summer school and extended day programs, and alternative schools.

School resources are determined for each district using a set of prototypical schools for elementary, middle, and high schools. Counts of students using average daily membership (ADM) at the grade range for each school are used to estimate the resources generated for each prototypical school. Special prototypes are used to estimate resources for very small schools with fewer than 49 ADM, alternative schools, and schools located in small districts with fewer than 243 ADM.

District Resources

The district resources section of the model further delineates resources according to the following components:

- **Central office staff**: the superintendent, other administrative professional, and classified staff.
- **Supplies, equipment and technology**.
- **Maintenance and operations**: personnel, such as custodians, maintenance workers, and groundskeepers; and non-personnel items, such as supplies, materials, and utilities.

Personnel resources are generated on the basis of a 3,500 ADM school district. Minimum staffing FTEs are also set for districts with 1,000 ADM and with 500 and fewer ADM. Staffing FTEs are prorated up or down for districts with ADM counts falling between these benchmark sizes.

Reimbursements

This component consists of actual costs for which districts are reimbursed, including:

- special education;
- transportation;
- isolation and maintenance;
- special tuition; and
- teachers' extra pay.

Finally, the model incorporates certain adjustments used for calculating the Wyoming School Foundation "guarantee" for each district, including the regional cost adjustment to account for cost of living differences across districts, an external cost adjustment to account for inflation, and a hold harmless provision that prevents districts' foundation funding guarantee from falling below 2005-06 amounts.

The funding for districts is determined by applying the statewide average salary and appropriate benefit amounts for each position to the number of total FTEs calculated for the district. The amount for per-pupil funded items is calculated by multiplying the number of student ADMs by the per-pupil amount designated for each item.

Each of these funding model components are described in more detail in Table 3.1 below.

Table 3.1

Summary of the 2017-18 Legislative Model Elements

Model Element	Legislative Model (Current Law)
Base School Resources	
Elementary Core Teachers/Class Size	Grades K-5/6: 16. Average class size of 16 (K-5/6)
Secondary Core Teachers/Class Size	Grades 6-12: 21
Elective/Specialist Teachers	- Elementary schools 20% of core teachers - Middle schools and high schools 33% of core teachers
Additional CTE Teachers	- Applies additional weighting factor of 29% to CTE student FTEs - Based on weighted student count, provides an additional teacher for every 21 students
Minimum Teachers and Staff Resources	*Minimum Teachers* **Elementary Schools**: minimum of 6.0 teachers provided for elementary school grade bands with ADM greater than 49 **Middle Schools**: minimum of 8.0 teachers provided for middle school grade bands with ADM greater than 49 **High Schools**: minimum of 10.0 teachers provided for high school grade bands with ADM greater than 49 For school grade bands of 49 and below, minimum teacher resources are provided on a prorated basis at 1.0 teacher for every seven students with a minimum of 1.0 teacher. Additionally, there is a "small district adjustment," which provides districts with 243 or fewer ADM and a minimum of one teacher at each school for every grade level ADM.
Instructional Facilitators/Coaches	For 2017-2018, the model provides 0.81 FTE teacher position for each prototypical elementary school (288 ADM) and 0.81 FTE teacher position for each prototypical middle or high school (315 ADM). Resourced at the highest-grade prototype using total school ADM
Core Tutors/Tier 2 Intervention	Provides a minimum of 1.0 tutor position for each prototypical school, resourced at the highest-grade band level, ***less*** tutor positions provided on basis of at-risk student count (1.0 tutor position for every 100 at-risk students)
Substitute Teachers	- Provides for 5% (8.75 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches, and teacher positions for summer school and extended day - Resourced at a daily salary equal to $100.70 plus 7.65% for social security and Medicare benefits ($108.40) - Substitute resources provided for small schools
Core Pupil Support Staff, Core Guidance Counselors, and Nurses	***Core Pupil Support Staff:*** A minimum of 1.0 pupil support staff position is provided for each prototypical school, resourced at the highest-grade band level, ***less*** pupil support staff positions provided on basis of at-risk student count (1.0 pupil support staff position for every 100 at-risk students).
	Core Guidance Counselors: Provides 1.0 guidance counselor position for every 250 middle and high school students

Model Element	Legislative Model (Current Law)
	Nurses: No nurses resourced directly, but can utilize minimum pupil support resources as nurse positions
Supervisory and Instructional Aides	- Provides funding at an amount equal to 2.0 supervisory aide positions for each prototypical elementary school (288 ADM) - 2.0 supervisory aide positions for each prototypical middle school (315 ADM). - 5.0 supervisory aide positions each prototypical high school (630 ADM) - Resourced at the highest-grade prototype using total school ADM
Librarians and Librarian Media Technicians	***Librarian Positions:*** - Provides 1.0 librarian position for prototypical elementary schools (288 ADM) prorate up and down, below and above 288 ADM - For middle or high schools with ADM between 105 and 630 ADM, 1.0 librarian position - Below 105, ADM prorated down, and above 630, ADM prorated up ***Library Media/Computer Technician Position:*** - Provides 1.0 library media/computer technician position for every 315 middle and high school ADM, prorated up and down
Principals and Assistant Principals	- Provides 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, prorated by ADM below 105 ADM down to 49 ADM - Provides 1.0 assistant principal position for every 288 elementary ADM beginning at 289 ADM; 1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM - Resourced at the highest-grade band level
School-Site Secretarial and Clerical Staff	***Secretarial Staff:*** - Provides 1.0 secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels - Provides an additional 1.0 secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle school ADM starting at 315 ADM - Provides an additional 1.0 secretary position for every 630 high school ADM, starting at 630 ADM ***Clerical Staff:*** - Provides 1.0 clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM - Provides 4.0 clerical positions for every 630 high school ADM, prorated above and below 630 ADM - All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM
Supports for Special Needs Students	
At-Risk Tutors	- Provides 1.0 tutor position for every 100 at-risk students - Not provided for small or alternative schools
At-Risk Pupil Support Staff	- Provides 1.0 at-risk pupil support position for every 100 at-risk students - Not provided for small or alternative schools

Model Element	Legislative Model (Current Law)
Extended Day and Summer School Program Funding	- For both extended-day and summer school programs, funding is provided outside of block grant and as a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students - Not provided for small or alternative schools - A minimum 0.50 FTE is provided for school districts that do not generate that amount based on the district's at-risk count
English Language Learner (ELLs) Students	- Provides 1.0 ELL teacher position for every 100 ELL students - Not provided for small or alternative schools
Alternative Schools	- Provides funding for all staff at a ratio of 1.0 assistant principal and 1.0 teacher position for every 7 ADM
Dollars per Pupil Resources	
Gifted and Talented Students	- Provides an amount equal to $40.29 per ADM
Professional Development	- Provides 10 days of student-free time for training in salary levels; $125.90 per ADM for trainers
Instructional Materials	- Provides $191.37 per ADM for elementary, middle, and high schools
Formative Assessments	- Provides $25.00 per ADM and not subject to an ECA
Technology and Equipment	- Provides an amount equal to $250.00 per ADM
CTE Equipment/ Materials	- Provides an amount equal to $9,428.77 per vocational education teacher FTE
Extra Duty Funds/Student Activities	- For elementary grades, provides an amount equal to $23.79 per student - For middle and high schools, use inverse sliding scales based on ADM. Middle school funding levels range from $782.54 for 1 ADM and $202.18 per ADM for a school of 1,260 ADM. High school funding levels range from $2,017.22 for 1 ADM and $594.63 per ADM for a school of 1,260 ADM - Alternative schools are funded as any other school - Sixth grade elementary students funded using the elementary per-ADM amount and ninth grade students included in the high school ADM for the schools they would attend
Central Office Resources	
Central Office Staff Resources	- 500 or fewer ADM: 3.0 administrative and 3.0 classified p ositions - 1,000 ADM: 4.0 administrative and 4.0 classified positions Position counts prorated down linearly between 1,000 to 501 ADM - 3,500 ADM: 8.0 administrative and 10.0 classified positions Position counts prorated down linearly between 3,500 to 1,000 ADM - Position counts prorated up linearly above 3,500 ADM
Central Office Supplies	Provides an amount equal to $365.86 per ADM for non- personnel resources
Maintenance and Operations	

Model Element	Legislative Model (Current Law)
Maintenance and Operations Staff	***Custodian Positions:*** Calculated on the basis of four factors: 1) number of model- generated teachers; 2) school ADM; 3) number of classrooms, as reported by the School Facilities Department (SFD); and 4) the lesser of actual educational gross square footage (GSF) or SFD allowable educational GSF, adjusted up by 115%. These four factors are added together and divided by four to arrive at the preliminary FTE. The factor for each of these components is derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich (13 teachers standard; 325 ADM standard; 13 classrooms standard; 18,000 GSF standard). This base FTE is further adjusted by an additional 0.5 FTE for secondary schools. Small schools do not generate custodial FTE positions. Custodian FTEs for non-educational buildings are based solely on the GSF factor, which is limited to 10% of a district's total allowable educational GSF divided by the Zureich factor (18,000 GSF).
Maintenance and Operations Staff	***Maintenance Worker Positions:*** Calculated on the basis of four factors: 1) building; 2) the lesser of actual educational GSF or SFD allowable educational GSF, adjusted up by 115%; 3) school ADM; and 4) FY 2006 GF operating expenditures. These four FTE factors are added together and divided by four to arrive at a base FTE. The factor for each of these components is derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich: 1.10 building factor; 60,000 GSF standard and a 1.20 factor; 1,000 ADM standard and 1.30 factor; $5 million standard and 1.20 factor). The base number is further adjusted for: 1) school level (base FTE is multiplied by 0.80 for elementary schools, 1.0 for middle schools, and 2.0 for high schools); 2) building age where schools under 10 years old are multiplied by a factor of 0.95 and over 30 years old by a factor of 1.10; and 3) small district size where FTE are multiplied by a factor of 1.10 for under 1,000 ADM. It is assumed that the maintenance worker FTEs determined on the basis of a district's total allowable educational GSF for schools are sufficient to service all buildings in a district, both educational and non-educational.
	Groundskeeper Positions: Determined at the site rather than building/program level. The number of FTEs for all sites, both educational and non-educational, is based on the number of acres of the site and the standard for the number of annual work hours per acre (93 hours). The FTE calculation assumes a 2,008 hour work year for groundskeepers. The initial FTE is adjusted for the primary school level or use of the site, with non-educational and elementary school sites receiving no additional adjustment, middle school sites receiving an adjustment factor of 1.5, and high school sites an adjustment factor of 2.5. Groundskeeper FTE calculations for acreage acquired by a district after July 1, 1997, are based on the lesser of the actual site acreage on which the facility is situated or the SFD/SFC guidelines: elementary schools (four acres plus one acre for every 100 ADM); middle schools (10 acres plus one acre for every 100 ADM; high schools (20 acres plus one acre for every 100 ADM). In instances where districts acquired acreage after July 1, 1997 through an exchange of land with another government entity, and the acreages involved in the exchange were originally acquired by the district and the government entity on or before July 1, 1997, the acreage is not subject to the SFC guidelines. The entire acreage will be used in the calculation of groundskeeper FTEs. If a district has acquired a site after July 1, 1997, and the site is without a facility situated on it or has a facility under construction, groundskeeper FTEs will not be generated for the acreage.

Model Element	Legislative Model (Current Law)
Maintenance and Operations Supplies and Materials	Funding for O&M supplies is calculated at a rate of $0.67 per GSF for both educational and non-educational space. For educational space, GSF is equal to the lesser of actual educational GSF or allowable educational GSF adjusted up by 115%. Funding for non-educational space is equal to 10% of a district's total allowable educational GSF.
Utilities	Funding for utilities is based on actual FY 2009-10 district expenditures, as reported by the WDE (expenditure functions 3410-3450 & 3490 Only; Objects 451-459 plus communications - object 340, excluding special education functions 1210 & 2230 and student transportation functions 3510 & 3520), as adjusted by the ECA enacted by the Legislature for FY 2012 through FY 2016 and FY 2018. For additional school buildings added (not replacement schools) to a school district's building inventory after school year 2009-10, multiply the average GSF cost as adjusted by the ECA by the total GSF (lesser of actual or SFD allowable) for the new buildings to provide additional utility resources for the new GSF.
Reimbursements	
Special Education	100% reimbursement of approved expenditures
Transportation	For 2017-2018, reimburse 100% of the allowable expenditures from school year 2016-2017. For 2018-2019 and each school year thereafter, provide an amount for operations funding equal to the average of the amounts reimbursed for school years 2014-2015, 2015-2016, and 2016-2017. Capital outlay can only be purchased on an emergency basis, as approved by the Department of Education. Capital outlay purchased prior to or after March 15, 2017, will be reimbursed under current law.
Isolation and Maintenance Payments	Provides 100% reimbursement for any isolation and maintenance payments, as provided under Wyoming Statute 21-4-401
Special Tuition Payments	Provides 100% reimbursement for any special tuition payments, as provided under Wyoming Statutes 21-4-501(d) and 21-4-505(a)
Teacher Extra Salaries	Provides 100% reimbursement for any extra salaries payments, as provided under Wyoming Statute 21-13-324
Other Adjustments	
Regional Cost Adjustment	Provides the greater of the 2005 Hedonic Wage Index (HWI) or the average of the last six Wyoming Cost of Living Indices (WCLI), with a minimum of 1.0 (statewide average)
External Cost Adjustment	Monitoring process established by W.S. 21-13-309(u). Recommended cost indices include: • Professional staff – use a Wyoming specific Comparable Wage Index; • Non-professional staff – use a Wyoming specific High School Comparable Wage Index; • Supplies and Materials – use the Producer Price Index for Office Supplies and Accessories; and • Energy – use the Producer Price Index (PPI) for Commercial Electric Power (weighted at 29.10%) the PPI for Commercial Natural Gas (weighted at 58.54%) and the PPI for Gasoline (weighted at 12.36%).

Model Element	Legislative Model (Current Law)
Hold Harmless	The hold harmless adjustment is provided to ensure that a district's (model generated resources, less reimbursable amounts, is not less than 100 percent of a district's school foundation program amount in school year 2005-06 (the year the new funding model was adopted). A school district does not receive a hold harmless adjustment if the decrease in funding is due to decreasing ADM.

The Impact of Education Finance Court Cases

The four *Campbell* cases decided by the Wyoming Supreme Court between 1995 and 2008[4] have played a significant role in shaping Wyoming's current model for funding its K-12 school districts (the legislative model).

In 1995, ***Campbell I*** found Wyoming's school finance system to be unconstitutional on both equity and adequacy grounds. As part of the remedy, the Court directed the Legislature to conduct a cost of education study and use the results to develop a new finance system that is cost-based and otherwise meets the requirements of the Constitution. The Court also found that the quality of school facilities constitutes a part of equal educational opportunity and that a finance system allowing for "deficient" facilities violates the Constitution. In summary, the Court concluded that:

> … the legislature must first design the best educational system by identifying the "proper" educational package (e.g. the basket of educational goods and services) each Wyoming student is entitled to have whether she lives in Laramie or in Sundance. The cost of that educational package must then be determined and the legislature must then take the necessary action to fund that package. Because education is one of the state's most important functions, lack of financial resources will not be an acceptable reason for failure to provide the best educational system. All other financial considerations must yield until education is funded.
>
> The state financed basket of quality educational goods and services available to all school-age youth must be nearly identical from district to district. If a local district then wants to enhance the content of that basket, the legislature can provide a mechanism by which it can be done. But first, before all else, the constitutional basket must be filled (Campbell, 1995).

Based on testimony from the lower court trial, the Court provided a list of some of the components indicative of a quality education (Campbell, 1995):

- small schools;
- small class size and low student-teacher ratios;
- textbooks;
- low student-computer ratios;
- integrated, substantially uniform, substantive curriculum;
- ample and appropriate provision for at-risk students, special problem students, and gifted and talented students;

[4] *Campbell County School District v. State,* 907 P.2d 1238 (Wyo. 1995), also known as *Campbell I*; *State v. Campbell County School District*, 19 P.3d 518 (Wyo. 2001), also known as *Campbell II*; *State v. Campbell County School District*, 32 P.3d 325 (Wyo. 2001) *Campbell County School District*; and *Campbell County School District v. State,* 181 P.3d 43 (Wyo. 2008), also known as *Campbell IV*.

- meaningful standards for course content and knowledge attainment intended to achieve the legislative goal of equipping all students for entry to the University of Wyoming, Wyoming Community Colleges, or achievement of other purposes of education; and
- timely and meaningful assessment of all students' progress in core curriculum and core skills regardless of whether those students intend to pursue college or vocational training.

In ***Campbell II*** (2001), the Court reviewed the following components of the funding model resulting from *Campbell I*: salaries, benefits, class sizes, maintenance and operations, transportation, special education, at-risk students, gifted and talented education, an external cost adjustment, a small school adjustment, a small school district adjustment, and a regional cost adjustment (Hewitt, 2017). It also found the financing system for facilities, which was primarily locally financed, once again unconstitutional.

Specifically, the Court ruled on each component as follows:

- **Salaries and benefits**: The Court noted that a finance system could not be considered adequate if it did not reflect the actual cost of teachers necessary to “deliver the basket.” It supported the adjustment of teachers’ salaries for educational attainment and experience, but found salaries for administrators and classified employees, which were not adjusted, unconstitutional because they were not cost based.
- **Class size**: The Court did not recommend specific class sizes, but noted that they are among the most important elements of a quality education. It also noted the body of research supporting small elementary school class sizes.
- **Maintenance and operations**: The Court found that using historical spending averages was not constitutional because more accurate cost measures were available.
- **Transportation and special education**: The Court upheld the model’s reimbursement of 100 percent of the previous year’s costs. Spending increases above the prior year’s levels were not reimbursed until justified as necessary, in which case they would be reimbursed the following year.
- **Educating special needs students**:
    - *Economically disadvantaged*: The funding model at the time provided $500 per student eligible for the federal free and reduced-price lunch program. The Court found this unconstitutional for multiple reasons, including: 1) the amount had no relation to the actual costs of serving these students, 2) the model did not fund eligible students in schools with concentrations below the state average, and 3) free and reduced-price lunch counts were not representative of all economically disadvantaged students.
    - *English language learners (ELLs)*: The funding model provided $900 per ELL pupil once an ELL student concentration threshold was reached. The Court found this approach unconstitutional because the $900 was not cost based. It suggested that reimbursement of actual, approved expenditures would be preferable.

    - *Gifted and Talented*: The model at the time provided $9 per ADM. The Court accepted this because it found adequate evidence was not available to demonstrate that this amount did not meet constitutional requirements.
- **Career and Technical Education (CTE)**: The funding model did not provide any additional funding for CTE programs. The Court ruled that it needed to be funded on a cost basis.
- **External Cost Adjustment**: The Court ruled that for the model to remain constitutionally cost based it must be adjusted for inflation at least every two years. It approved of the use of the WCLI since it was generally accepted by the education community, but other adjustments could be used as long as they ensured that funding under the model remained adequate.
- **Small School Adjustment**: The court found that small school size thresholds must be cost based and could not be set arbitrarily. Similarly, the expenditure areas subject to an adjustment must also be justifiable and cost based.
- **Small School District Adjustment**: The court found no evidence to support the inclusion of a small district adjustment and found the adjustment in place in the funding model unconstitutional.
- **Regional Cost Adjustment**: The Court found that the regional cost adjustment used (in this case the WCLI) should be applied to several components that were not being adjusted, including: 1) medical costs and 2) housing costs (specifically rental costs). Again, the adjustment must be applied in a way that ensures the model is cost based.

The 2001 ***Campbell III*** decision dealt with the ongoing issue of capital facilities funding. In both *Campbell I* and *Campbell II* the Court found the system reliant largely on local bonding was unconstitutional because it did not ensure equal educational opportunity for all students across the state. The Court upheld the use of a facilities condition scoring system developed by MGT Consulting to determine eligibility for state funding assistance, but ruled that the standard for assistance, "inadequate" and "in need of immediate capital construction," was unconstitutional. The Court stated that the standard for state capital construction funding should be whether or not a facility is "in a condition where only routine maintenance is required." The Court also said a new scoring system could be developed for future facilities ratings. Further, the Court stated that districts were no longer required to reach a 90 percent level of bonded indebtedness to qualify for state funding. Finally, the Court sought to clarify the state's obligation for supporting school facilities by stating that it was only required to provide funding needed for facilities capable of providing the "educational services determined appropriate by the State of Wyoming." Districts that wanted facilities exceeding this standard would need to look for other sources of funding.

In *Campbell IV* (2008) the Court once again reviewed various components of the funding model, which had been recalibrated following the *Campbell II* decision. The model components reviewed included: salaries and benefits, class size, maintenance and utilities, at-risk students, career and technical education, small school adjustment, small district adjustment, regional cost adjustment, external cost adjustment, and preschool funding.

The Court ruled on each component as follows:

- **Salaries and benefits**: In this decision, the Court found that model salaries, even though they were consistently below actual salaries paid, were adequate because they were sufficient to attract and retain teachers, and had been increased significantly over time. The Court stated that the model did not need to match real-time costs and that differences between model funding levels and actual costs will differ to some extent.
- **Class sizes**: Even though class sizes were not challenged in *Campbell IV*, the Court noted that those established in the original funding model (16 to one in K through fifth grades and 21 to one in sixth through twelfth grades) seemed appropriate, but were smaller than in most other states, and no evidence was available supporting adopting smaller class sizes.
- **Maintenance and utilities**: Maintenance funding at this point in time was based on the recommended square footage amounts developed by the School Facilities Commission. In an effort to encourage districts to eliminate excess space, this recommended amount, regardless of the actual size of a facility, was phased down to 115 percent of the applicable allowable square footage. Utilities were funded based on average actual costs and adjusted via the recalibration process. The Court upheld these funding measures although it expressed some concerns about inequities caused by funding maintenance based on permissible square footage and urged the state to assist districts in cases where excess capacity is not the fault of the district.
- **At-Risk Students**: The Court upheld a new at-risk counting mechanism consisting of mobility, eligibility for free and reduced-lunch, and ELL counts. It also upheld a funding formula that increased funding to districts with higher concentrations and reduced it for those with lower concentrations. The court noted that it is difficult to determine the exact cost of serving at-risk students because the approaches are so varied across districts.
- **Career and Technical Education**: The Court upheld a new funding approach based on an extensive study of the costs of delivering CTE, including smaller class sizes and additional funding for materials and equipment. Although the state still did not fully fund all requests for equipment funding, the Court upheld the practice because equipment constituted a relatively small percentage of CTE spending. The Court also noted that "no one has suggested that every school must have exactly the same vocational opportunities."
- **Small School Adjustment**: The Court upheld the current adjustment, which was based on a state-sponsored study, and was based on data and contained no arbitrary cutoffs.
- **Small District Adjustment**: The Court upheld this adjustment as well, noting that the state had studied the issue and developed a cost-based approach.
- **Regional Cost Adjustment (RCA)**: At the time of the decision, the WCLI used for the RCA included the medical and rental cost components that were excluded at the time of the *Campbell II* decision. However, the RCA-adjusted districts with lower than average costs by a factor of less than 1.0. The Court ruled that the floor for the adjustment must be the statewide average teacher salary.
- **External Cost Adjustment**: The Court upheld the state's inflation adjustment, stating that as long as the model is based on historic average costs it must be adjusted for inflation to maintain adequacy.
- **Cost Plus Funding**: Between *Campbell II* and *Campbell IV* the state often provided funding in excess of the amount generated by the funding model. Districts argued that this was evidence

that the model itself was inadequate, but the Court disagreed, stating that additional funding between recalibrations is the prerogative of the Legislature.

- **Pre-School Funding**: The plaintiffs in the case argued that the educational benefits of prekindergarten warranted state funding for voluntary preschool programs. The Court ruled that the constitution only mandated state-supported education for children between the ages of six and 21, therefore preschool funding is not required as part of the model.

Comparing Wyoming's Legislative Model to Recent Adequacy Study Recommendations

As part of its review of the current Legislative Funding Model, APA compared major provisions of the funding model to recommendations from 37 adequacy studies conducted between 2003 and 2014. Because Wyoming funds schools on a cost basis, a reasonable comparison could not be made to the systems used in other states because they are not cost based but instead, set funding amount according targets based on available revenues. Comparing Wyoming's funding model to the recommendations of recent adequacy studies provides better comparability since presumably adequacy recommendations are also cost based (i.e. they represent what resources are actually needed to enable districts, schools, and students to meet state performance expectations).

To make this comparison, APA used a summary of the recommendations of 37 adequacy studies conducted between 2003 and 2014. This original summary included two studies conducted for Wyoming's 2010 and 2015 recalibrations, which were excluded from this study because the Legislative Funding Model is significantly based on these EB studies.

Of the 37 studies included in the comparison, 22 studies employed the professional judgment (PJ) method as a primary approach to estimating adequacy, 13 studies used the evidence-based (EB) method, and two studies used the successful schools/districts (SSD) method. Twenty-two of the studies supplemented the primary method with one or more additional approaches for estimating adequacy. The studies were conducted in 24 different states, with multiple studies conducted in 10 of these states (four studies have been undertaken in Colorado since 2003). Six of the studies were conducted as a result of lawsuits or court rulings, while others were required by legislation or undertaken due to state agency initiatives, stakeholder interest, or periodic recalibrations.

Table 3.2 below lists the 37 studies, the year each was completed, and the method or methods used for estimating adequacy.

Table 3.2
Adequacy Studies and Methods Used, 2003-2014

State	Year	Primary Study Approach	Secondary Approach
Arizona	2004	EB	PJ

State	Year	Primary Study Approach	Secondary Approach
Arkansas	2003	EB	PJ
Arkansas	2006	EB	
California	2006	PJ	
California	2007	PJ (survey)	
Colorado	2003	PJ & SSD	
Colorado	2006	PJ & SSD	
Colorado	2011	PJ & SSD	
Colorado	2013	PJ & SSD	
Connecticut	2005	PJ & SSD	
D.C.	2013	PJ & SSD	
Illinois	2010	EB	
Kentucky	2003	EB	
Kentucky	2003	PJ	
Kentucky	2004	PJ	
Maine	2014	EB	PJ
Minnesota	2004	PJ	
Minnesota	2006	PJ & SSD	
Montana	2005	PJ (survey), EB & SSD	
Montana	2007	PJ & SSD	
Nevada	2006	PJ & SSD	
New Jersey	2006	PJ & SSD	
New Jersey	2007	EB	
New Mexico	2008	PJ	
New York	2004	PJ	
New York	2004	SSD	
North Dakota	2008	EB	PJ
North Dakota	2014	EB	PJ
Ohio	2009	EB	
Pennsylvania	2007	PJ & SSD	EB
Rhode Island	2007	PJ, EB & SSD	
South Dakota	2006	PJ & SSD	
Tennessee	2004	PJ & SSD	
Texas	2012	EB	
Washington	2006	SSD	
Washington	2006	EB	PJ
Wisconsin	2007	EB	PJ

Table 3.3 below provides a list of consultants carrying out each of the studies. The two groups with the most studies are Picus Odden and Associates with 14 of the studies and APA with 11.

Table 3.3
Adequacy Studies Conducted by Consulting Firm, 2003-2014

Firm Conducting Study	Number of Studies

Firm Conducting Study	Number of Studies
Picus Odden & Associates	14
Augenblick, Palaich & Associates	11
American Institutes for Research	2
R. Craig Wood and Associates	2
Multiple Firms	3
Public Policy Institute of California	1
National Louis University	1
Deborah Verstegen	1
Management Analysis and Planning	1
Standard and Poor's	1

Few of the studies included a recommendation for each element of Wyoming's funding model. For example, few specific recommendations on regional and inflation cost adjustments were included among these studies. No study made recommendations regarding student transportation. Further, no element included in this comparison was addressed by all 37 of the studies.

Table 3.4 shows the model elements for which comparisons are included in this report. In addition to these elements, APA also reviewed each report for any recommendations on salary levels, CTE, and specific strategies for serving students with disabilities. The studies did not generally address these model elements. One study noted using teacher salaries other than the current state average studies, the EB studies and two PJ studies recommended specific amounts for CTE materials and equipment but not for CTE teachers, and only the EB studies included recommendations for special education strategies.

Table 3.4
Model Components Compared Across Studies

Model Components	
Central office administration	Instructional coaches
Class size	Gifted and talented
Elective teachers	Professional development
At-risk staffing	Instructional materials
Pupil support staffing	Technology
ELL	Assessments
Special education	

Because these studies were carried out in different years and states, APA sought to improve comparability by making several adjustments. First, the costs of elements involving personnel costs were standardized by using state average salary amounts for teachers and aides collected in surveys administered by the National Education Association. The average teacher salaries were estimated salaries for 2017 from their *Rankings of the States 2016* report.[5] The average salary for aides is also an NEA estimate.[6] Because the estimate is for a national average salary, it was adjusted for regional cost of living differences using the state-by-state comparable wage index (CWI) from the National Center for Education Statistics.[7] The amount was also adjusted for inflation to 2017 levels using the CPI-U from the Bureau of Labor Statistics.[8] The comparison of costs for central office administration used average salaries collected by the Educational Research Service for their National Survey of Salaries and Wages in Public Schools.[9] The recommended amounts for non-personnel elements are presented without adjustments because these amounts tended not to vary consistently across states or over time. For example, recommendations for technology funding were consistently reported as $250 in studies carried out in twelve different states between 2003 and 2014. As a result, the study team determined that adjusting for either regional cost differences or inflation for non-personnel items would not improve the precision of the comparisons.

A table comparing recommendations is included for each of the model elements included in this comparison. The tables present the amount from Wyoming's 2017-18 Legislative Funding Model and study recommendations for several other states. In most cases, the states included represent nearby states, but in cases where studies from regional states included a recommendation, or where a different study provided a contrasting recommendation, recommendations from other states were included.

Class Size

These class sizes typically pertain to core classes, such as reading/English language arts, math, science, and social studies. In elementary schools, core teachers typically are responsible for a classroom throughout the day. In middle and high schools with departmentalized instruction, core teachers focus on math, language arts, science, social studies, and world languages. Thirty-two of the studies included a specific recommendation on core class sizes in elementary, middle, and high schools:

- Ten studies determined teacher FTE on a per-prototypical school basis.
- Thirteen EB studies recommended specific student-teacher ratios by grade band.
- Four non-EB studies also recommended specific student-teacher ratios by grade band.
- Five studies determined teacher FTE on a per 1,000 students basis.

[5] NEA Research. (2017). Rankings of the States 2016 and Estimates of School Statistics 2017. Washington, DC: Author.

[6] Getting Educated: Paraeducators.

[7] NCES State CWI 1997-2014, http://bush.tamu.edu/research/faculty/Taylor_CWI/

[8] Bureau of Labor Statistics, Consumer Price Index Databases, https://www.bls.gov/cpi/data.htm

[9] Educational Research Service, National Survey of Salaries and Wages in Public Schools, 2005-06.

Table 3.5
Comparison of Class Size Recommendations

Study	Elementary K-3	Elementary 4-5	Average Elementary K-5	Middle	High
Wyoming Legislative Model	16	16	16	21	21
North Dakota 2008 and 2014 EB	15	25	20	25	25
Colorado 2006 PJ[10]	16	16	16	22	18
Colorado 2013 PJ[10]	18	18	18	23	30
Montana 2007 PJ[10]	16	16	16	16	16
Nevada 2006 PJ[10]	17	17	17	25	26
South Dakota 2006 PJ[10]	18	18	18	23	24
Average of All Studies	16	21	18	23	23
Median of All Studies	16	19	17	24	25
Mode of All Studies	15	25	20	25	25

On average, class sizes were lowest in grades K-3, 18:1 on average in elementary grades and 23:1 in secondary grades which the median and mode varying slighting.

Elective Teachers

Typically, elective teachers at the elementary level teach art, music, and physical education classes to provide time for core classroom teachers to plan and collaborate. At the middle and high school levels, core teachers are used to offer non-core elective classes. Twenty-eight studies included a specific recommendation on the number of elective teachers required in elementary, middle, and high schools:

- Fifteen studies determined elective teacher FTE as a percentage of core teachers.
- Ten studies determined elective teacher FTE on a per-prototypical school basis.
- Three studies determined elective teacher FTEs on a per-1,000 students basis.
- In 13 EB studies, the number of elective teacher FTEs was determined on a percentage of core teachers basis:
    - Ten of the EB studies recommended 20 percent for elementary and middle school, and 33 percent for high school.
    - Three of the EB studies recommended 20 percent for all school levels.

[10] Note, in the initial presentation on findings to the Select Committee, electives teachers were counted in these figures. To make them more comparable, elective teachers were removed which resulted in large class sizes than originally shown.

Table 3.6
Comparison of Recommendations for Elective Teachers as Percentage of Core Teachers

Study	Elementary	Middle	High
Wyoming Legislative Model	20%	33%	33%
North Dakota 2008 and 2014 EB	20%	20%	33%
Colorado 2006 PJ	16%	44%	33%[11]
Montana 2007 PJ	41%	33%	33%[11]
Nevada 2006 PJ	14%	33%	33%[11]
South Dakota 2006 PJ	28%	33%	33%[11]
Average of All Studies	18%	21%	22%
Median of All Studies	20%	20%	30%
Mode of All Studies	20%	20%	33%

At-Risk Staff

At-risk staff includes teachers, support staff, and in some cases aides, for providing instruction and related services to at-risk students. Twenty-four studies included a specific recommendation on the number at-risk staff FTEs:

- Ten EB studies determined FTEs on a per number of low-income students basis (generating tutors, pupil support staff, extended day and summer school staff, similar to the Wyoming Legislative Model).
- Three other studies also generated FTEs on the basis of the number of low-income students in a school.
- Six studies determined FTEs on a per prototypical school basis.
- Five studies determined funding amount using at-risk weights.

Table 3.7
Comparison of Recommendations for At-Risk Staff Funding Per Pupil

Study	Weight	Elementary	Middle	High
Wyoming Legislative Model	0.23[12]	$1,760	$1,760	$1,760
Colorado 2006 PJ[13]	0.37	$4,718	$2,207	$2,207
Colorado 2013 PJ	0.31	$3,203	$3,416	$3,100
Montana 2007 PJ	0.50	$5,094	$5,840	$5,688
Nevada 2006 PJ	0.29	$3,274	$2,546	$2,077
South Dakota 2006 PJ	0.69	$6,285	$4,573	$4,391

[11] Note, in initial presentation on findings to the Select Committee, electives teachers were counted in core figures. They have been separated and are presented here as a percentage of core.
[12] Imputed weight based upon allocated resources.

Study	Weight	Elementary	Middle	High
Average of All Studies	0.35	$2,661	$2,348	$2,216
Median of All Studies	0.30	$1,896	$1,985	$1,928
Mode of All Studies	0.26	$4,718	$2,207	$2,207

Pupil Support Staff

Pupil support staff refers to professional staff, such as school counselors, psychologists, social workers, and nurses. In some studies, these staff are only allocated on the basis of the number of special needs students in a school. In others, they are part of schools' base staffing. In still other studies, they may be allocated on the basis of both. Thirty-one studies included a specific recommendation on the number of pupil support staff FTEs:

- Fourteen studies determined FTEs on a per prototypical school basis.
- Thirteen EB studies determined FTEs on the basis of the number of low-income students: Ten studies recommended 1.0 FTE per 100 low-income students. Both North Dakota studies recommended 1.0 FTE per 125 low-income students. TX recommended 1.0 FTE counselor per prototypical school and 1.0 FTE nurse per 750 students.
- Three studies used different ratios of staff to low-income students (Minnesota 2004, 2006 and Montana 2007).
- One study determined FTE on a per 1,000 students basis (Connecticut: one per 1,000 students).

Table 3.8
Comparison of Recommendations for
Pupil Support Staff Funding Per Pupil

Study	Elementary	Middle	High
Wyoming Legislative Model	$238	$238	$238
North Dakota 2008 EB	$119	$206	$206
Colorado 2006 PJ	$616	$779	$682
Montana 2007 PJ	$522	$726	$562
Nevada 2006 PJ	$230	$260	$252
South Dakota 2006 PJ	$178	$276	$208
Average of All Studies	$452	$458	$419
Median of All Studies	$396	$438	$426
Mode of All Studies[14]	NA	NA	NA

English Language Learner (ELL) Students

ELL teachers typically serve students learning English through pull-out or push-in instructional models. A variety of staffing models were recommended in the studies reviewed for this summary. Wyoming's

[14] No recommended amount appeared more than twice.

current funding model provides 1.0 FTE ELL teacher per 100 ELL students. Because ELL students are also included in the at-risk count they generate at-risk resources, such as tutors, pupil support staff, and extended day and summer school programs. Where possible, recommendations, including Wyoming's funding model, were converted to a per-pupil weight to facilitate comparisons.

- Thirteen EB studies all included recommendations that were the same or similar to Wyoming's model, except in the Arizona and Arkansas studies the recommended FTEs were 0.4 FTE per 100 ELL students for ELL teachers.
- Fifteen studies using the PJ method and recommended ELL staffing rates that were converted to per-pupil weights or to dollar amounts per ELL student.
- Nine studies did not provide a recommendation for ELL support.
- Staffing recommendations varied by school size, ELL concentrations, and PJ panel recommendations. The recommendations varied from 0.1 FTE teacher in Tennessee to 3.8 to 7.8 FTEs in Nevada, depending on school level.

Table 3.9
Range of ELL Recommendations

Study	Elementary	Middle	High
District of Columbia 2013 PJ	2 teachers, 0.4 pupil support, 0.1 coordinator	2.8 teachers, 0.5 pupil support, 0.1 coordinator	4.7 teachers, 0.6 pupil support, 0.2 coordinator
Kentucky 2003 PJ	1 teacher/15 ELLs all levels		
Montana 2007 PJ	0.5 teachers, 2 aides	0.3 teachers, 1 aide	0.3 teachers, 1 aide
Nevada 2006 PJ	2 teachers, 1 aides, 0.3 IF, 0.5 parent liaison	2 teachers, 3 aides, 0.3 IF, 0.5 parent liaison	4 teachers, 3 aides, 0.3 IF, 0.5 parent liaison
Tennessee 2004 PJ	0.1 teacher/prototypical school all levels		

Table 3.10
Comparison of Recommendations for Revenues per ELL Student

Study	Weight	Elem	Middle	High
Wyoming Legislative Model	.30[15]	$2,053	$2,053	$2,053
Colorado 2003 and 2006 PJ	.51	$3,872	$3,469	$4,913
Colorado 2013 PJ	.47	$3,868	$3,868	$3,868
Connecticut 2005 PJ	.76	$8,824	$8,824	$8,824
Montana 2007 PJ	.71	$9,874	$8,342	$4,634
North Dakota 2014 EB	.27	$2,608	$2,608	$2,608

[15] Imputed weight including ELL teacher staffing, for a 0.07 weight, and at-risk funding, which generates a 0.23 weight for a 0.30 total.

Study	Weight	Elem	Middle	High
South Dakota 2006 PJ	.39	$3,723	$3,723	$3,723
Average of All Studies	.49	$4,975	$4,698	$4,375
Median of All Studies	.47	$3,868	$3,723	$3,868
Mode of All Studies[16]	NA	NA	NA	NA

Special Education

Special education staff provide services to students with disabilities typically categorized into three levels of severity: mild, moderate, and severe. Special education staff includes teachers, related services staff, and aides. Wyoming's funding model reimburses 100 percent of approved expenses, totaling $238.7 million in expenditures for 2017-18. For comparison purposes, recommendations were converted to per-pupil weights when possible.

- Thirteen studies using the EB method recommend the census-funding approach for serving students with mild or moderate disabilities. Under the census method a standard incidence rate, usually the statewide average, is applied to all schools to generate staffing and other resources.
    - The EB method funds 1.0 FTE teacher and 1.0 FTE aide for every 150 students enrolled in a prototypical school.
    - The EB method also recommends 100 percent state-funded reimbursement of the costs of low-incidence/high-cost students.
- Thirteen of the remaining studies recommend using student weights.
- Other studies roll special education into a larger at-risk formula or specify a dollar amount per student with disabilities.

Table 3.11
Studies Recommending Special Education Weights

State	Year	Special Education Weight
Wyoming Legislative Model	2018	1.64
Colorado	2003	1.15
Colorado	2006	1.15
Colorado	2011	1.49
Colorado	2013	1.49
Connecticut	2005	1.29
District of Columbia	2013	1.09
Kentucky	2004	1.23
Minnesota	2006	1.00
Montana	2007	1.06
Nevada	2006	1.10

[16] No recommended amount appeared more than twice.

State	Year	Special Education Weight
Pennsylvania	2007	1.30
South Dakota	2006	1.40
Tennessee	2004	0.84

Table 3.12
Comparison of Special Education Revenues per Student with Disabilities

Study	Weight	Amount
Wyoming Legislative Model	1.64	$18,603
Colorado 2013 PJ	1.49	$12,262
Connecticut 2005 PJ	1.29	$14,978
Montana 2007 PJ	1.06	$12,344
South Dakota 2006 PJ	1.40	$12,835
Average of All Studies	1.38	$14,204
Median of All Studies	1.40	$12,835
Mode of All Studies[17]	NA	NA

Instructional Facilitators/Coaches

Coaches, or instructional facilitators, play an important role in coordinating the instructional program and providing ongoing instructional coaching and mentoring for teachers. Twenty studies included a specific recommendation for instructional facilitator/coaches FTEs, typically on a per-school or per-number of students basis:

- Thirteen EB studies recommended between 0.5 FTE to 2.25 FTE per prototypical school. Their FTE per 100 students ranged from 0.35 FTE (Wisconsin Elementary) to 0.51 FTE (North Dakota '08 Elementary).
- Per 100 student FTEs ranged from 0.13 FTE in elementary schools, 0.09 FTE in middle schools, and 0.13 FTE in high schools (all Kentucky '04) to 0.51 FTE in elementary schools (North Dakota '08), 0.51 FTE in middle schools (North Dakota '08), and 0.50 FTE in high schools (multiple studies).

Table 3.13
Comparison of Recommendations for Instructional Facilitator/Coach FTE per 100 Pupil Students

Study	Elementary	Middle	High
Wyoming Legislative Model[18]	0.28	0.26	0.26
North Dakota 2008 EB	0.51	0.51	0.50
Colorado 2013 PJ	0.24	0.20	0.20

[17] No recommended amount appeared more than twice.
[18] Wyoming's instructional facilitator/coach allocation is currently scheduled to change to 0.16 per 100 students for ES and 0.14 per 100 students for MS and HS, per change enacted during the 2017 General Session.

Study	Elementary	Middle	High
Nevada 2006 PJ	0.50	0.40	0.32
Average of All Studies	0.40	0.39	0.38
Median of All Studies	0.50	0.45	0.45
Mode of All Studies	0.50	0.50	0.50

Gifted and Talented

Gifted and talented programming involves identifying students who will benefit from the enrichment program, accelerated learning, or both. Costs include teaching staff, enhanced curriculum, and other instructional materials. Fourteen studies included a specific recommendation for gifted and talented program funding:

- Three studies recommended a specific number of teacher FTEs per prototypical school.
- Nine studies recommended a dollar amount per pupil.
- One study (Montana '05) recommended a dollar amount per program participant ($487).
- One study (New Jersey '06) recommended a combination of teacher FTEs and a dollar amount per participant (0.20 FTE + $50).

Table 3.14
Comparison of Recommendations for Gifted and Talented Dollars per Pupil

Study	Amount Per Pupil
WY Legislative Model	$40.29
Illinois, Maine, New Jersey, North Dakota (2), Ohio,	$25
Kentucky 2004 PJ	$15
Average of All Studies	$24
Median of All Studies	$25
Mode of All Studies	$25

Professional Development

High-quality professional development opportunities are necessary to refresh and enhance educators' professional practices and develop expertise in new curricula and technologies. It is provided in various forms ranging from collaborative school-based practices, to college courses, to workshops and conferences. Most studies reviewed for this report recommended some combination of student-free days during the summer and school year for professional learning along with funding for trainers, materials, and travel. Twenty-eight studies included a specific recommendation for professional development:

- Four studies recommended a dollar amount per pupil.
- Six studies recommended a dollar amount per teacher or building.
- Twelve EB studies recommended providing an instructional facilitator, professional development days, and a per-pupil dollar amount (four at $50 per pupil and eight at $100 per pupil).

- Four PJ studies recommended both professional development days and a per-pupil dollar amount.
- Two PJ studies recommended professional development days only (Kentucky 2004 and California 2007).
- Per-pupil amounts ranged from $50 at all school levels (New Jersey 2006 and Kentucky 2003) to $275 at all school levels (all Connecticut).

Table 3.15
Comparison of Recommendations for Professional Development Dollars

Study	Elementary	Middle	High
Wyoming Legislative Model (Per ADM + 10 PD days)	$125.90	$125.90	$125.90
North Dakota 2008 and 2014 EB (Per pupil + 10 PD days)	$100	$100	$100
Colorado 2013 PJ (Per pupil + 6 PD days)	$200	$200	$200
Montana 2007 PJ (Per teacher + $1,000 per aide)	$2,000	$2,000	$2,000
Nevada 2006 PJ (Per teacher + 5 PD days)	$500	$500	$500
South Dakota 2006 PJ (Per teacher)	$1,000	$1,000	$1,000
Average of All Studies (Per pupil)	$115	$114	$112
Median of All Studies (Per pupil)	$100	$100	$100
Mode of All Studies (Per pupil)	$100	$100	$100

Instructional Materials

This funding model category includes textbooks, other instructional materials, and supplies. Some studies, such as the EB studies, also include library materials in this category. In most cases, the funding amounts were designed to support a regular adoption cycle for textbooks and other materials, typically about five years. Twenty-seven studies included a specific recommendation for instructional materials: all in the form of dollars per pupil:

- Dollar-per-pupil amounts ranged from $140 for elementary and middle schools and $160 for high schools to $400 for elementary schools, $450 for middle schools, and $600 in high schools.
- Fourteen EB studies recommended between $140 and $250 for elementary and middle schools and between $160 and $250 for high schools.
- Remaining studies used either the PJ or successful school district (SSD) approaches.

Table 3.16
Comparison of Recommendations for Instructional Materials Dollars per Pupil

Study	Elementary	Middle	High
Wyoming Legislative Model	$191.37	$191.37	$191.37
New Jersey, North Dakota 2014, Texas, Washington, Wisconsin – EB	$140	$140	$175
Colorado 2013 PJ	$225	$250	$310
Montana 2007 PJ	$350	$375	$450

Study	Elementary	Middle	High
Nevada 2006 PJ	$250	$300	$450
Average of All Studies	$224	$245	$286
Median of All Studies	$225	$250	$250
Mode of All Studies	$250	$250	$250

Technology

The technology category includes funding for computer hardware, networking equipment, software, training, service contracts, and the staff associated with maintaining and repairing the technology in place. Twenty-nine studies included a specific recommendation for technology:

- Twenty studies recommended a dollar amount per pupil.
- Seven studies recommended technology staff FTEs and a per-pupil dollar amount.
- One study recommended technology staff FTEs only (Tennessee).
- One study recommended technology FTE and a minimum number of computers per school (California).
- Per-pupil amounts ranged from $119 for elementary school, $156 for middle schools, and $134 for high schools (all Connecticut) to $407 elementary, $300 middle, and $479 high (all South Dakota).
- Twelve EB studies recommended $250 per pupil for all school levels.

Table 3.17
Comparison of Recommendations for Technology Dollars per Pupil

Study	Elementary	Middle	High
Wyoming Legislative Model	$250	$250	$250
North Dakota 2008 and 2014 EB	$250	$250	$250
Colorado 2013 PJ	$232	$319	$339
Montana 2007 PJ	$235	$266	$274
Nevada 2006 PJ (also includes 1 FTE per school)	$175	$175	$177
South Dakota 2006 PJ	$407	$330	$479
Average of All Studies	$250	$265	$275
Median of All Studies	$250	$250	$250
Mode of All Studies	$250	$250	$250

Assessments

The assessment category may incorporate funding for the costs of summative assessments, such as most state assessments or interim formative assessments, for monitoring student progress during the school year. The use of both types of assessments has become more important over time as districts and schools engage in data-based decision-making. Eighteen studies included a specific recommendation for assessments, all on a per-pupil or per-school basis:

- Five EB studies recommended $25 per pupil, while one study recommended $30 (North Dakota '14), and another (Maine) $170 for K-8 and $205 for ninth through twelfth grades (including instructional materials).
- One study (South Dakota) recommended $2,000 per school for all levels. On a per-pupil basis, this amount equals $10.42 for elementary schools, $10.36 for middle schools, and $7.81 for high schools.
- Per-pupil amounts ranged from $12 per pupil for all school levels (Connecticut) to $50 per pupil for all school levels (Montana '05).

Table 3.18
Comparison of Recommendations for Assessment Dollars per Pupil

Study	Elementary	Middle	High
Wyoming Legislative Model	$25	$25	$25
North Dakota 2008 & 2014 EB	$25/$30	$25/$30	$25/$30
Colorado 2013 PJ	$25	$25	$25
Montana 2005 PJ	$50	$50	$50
Nevada 2006 PJ	$175	$175	$177
South Dakota 2006 PJ	$10.42	$10.36	$7.81
Average of All Studies	$26	$26	$28
Median of All Studies	$25	$25	$25
Mode of All Studies	$25	$25	$25

Central Office Administration

Every public school district requires a central office administration with professional and classified staff dedicated to managing curriculum, student services, and district and school operations. A number of earlier studies simply carried over current spending for district administration rather than make a specific recommendation. Seventeen studies made specific recommendations for central office support:

- Nine EB studies provided recommendations for central office professional and classified FTEs for prototypical districts and a per-pupil amount for materials and supplies. One EB study recommended a per-pupil amount for both personnel and non-personnel costs.
- Eight PJ studies recommended only a per-pupil amount for both personnel and non-personnel costs. One PJ study included a recommendation for staff FTEs.

Table 3.19
Comparison of Recommendations for Per-Pupil Funding for Central Office Administration

Study	Per Pupil Amount
Wyoming Legislative Model	$752
North Dakota 2008 EB	$819
North Dakota 2014 EB	$733

Study	Per Pupil Amount
Colorado 2003/2011 PJ	$1,018/$1,257
Montana 2007 PJ	$733
Nevada 2006 PJ	$1,366
Average of All Studies	$733
Median of All Studies	$738
Mode of All Studies[19]	NA

Other Funding Model Elements

At the Select Committee for School Finance Recalibration meeting held in Casper, Wyoming on November 29 through December 1, 2017, members of the Select Committee asked APA to review three additional Funding Model elements: 1) staff salaries, 2) funding for career and technical education programs, (CTE) and 3) recommendations regarding effective practices for educating students with disabilities. Each of these are discussed below.

Staff Salaries

Almost all of the studies reviewed by APA used current average salaries to estimate the cost of their adequacy recommendations. Only one report, the evidence-based study completed for Arkansas in 2006, mentioned an alternative salary level. This study noted that the Arkansas State Legislature recommended using a teacher salary commensurate with the average salaries of surrounding states in legislation (Act 59), enacting recommendations from a 2003 adequacy study. The study went on to recommend using this same salary benchmark, updated to the current year, when implementing its recommendations. It is possible that separate salary studies were undertaken in these states, but their results were not included in the recommendations of these studies.

Career Technical Education

In general, specific recommendations for CTE programs were not included in these studies except for those using the evidence-based method. The evidence-based model includes CTE teachers in its recommendation for elective teachers at the high school level, although it does not recommend a specific number of FTEs. It also recommends $10,000 per CTE teacher for specialized equipment and materials. Two of the professional-judgment studies (the 2007 Montana and 2011 Colorado studies) included similar recommendations. In both cases, CTE teachers were included in the studies' elective teacher recommendation for high schools (but also did not include a specific number of FTEs) and per-pupil amounts for materials and equipment: $100 per high school pupil for moderate-sized districts (501 to 1,200 students) in the Montana study, and $80 per high school pupil in the Colorado study.

Special Education Instruction

The studies reviewed for this report also did not generally recommend specific strategies or approaches for special education instruction. The norm for adequacy studies is to recommend an appropriate

[19] No recommended amount appeared more than twice.

number of staff and other resources required for implementing an adequate education program. The studies typically are silent on specific instructional approaches, although this may be part of the discussion of professional judgment panels as they think about staffing and other resource requirements. However, panels in recent years do take the response to intervention approach into consideration when determining resource needs for early intervention for at-risk and special education students. The evidence-based approach is the most explicit in aligning its recommendations for high-quality differentiated instruction, extended learning time, tutors, and regular formative assessments with the RTI model.

The Impact of Other Uncontrollable Costs

APA was asked to analyze the impact of other uncontrollable costs affecting school districts, such as district size and district and school geographical isolation. This analysis will include a review of the funding model's small school adjustment, external cost adjustment, and payments under Wyoming State Statutes 21-4-401, *Transportation or Maintenance for Isolated Pupils*. This analysis will consist of a review of the most recent research literature on their impact and best practices, including approaches used in other states for compensating affected districts.

Uncontrollable costs are additional or higher costs experienced by districts that are caused by circumstances beyond districts' control. Wyoming's current funding model adjusts districts' revenues to compensate for uncontrollable costs through several mechanisms, including the state's small school adjustment, external cost adjustment (inflation adjustment), and payment for transportation or maintenance for isolated pupils. Our analysis includes a review of recent research and best practices along with a fifty-state review of each subject.

Small School or District Funding

Some states have adjusted their school funding formulas to take into account the size of a school or district. States have made these adjustments to their funding formulas because small schools or districts tend to face higher per-pupil costs to deliver educational services. Data from the United States Census shows that small districts, those with less than 3,000 students, have per-pupil expenditures that are $1,901 (16.6 percent) above the national average.[20] There are several reasons why small districts tend to face higher per-pupil costs, but most center on the fact that larger districts can take advantage of economies of scale and small districts cannot. Some states provide additional funding to all of their small districts; for example, Oklahoma provides any district with 529 or few students with additional funding.[21] However, a number of states only provide additional funding to their small districts that are also geographically isolated. These geographically isolated small schools are often referred to as "necessarily small" schools to acknowledge that some schools, though small, must exist to serve students in certain communities.

[20] Griffith, Michael. *In Education Funding Size Does Matter*. 2017. https://www.ecs.org/in-education-funding-size-does-matter/
[21] Oklahoma Statutes: Section 70-18-201.1(B)(3)(a)

Small School or District Funding Research

There is consensus in the academic research that small schools or districts have a higher cost of delivering educational services to their students.[22] However, there is little consensus in this research about the "…ideal student enrollment to minimize cost per student or maximize student achievement".[23] A 2002 study found that districts with less than 500 students tend to produce higher costs.[24] This same study found that the optimal size for elementary schools appears to be between 300 and 600 students and the optimal size for a secondary school appears to be between 600 and 900 students.[25] A California study found that very small districts, ones with less than 100 students, face higher operating costs. However, this same study showed that there were "not large" differences in spending between small districts (Over 100 to 1,000 students) compared to medium-sized districts (1,001 to 10,000 students).[26] A study of Oregon's public schools found that there are increased costs for districts with less than 2,000 students, high schools with fewer than 300 students and elementary schools with 100 students or fewer.[27]

State Policies for Funding Small Schools or Districts

Wyoming's funding model provides additional funding to both small schools and small school districts. To qualify for this additional funding a school must have 49 or fewer students and a district must have fewer than 243 students. If all of the schools in a district have 49 or fewer students, then each of the schools and the district qualify for additional funding. APA reviewed the state school funding formulas in the other 49 states and found that 17 states, in addition to Wyoming, provide additional funding to all small schools or districts in their state. Of these 17 states, six provide additional funding to small schools, 10 provide funding to small districts and one provides it to both small districts and schools. All of the 17 states that provide additional funding to small schools or districts have a more generous definition of what constitutes a small school or district than Wyoming. In these states, the definition of what constitutes a small school ranges from 1,022 students (Alaska) to 100 students (Vermont and Washington). The definition of what constitutes a small district for funding purposes ranges from 7,500 students (Louisiana) to 300 students (Washington). Three states have qualifications other than district or school size for additional funding. New York provides additional funding to schools with seven or fewer full-time teachers and Michigan and West Virginia provide additional funding based on the number of students per square mile. For a full description of each states' small school funding program see Table F1 in Appendix I.

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[22] Rooney, Kathryn and John Augenblick. (2009). *An Exploration of District Consolidation*.
[23] Ibid, page 11.
[24] Andrews M, Duncombe W, Yinger J. (2002). *Revisiting economies of size in American education: Are we any closer to a consensus?* Economics of Education Review.
[25] Ibid
[26] Legislative Analyst's Office. (2011). *How Small is Too Small? An Analysis of School District Consolidation*. http://www.lao.ca.gov/reports/2011/edu/district_consolidation/district_consolidation_050211.aspx
[27] Oregon Department of Education, School Finance, Data and Analysis Office. (2002). *The Cost of Operating Small Schools in Oregon*.

State Funding for Isolated Schools

While Wyoming currently provides all small schools or districts with additional funding, some states only provide additional funding to small schools or districts if they are geographically isolated. APA found that 18 states currently provide additional funding to isolated small schools or districts. Nine of these states provide additional funding to isolated schools, six provide it to isolated districts, and three states provide additional funding to both isolated schools and districts. Thirteen states have a school or district size requirement to qualify for isolated funding. Most states then have a requirement in addition to enrollment size to qualify for isolated funding this can include the following: the distance to the nearest school, the density of the district, travel time for students, the presence of a geographic barrier (river, mountain or island), or the geographic size of the district. Some states use a mix of these different measures. For example, to qualify as an isolated district in Arkansas a school must be at least 12 miles from the nearest high school, it must have a density ratio of less than three students per square mile, it must be at least 95 square miles in size, and it must contain a geographic barrier such as a river. There appears to be no consensus between states about what qualifies as small, isolated school or district. State requirements for school size ranges from 97 students (California) to 600 students (Utah). The size requirements for districts ranges from 250 students (Michigan) to 8,500 students (Oregon). There are four states (Georgia, Idaho, Oklahoma, and Washington) where a district or school can only qualify for isolated designation through a determination by the state. For a full description of each states' isolated school funding program see Table I2 in Appendix I. Appendix I also includes a list of references to applicable state statutes and other resource materials.

External Cost Adjustment (Inflation)

Wyoming law requires the state to annually adjust funding to districts "…to provide for the effects of inflation" (W.S. 21-13-309(o)). This annual inflationary adjustment is known as the "External Cost Adjustment" in Wyoming. A 2015 study by Picus Odden & Associates (POA) recommended that the state use multiple cost indices to determine the annual rate of inflation in the state's funding formula.[28] Table 20 lists the various cost indices that the POA study recommended:

Table 3.20
Recommended External Cost Adjustment Indices

Funding Area	Professional Staff	Non-Professional Staff	Supplies & Materials	Energy
Recommended Cost Indices	Wyoming-specific Comparable Wage Index	Wyoming-specific High School Comparable Wage Index	Producer Price Index for Office Supplies & Accessories	Producer Price Index for Commercial Electric Power (weighted at 44.1%) and the PPI for Commercial Natural Gas (weighted at 55.9%)

[28] Odden, Allan and Lawrence O. Picus. (November 2015). *2015 Wyoming Recalibration Report. Picus Odden & Associates*. p. 33.

In 2012, the Legislature also adopted a process for monitoring the cost basis of the funding model that uses state, regional, and national data to assess the potential cost pressures in the four major resource areas (professional staff, non-professional staff, supplies and materials, and energy). The process includes the four indices shown above; a set of indicators for each of the four cost areas, such as trends in teacher labor markets, district hiring, and teacher turnover; and an annual analysis of district resource utilization compiled by the Wyoming Department of Education. Results of this monitoring process are used to determine whether an inflation adjustment is needed in any of the four cost areas and the appropriate level of the adjustment.

APA reviewed other states' funding formulas and found that, in addition to Wyoming, eight other states have a mandated annual inflationary amount in their funding formula. In six of these states (Arizona, California, Illinois, Kansas, and Maryland) the inflation amount is for total education spending in the state. In Colorado, the inflationary amount only impacts the state's base funding program and not separate categorical programs that exist outside of the primary formula. In Oregon and Washington, the inflationary mandate only impacts the calculation of employee salaries within the state's primary funding formula. Like Wyoming, Kansas adopted an annual cost adjustment as a result of litigation against the state. The other states adopted an annual inflationary amount either through legislative action or because they were forced to do so through a voter initiative (see Table 3.21 below).

Table 3.21
State Inflation Cost Adjustments

State	How Policy was Initiated	How Policy was Established	Inflationary Measure
Arizona[29]	Voter initiative	State constitution	Two percent, or the change in the Gross Domestic Product price deflator, whichever is higher
California[30]	Voter initiative	State constitution	Either a share of state General Fund revenue (about 40 percent) or student attendance and California per capita personal income
Colorado[31]	Voter initiative	State constitution	Consumer price index for Denver-Boulder
Illinois[32]	Legislative action	State legislation	Not Defined
Kansas[33]	Legislative action due to a court ruling	State legislation (Starting in FY 2018-19)	Consumer price index for all urban consumers for the Midwest

29 Arizona State Constitution: Article 11, Section 11 and Arizona Revised Statute 15-901.01.
30 California Legislative Analyst's Office. (January 2017). *A Historical Review of Proposition 98*. P. 5.
31 Colorado Constitution: Article IX, Section 17 and Article X, Section 20.
32 Illinois Senate Bill 1 of the 2017 legislative session.
33 Kansas Senate Bill 19 of the 2017 legislative session.

State	How Policy was Initiated	How Policy was Established	Inflationary Measure
Maryland[34]	Legislative action	State legislation	The lesser of the Consumer Price Index for the Baltimore–Washington region, the implicit price deflator for state and local governments, or 5 percent
Oregon[35]	Voter initiative	State legislation	The Consumer Price Index for All Urban Consumers of the Portland, Oregon
Washington[36]	Voter initiative	State legislation	Implicit Price Deflator

Transportation or Maintenance for Isolated Pupils

Some students are located in such remote or isolated areas of a state that it is more efficient to reimburse their families for the cost of transporting them to or from school instead of providing them with traditional transportation services. The state of Wyoming provides families of non-special education students (See note below) with a payment in lieu of transportation when the family resides in an isolated location and can prove that living in that location is necessary for the family's financial well-being (WY State 21-4-401). APA found that five other states provide some payment to families of non-special education students in lieu of transportation. It is not surprising that four of these states are sparsely populated and located in the West (Idaho, Nebraska, South Dakota, and Utah), with the fifth state being Ohio.

The eligibility requirement in three of the identified states is simply the distance from the student's home to their school or bus stop (Idaho, Nebraska, and South Dakota). Ohio and Utah have requirements similar to Wyoming's that look not just at distance, but also require a determination that it is more practical to provide this payment instead of providing students with traditional transportation. Wyoming reimburses qualified families for the number of miles driven minus two miles each way for the round trip. Wyoming's reimbursement policy is slightly more generous than Nebraska and South Dakota, which exempt the first 3 miles and 5 miles from a round trip respectively. Wyoming's policy is a little less generous then Idaho's and Utah's, which reimburses families for all miles driven. For each eligible mile driven, the state of Wyoming reimburses families at the U.S. Internal Revenue Service's (IRS) allowable mileage rate, which in 2017 was 53.5 per mile.[37] Idaho, Nebraska, and South Dakota all make use of the IRS allowable rate; the only difference is that Idaho also provides an additional funding amount of up to $10 per vehicle per year. Utah allows their districts to reimburse families at a rate of their choosing as long as it is in between 35 cents a mile and the IRS allowable rate. In Ohio, school districts must provide a flat annual reimbursement to qualified families of between $250 and the average per-pupil transportation expenditures in the state from the previous year. In FY 2016-17, that equated to $924.47. Table 3.22 summarizes the policies in each of these states.

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[34] Augenblick, Palaich & Associates. (2016). *Final Report of the Study of Adequacy of Funding for Education in Maryland*. Denver, CO, page xxii.
[35] Oregon Revised Statutes 327.006.
[36] RCW 28A.150.260(8)(a) and Enrolled House Bill 2242 of the 2017 legislative session.
[37] Internal Revenue Service News Release, IR-2016-169. December 13, 2016.

Table 3.22

States Providing Payments In Lieu of Transportation

	Eligibility Requirements	Reimbursement	Rate
Idaho[38]	Must live more than 1.5 miles from bus stop/school	All miles on approved route	Up to $10 per vehicle each year plus the IRS allowable mileage rate
Nebraska[39]	Must live more than 4 miles from school	Travel in excess of 3 miles each way	IRS allowable mileage rate
Ohio[40]	If a district determines that it is impractical to transport the pupil under their current transportation system	Flat rate	If the district chooses to make use of this system, it must pay parents at least $250 for the full year but not more than the average cost of transportation ($924.47 in FY 2016-17)
South Dakota[41]	Must live 5 miles or more from the school	Travel in excess of 5 miles each way	IRS allowable mileage rate
Utah[42]	As long as it is more efficient than providing traditional school transportation	Full mileage to either the school or the nearest bus stop whichever is shorter	At least 35 cents per mile but not more than the IRS allowable mileage rate
Wyoming[43]	The family resides in an isolated location and can prove that living in that location is necessary for the family's financial well being	Travel in excess of 2 miles each way	IRS allowable mileage rate

Housing and Lodging Costs

The state of Wyoming has recognized that in some instances a family's home is located too far from a school for the student to make the trip on a daily basis. In these cases, the state provides monthly maintenance payments that allow families to find lodging closer to the student's school. The amount of the maintenance payment is the lesser of a family's actual lodging costs or the transportation payments that would have been made to the family under the payment in lieu of a transportation program. APA found that Idaho, Pennsylvania, and Utah also provide these payments to families of general education students. Idaho provides parents with reimbursement for lodging as long as the student lives at least 1.5 miles from school and the student "…*cannot be transported in any manner herein authorized*".[44] In Utah, a family can be reimbursed for room and board costs "… *if a student lives more than 60 miles (one way) on well-maintained roads from the student's assigned school*".[45] Pennsylvania does not have a distance requirement to qualify for housing costs, it simply requires the cost. As long as the expense has

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38 Idaho State Rules: 33-1503.
39 Nebraska Revised Statute 79-611.
40 Ohio Department of Education, Memo to Districts: Payment in lieu of transportation (Type IV) for school year 2016-17. February 10, 2017.
41 South Dakota Codified Laws Chapter 13-30.
42 Utah Education Department rule 277-600-7.
43 Wyoming statute: 21-4-401(e).
44 Idaho state law: 33-15-1503(b).
45 Utah Education Department rule 277-600-7(i).

been approved by the district then they will be reimbursed by the state for the state's share of transportation costs for all students.[46]

Note on Transporting Special Education Students

The federal Individuals with Disabilities Education Act (IDEA) requires all school districts to provide identified special education students with appropriate transportation to and from school.[47] To meet this requirement districts can choose to provide the necessary transportation themselves, they can contract it out to another provider, or they can make a payment in lieu of transportation to the student's family.[48] Due to this federal policy, all fifty states are required to allow their school districts to provide payments in lieu of transportation for special education students. The state systems described above are for transporting non-special education students to school.

[46] Pennsylvania Administrative Code: § 23.37.
[47] Federal law: 34 CFR 300.34(C)(16).
[48] LRP Publications. (2003). *An Overview of Special Education Transportation: A Primer for Parents and Educators*. Palm Beach, California. Page 11.

IV. Stakeholder Feedback

Key Themes from Stakeholder Feedback: Educational Program

The following set of stakeholder feedback questions was used in the interviews, practitioner panels, and an online survey:

Educational Program

5. What does it mean to be postsecondary and workforce ready in Wyoming?
6. How well does Wyoming's current educational program prepare students to be postsecondary and workforce ready?
    a. Are there any areas or requirements that need to be added or emphasized?
    b. Are there any areas or requirements that are unnecessary or overemphasized?
7. Are all schools or districts able to provide the opportunity for students to meet the requirements of the Hathaway Scholarship program?
8. How well do Wyoming's current requirements for special needs students (special education, English Language Learners, economically disadvantaged, gifted and talented) support the success of these students?

Key themes are presented below.

Interviews

Many interviewees said that to be considered postsecondary and workforce ready, Wyoming students should be prepared for whichever path they choose. This included attending a postsecondary institution, joining the military, entering a career training or certification program, or immediately entering the workforce. Interviewees added that Wyoming students should not be just ready, but competitive. Further, interviewees stressed the importance of having a 21st century workforce to attract companies in new industries to Wyoming, which would help reduce the impact of mineral boom and bust cycles.

Overall, interviewees felt the educational program, as defined by the basket of goods and services, was generally the right set of skills and knowledge that students needed to be postsecondary and workforce ready. There was some discussion of a need to review and modernize the language basket, but few changes were recommended. Many interviewees stressed the importance of CTE offerings, in both "traditional" Wyoming industries and emerging technology industries. Relatedly, one potential area of change, particularly from the perspective of state-level stakeholders, was to either add computer science/coding or revise the applied technology component to address it. This was related to ensuring Wyoming students are prepared for emerging technology careers and creating a 21st century workforce in the state. However, interviewees from schools and districts expressed caution. While many agreed with the need for increased emphasis on technology instruction, they also identified potential challenges to being able to hire the trained staff that would be needed. Interviewees also strongly emphasized that it would be difficult to add new requirements to the basket while at the same time cutting funding. More than one interviewee said the push for coding felt like an unfunded mandate. Other areas of potential change included eliminating the K-2 language and cultures requirement and eliminating (or again, at least modernizing) keyboarding.

Many interviewees also expressed concern that postsecondary readiness was currently being overemphasized at the expense of workforce readiness. One key reason for this was the requirements of the Hathaway Scholarship program. According to the interviewed stakeholders, the Hathaway Scholarship program was originally intended to be just that, a scholarship program, but it has ultimately had a broader impact on student, school, and district choices. Since eligibility for the Hathaway Scholarship is a component of the accountability system, districts face pressure to ensure all students are eligible, regardless of if the student is interested in pursuing postsecondary education. School and districts are making staffing and course offering decisions based on the opportunities they need to provide students to be eligible (for example, providing a fourth year of math).

Schools need to be able to offer enough sections to ensure all students can take the classes they need, which means they need to redirect teaching staff resources and reduce opportunities in other areas. Interviewees noted that this is forcing a decrease in elective offerings, including arts and CTE, both because of the need to redirect staff resources and because students have less time in their schedule to take the other offerings. A number of interviewees shared anecdotal stories about students having to choose between their interests (such as art) and pursuing the scholarship money, as well as students taking fewer challenging courses, such as AP, in order to protect their GPA and scholarship eligibility. The fourth year of math requirement was also a source of debate, with many arguing in favor of applied math courses instead of theoretical math; though some mentioned challenges related to having certified teachers that are qualified to teach these courses.

Some interviewees were concerned rural schools face challenges in providing the requirements of the basket of goods and services and had difficulty in providing equity in course offerings, including the higher-level courses needed for Hathaway. A number of interviewees suggested the use of distance or virtual classes to supplement what the schools provide locally, but stressed these options still require staff time and were not necessarily the best way to provide instruction. In addition, a recent legislative change, which requires all courses to be taught by Wyoming-certified teachers, has created a barrier for purchasing needed courses from outside the state.

Finally, interviewees indicated they felt special education students were well served in Wyoming and that extended opportunities for at-risk students have been valuable to promoting their success. ELL students and gifted students were not seen to be as well served.

Practitioner Panels

Thirty-four percent of practitioner panel speakers want the educational program to remain unchanged. Participants in the practitioner panels feel very fortunate to have such a well-rounded set of resources and feel they cannot afford to have anything taken out of the educational program. The common core of knowledge and the common core of skills are both important. The common core of skills makes

Wyoming students more employable and able to succeed in a postsecondary setting. According to educators in Wyoming, every student in Wyoming today deserves the same type of education as students in the past.

Sixteen percent want to make sure electives, such as music, art, physical education, and foreign languages, are not cut from the educational program. Individual speakers said the arts and foreign language classes reinforce what is taught in the common core of skills. Arts and foreign language courses promote problem solving, foster creativity, and support the development of many other life skills. Similar to the arts, speakers touted the benefits of band and physical education. For example, physical education is shown to increase test scores and health, support beneficial classroom behavior, and improve mental health.

Fourteen percent of the educators who spoke at the practitioner panels across the state want there to be a higher emphasis on CTE. Some educators argued the emphasis on the Hathaway Scholarship has taken away from the CTE classes offered in schools. Some speakers said Wyoming has opportunities for students to work for many different industries, which may not require postsecondary education. They contended that the state needs to be able to prepare the students for these industries through CTE program offerings.

Ten percent of educators participating in the panels cited legislative cuts as having an effect on the basket of goods. Every time the legislature cuts spending, the cuts end up impacting how the basket of goods is offered. The cuts have a larger impact on the smaller schools/districts in the state who already struggle to ensure all of the required course offerings, including Hathaway, are provided.

Ten percent of educators who spoke believed that special education resources need to improve for students with severe needs. For example, there is no designated school in Wyoming for the deaf and the blind. Students with severe special needs require many more services than the small districts can offer in order for them to live a life outside of their small towns.

Some educators brought up additional topics in the practitioner panels that were not as frequently heard, such as the need for mental health services for their base student population. They said mental health issues are increasing among children in Wyoming schools, and the schools need more supports. Finally, the certification process was a frustration for many educators, which they said hindered the ability of districts to recruit high-quality teachers.

Survey

What does it mean to be postsecondary and workforce ready in Wyoming?

Respondents were slightly more focused on addressing workforce readiness, but did discuss what both postsecondary and workforce readiness meant for students in Wyoming. Respondents defined college readiness as the ability to succeed in college without remediation, while workforce readiness was defined as having the skills to start and maintain employment in an entry-level job. A number of respondents also distinguished career readiness from workforce readiness, defining career readiness as knowledge of a specific trade. Many respondents also indicated there should not be a distinction between the two and that students should have the ability to choose either or be prepared for any opportunity that becomes available. Respondents stressed that “soft skills,” such as showing up on time, work ethics, accountability, and collaboration, were crucial to readiness, as these skills will help students in life, academics, and employment. Further, some respondents emphasized the importance of students being well rounded for both postsecondary and workforce readiness.

How well does Wyoming’s current educational program prepare students to be postsecondary and workforce ready?

The majority of respondents (educators and parents/community members) felt the education system leaves students generally prepared for postsecondary education, but that workforce readiness is not being sufficiently addressed. Further, many believed that postsecondary readiness has been emphasized at the expense of workforce readiness. Respondents often argued that not every student is going to go to college, so the educational program should ensure they can be successful in whatever path they pursue. To meet this need, respondents frequently suggested the need for more CTE courses and workforce opportunities. This suggestion was made for both the “traditional” CTE fields (such as agriculture or mechanics) and in technology (with some specific mentions of computer coding). Relatedly, a number of respondents stressed that there should be more applied math and science. While not noted often, a number of educators indicated that an unintended effect of the Hathaway Scholarship program was a greater emphasis on postsecondary versus workforce preparation.

The second most frequent response was that there was a need for a greater emphasis on skills to prepare students for the real world and future employment. These skills included personal finance, life skills, work ethics and accountability, critical thinking, collaboration and interpersonal relationships, and problem solving.

Feedback on this question did not generally involve adding anything new to the basket of goods and services, and instead promoted increased emphasis on existing elements (CTE, applied technology [assuming STEM and computer science are an extension of this category], financial literacy, and soft skills) and ensuring that no current elements of the basket (particularly the arts and other electives) were cut. Many stressed how important it was that students were well-rounded through a variety of offerings. Few respondents indicated that anything should be removed from the basket.

Are all schools or districts able to provide the opportunity for students to meet the requirements of the Hathaway Scholarship program?

There was not a broad consensus about whether all schools or districts are able to provide the opportunity for students to meet the requirements of the Hathaway program. Among educators who answered this question, over half generally agreed that all schools or districts are able to provide the opportunity for students to meet the requirements of the Hathaway Scholarship program, about 20 percent do not believe the opportunity is available statewide, and a quarter did not know. Many educators believe their district provides the opportunity, but were unsure about other districts across the state. The view from non-educators is slightly less positive, with less than half generally agreeing that all schools or districts provide the opportunity. Seventeen percent believe the opportunity is not provided statewide, and a larger proportion of respondents (about 35 percent) did not know. Very few indicated they were unfamiliar with the program.

There was broad concern among the respondents regarding the ability of small school districts to provide the necessary opportunities. Respondents particularly noted challenges for small, rural districts in meeting the foreign language requirements, as well as having the required highly qualified teachers and on-site opportunities for students to meet the requirements. Respondents believed there is inequity in the diversity of options for students pursuing the program, often between the larger and smaller districts. For example, a small district may only offer one foreign language, while a larger district may offer multiple foreign languages from which students may choose.

There is a belief that school districts are "doing their best," but concern voiced throughout the survey that with any additional cuts to funding, districts may have a hard time maintaining the needed opportunities for students to meet the scholarship requirements.

The survey also revealed the following themes on the impact of the scholarship requirements:

- There is a belief that the Hathaway Scholarship program assumes every student is headed to a four-year college, and might negatively impact opportunities for non-college bound students to participate in vocational and other career-training opportunities, with such a heavy focus on the program.
- Respondents voiced concern that the program can impact elective options provided by the school or district, and that the only electives offered were those required by the Hathaway Scholarship program (this was a particular concern for small districts and schools).
- Respondents supported the use of technology and cross-district partnerships, particularly in rural areas, to provide opportunities for all students to meet the scholarship program requirements.

How well do Wyoming's current requirements for special needs students (special education, English Language Learners, economically disadvantaged, gifted and talented) support the success of these students?

While survey respondents were asked about requirements for different student categories that fit under the umbrella of special needs (special education, ELLs, economically disadvantaged, gifted and talented), the majority focused their answers on special education. Of that group, respondents were divided on whether the needs of special education students were being met. Educators were significantly more likely to indicate that the needs of special education students were being met in Wyoming and that the state's requirements supported the success of these students, with some respondents going even further, suggesting Wyoming is one of the best states in the country with regards to special education students. The other half of respondents, largely parents, felt special education needs were not being met, mainly due to issues of resource allocation (both funding overall and specific resource elements, such as teachers and technology).

Another key theme was that it is more difficult for smaller districts to meet the current requirements for special needs students (across student groups). This also applied to smaller schools within larger districts. Respondents believed there was not a fair distribution of resources within the state and within school districts.

Key Themes from Stakeholder Feedback: Funding Model

Interviews

Across the interviewed stakeholder groups, the general consensus was that the funding model worked well, but that recent reductions were making it more difficult for schools and districts to provide the educational program. Overall, they found the system to be transparent and responsive, and stressed how essential the flexibility of the block grant was to their districts and their ability to serve students in the best way they could. Recent funding cuts, particularly related to the external cost adjustment, have been an issue and are negatively impacting districts. They expressed concern over future cuts and unease about the uncertainty of their funding. Interviewees explained that having predictable and sustainable funding is crucial to being able to hire staff and provide programs and services. To that end, interviewees also expressed the need for more stable revenue sources, indicating that the issue of education funding was not related to the funding model itself, but to how it is funded. More than one interviewee suggested it was time to consider raising taxes or identifying other tax sources.

Salaries were another key area of concern for interviewees. Many emphasized that they have to pay salaries that are much higher than the average salaries in the model to attract and retain high-quality teaching staff. Districts have been making tradeoffs between the resources recommended in the model, particularly class sizes, and providing higher salaries. Many felt that their ability to pay more than surrounding states has led to the success they have seen in Wyoming. Further, interviewees highlighted that other states are getting more competitive in their starting salaries, so if they have to reduce salaries to the level in the model, they will lose staff to other states. A number of interviewees said that their districts are already starting to see vacancies at schools, which means schools and districts have to settle for whoever applies and not the highest quality.

Interviewees believed the 100 percent reimbursement approach to funding special education was the best way to support these students. Many interviewees expressed pride in how well they serve special education students in Wyoming compared to other states, which they attributed to having an adequate level of funding. Some interviewees also believed that Wyoming had fewer lawsuits and saved money by providing the level of services needed for students. It was also highlighted that due to federal laws around Maintenance of Effort (MOE) of special education funding, the state would not be able to fund less than current levels without a waiver from the federal government. Interviewees believed there could be costs savings by reducing identification rates through providing a well-funded base with meaningful response to intervention systems in place and offering early intervention/early childhood education. A decrease in the number of identified special education students is an allowable reason for reducing required MOE. Finally, it was noted that while the 100 percent reimbursement model was supported, it did create a cash flow issue for smaller districts if a high cost student enrolled in their district (since they would have to fund that student's needed services out of pocket to be reimbursed in the future).

Some interviewees indicated that there could be further cost savings through shared services, such as through the existing Board of Cooperative Educational Services (BOCES) structure or working cooperatively with other districts. The current BOCES structure allows districts to raise up to one-half mill levy to fund their BOCES, but only 40 percent of districts do so. Instead, they typically hire their own staff and the three BOCES that exist now primarily provide residential placements instead of being more robust regional special education service providers, as is the case in other states. The current 100 percent reimbursement model provides little incentive to use either the BOCES or work with another district, which can lead to higher special education costs. Many interviewees expressed reservations about sharing staff that work directly with students, due to lost time for traveling between schools and districts ("windshield time").

However, interviewees thought there could be sharing possibilities for "back room" services that do not involve working directly with students, such as shared maintenance, IT, business services (such as HR and procurement), professional development, common purchasing, and shared administration staff. Many districts are already sharing services, particularly around professional development.

A number of areas were noted in more than one interview as being underfunded: CTE, gifted and talented, ELL, insurance, maintenance (particularly groundskeepers), food service, and early childhood education. Several interviewees also noted athletics was a high-cost area that schools and districts spent more on than was allocated and they felt hampered in their ability to have any cost savings in this area due to the requirements of athletic associations, including the high cost of transportation to play assigned teams, and community expectations.

Practitioner Panels

The consensus in all the funding model feedback sessions was to maintain the current level of funding. It ensures sustainability and stability for districts. Further, the block grant model is the most efficient way for such a diverse set of school districts across the state to meet their diverse needs. Several educators stated that it is important to them to be good stewards of public dollars and they do not spend taxpayer money frivolously. Educators are open to looking at efficiencies, but not at the cost of compromising the quality of education. Areas that were highlighted as potentially costly but crucial included: (1) keeping class sizes small to maintain the quality of education in Wyoming, especially for at-risk and special education students; addressing rural issues, including the cost of substantial travel, ability to give students the same services, fluctuating enrollment, and remoteness and isolation, and (3) the salaries needed to attract and retain quality staff, as the state does not produce enough teachers of its own and recruiting from outside states is necessary. Most superintendents that spoke indicated that the recent budget cuts have already decreased resources; districts that were saving money on their own felt further penalized by the budget reductions. About 10 educators spoke about the regional cost adjustment and would like to see it held at 100 percent (the statewide average). Several mentioned the cost of bringing goods and materials into remote and isolated locations should be reflected in this adjustment. Participants also expressed how important fully funding the external cost adjustment was to their schools and districts.

Additionally, participants spoke in favor of the 100 percent reimbursement approaches for special education and transportation, feeling that both were necessary and should be maintained. The majority of educators who spoke addressed special education funding. About three educators in different meetings said their districts already have to save money by using psychologists, speech pathologists, and other specialists over video conference and it is not an ideal manner to deliver services. Participants felt that transportation reimbursement was particularly important to small rural districts that have to provide a lot of transportation just to meet basic student needs. They noted that rural roads also wear on vehicles more. Consolidation was discussed by about a dozen educators and most said that it would not actually save money for the state.

CTE funding was also addressed in a number of ways. Wyoming schools have CTE comprehensively in school unlike other states and it is considered a positive aspect of the educational program that should continue to be funded. Finding qualified CTE teachers is very challenging, noted a couple of educators. Not related to funding, but still relevant, it was suggested that the Hathaway Scholarship should be opened to vocational training to be fair to all Wyoming students.

The following items were identified as underfunded areas by at least one person: utilities, facilities, maintenance, groundskeepers, technology, ELL, elementary counselors, and school resource officers. Participants also shared potential efficiencies and cost savings that can be explored: bus leasing, reducing reporting requirements, cooperative purchasing programs, and sharing professional services. Revisiting the new requirement for special education teachers to be included in workers' compensation insurance should be addressed and is a possibility for savings.

Survey

As noted, the survey participants were asked to answer the four key guiding questions in this area. Feedback for each is provided separately below. However, there was also feedback across the questions regarding the impact of funding cuts. Survey respondents highlighted the negative impact that the past funding cuts have had on students, schools, and districts, and expressed concern over what further cuts would mean for the education provided in Wyoming. Further, respondents suggested that the real issue of the finance system is not the model itself, but the way it is funded, indicating that the state needs to find a more stable funding source.

How responsive do you feel the current funding model is to the different needs of students, schools, or districts?

Respondents were divided on how responsive they believed the current funding model to be, with roughly an even number of respondents that felt it was or was not responsive. Respondents were far more likely to think it *is responsive* if they were educators and far more likely to think it is *not responsive* if they were parents. Many of the respondents who said the system is responsive also said that the recent funding cuts are hurting the state and limiting the ability of the funding model, and therefore schools and districts, to be responsive. The flexibility of the block grant model was also stressed as essential for responsiveness.

Areas where some respondents felt that the model was not responsive enough included the needs of small schools and districts, and gifted and talented students.

Does the current funding model provide the resources needed for schools or districts to offer the required educational program?

Survey responses were similarly divided on whether or not the current funding model provided the resources needed (about 40 percent of responses in either group). Of respondents that felt there were not adequate resources, a number of respondents indicated that recent funding cuts have limited the ability of the funding model to provide the resources needed to offer the educational program (25 percent of educators and about 15 percent of parents and community members). About 10 percent of educator respondents indicated that the funding model provided the resources needed in larger schools, but not in smaller schools. Other areas where survey respondents indicated that there were not enough resources were: non-core classes, including CTE and technology, supports and services for special needs students, and classroom supplies.

About five percent of parents and community member respondents felt that too many resources were provided (as did two percent of educator respondents), specifically in areas like central office, facilities, and athletics.

Do you see any opportunities for costs savings, such as through shared services?

About forty percent of respondents either: (1) indicated that they did not see any opportunities for cost savings; (2) argued against cuts, consolidation, or more shared services; or (3) stated that they were already sharing services as best they could, so there were no additional opportunities.

Of those that did identify opportunities for cost savings, four changes were recommended by five to 10 percent of respondents:

- Cut administrators/administration
- Increased shared services/courses
- Consolidation
- Cut sports/activities

The largest recommended opportunity for costs savings was to cut administrators/administration. These recommendations centered around reducing the number of administrative positions and cutting administrative salaries. Increased shared services/courses included sharing student support services (such as speech pathologists or special education services), as well as sharing courses, such as high-level mathematics. Recommendations for cost savings through consolidation included recommendations to consolidate schools in the same city, and to consolidate districts in the same region or county. Recommendations to cut sports and activities often mentioned the costs of travel for multiple teams.

Seven additional opportunities for cost savings were identified by at least 10 people: cut facilities costs, cut instructional facilitators, offer online classes or increase automation, cut student travel/transportation, change staff/course offerings, eliminate school of choice/open enrollment, or move to a four-day school week.

Do you have any specific feedback about the current funding model: related to the calculation of the base resources? Related to regional adjustment, external adjustment, or hold harmless? Related to reimbursements? Related to recapture or entitlement?

Specific feedback on funding model components was limited, with less than half of survey respondents answering the question and no more than 50 providing feedback on any given model component. Overall, respondents in this area indicated that the model worked well when fully funded and that resources should not be cut. Several respondents felt that the model was too complex or that certain elements of the base resource model were underfunded, including class sizes, salaries, and technology. About five percent of respondents indicated that the state needs to diversify its revenue base, with several also indicating that education should have a dedicated revenue base.

More specific component feedback (with a limited number of respondents) included:

- The external cost adjustment should be fully funded.
- The regional cost adjustment is inequitable and does not accurately account for factors driving differences in costs across regions.
- Recapture districts is unfair to the counties contributing revenues and that they should be allowed to keep their excess revenues.
- Special education and transportation should continue to be 100 percent reimbursed.

V. Conclusions

Educational Program

The study team presented the following conclusions and recommendations related to the Educational Program to the Select Committee at the October meeting.

Wyoming's Education Program is well aligned in most content areas with regional and high-performing comparison states.

Stakeholders emphasized how critical all components of the basket of goods are to ensuring Wyoming students receive a well-rounded education, and overall, the study team has found Wyoming's Education Program to be well aligned in most areas with the content standards required in both regional and high-performing states. As noted in the Education Program Comparison memo included in the meeting materials, the required Common Core of Knowledge and Common Core of Skills are implemented through the state's content standards in the areas of: ELA, math, science, social studies, fine and performing arts, foreign language, health education, physical education, and CTE training. The study team found that by consolidating these categories (humanities and government condensed into social studies; applied technology embedded in a few different areas), Wyoming is generally aligned with the standards categories required in the comparison states. Variation existed between Wyoming and other states' standards in the areas of CTE and technology (addressed further below). Foreign language standards were also more typically addressed as world language standards in the comparison states. A deeper examination of the assessed areas of ELA, math, and science showed that Wyoming's specific standards within these categories are similar or identical to two-thirds or more of the comparison states.

From a housekeeping perspective, Wyoming could eliminate humanities and civics/government from the basket to better mirror current content standards areas (which in turn is consistent with comparison states). It could also combine the Common Core of Knowledge and Skills into one category, since there is not always a clear distinction between the two (applied technology could be considered a skill and personal finance could be considered an area of knowledge).

The Select Committee should consider more strongly emphasizing career and workforce readiness.

While CTE is already a component of the basket of goods and services, one of the most prominent themes of the stakeholder feedback was that postsecondary readiness was being prioritized at the expense of career and workforce readiness. The state needs to ensure that career and workforce options are treated as equally valid paths for students when they graduate. Stakeholders stressed the importance of preparing students for both "traditional" Wyoming industries, as well as emerging technology industries. Based on our cross-state comparison, Wyoming is ahead of many other states because it has K-12 CTE standards, which few of the comparison states had. Further emphasis in this area could include ensuring there is the flexibility and resources to offer a range of CTE courses (addressed through the funding model), as well as applied courses and hands-on education experiences in other content areas, such as math and science. Ensuring equity of opportunity in the state's smaller districts is also important. Two related points:

The impact of the inclusion of eligibility for the Hathaway Scholarship program in the accountability system should be considered.

Across all forms of stakeholder feedback, respondents mentioned that while the Hathaway Scholarship program was originally intended as just a scholarship program, it has ultimately had a broader impact on student, school, and district choices. Since eligibility for the Hathaway Scholarship is a component of the accountability system, districts face pressure to ensure all students are eligible to pursue a postsecondary course of study. Districts are making staff and course offering decisions to drive resources into the core subject areas and meet the needs of the upper levels of Hathaway that are resulting in fewer elective offerings, including CTE.

The Select Committee should consider how well technology knowledge and skills are being addressed. This could include adding computer science as a basket component.

In addition to promoting career and workforce readiness through existing CTE fields, stakeholders at the state level felt Wyoming students should be prepared for emerging technology careers in order to have a 21st century workforce in the state. Currently, applied technology is a component of the Common Core of Knowledge, but is not a separate content standard area and instead is embedded in other content standard areas. Of the 13 comparison states, ten states had separate technology standards. The Select Committee should consider: (1) how relevant the current applied technology standards are to a 21st century workforce; and (2) if additional related knowledge areas are needed, such as computer science. Currently, Indiana, Massachusetts, and New Jersey have K-12 computer science standards, with Colorado, New Hampshire, and Virginia in the process of developing these standards. As such, all but one of the high-performing states will soon have computer science standards.

However, there are a number of important issues that would need to be addressed to expand the technology standards in Wyoming: (1) it is difficult to add new requirements to the basket while at the same time cutting funding that may lead to reductions in other content areas; (2) it will be difficult for schools and districts to hire the trained staff that would be needed with current certification requirements; and (3) schools and districts, particularly in small settings, are already feeling constrained in what courses they have the resources to offer, so consideration would need to be given to whether this is an additional requirement, or if it could fulfill another existing requirement. For example, in the comparison states, computer science can fulfill a math requirement in New Jersey; a science requirement in Utah; and a math, science, or CTE requirement in Virginia. In 2018, Colorado will also allow courses that include computer science to count as a math or science requirement for graduation.

The Select Committee should consider the relevance and exhaustiveness of the Common Core of Skills, as well as how these skills are integrated into the content standards.

Another key theme from stakeholder feedback was that students needed to better develop "soft skills" in order to be successful in both postsecondary studies and the workforce. However, many of the skills they believe are needed (problem solving, critical thinking, communication, personal finance) are already in the Common Core of Skills and are addressed through the existing content standards. Other skill areas that stakeholders thought should be addressed include: having a strong work ethic, self-direction, and personal accountability. These skills, and others, are noted as a part of 21st century skills in other states. (It is not to say these skills are not already being taught in Wyoming, just that they are not specifically referred to in the basket). The Select Committee should consider if the Common Core of Skills is up to date and inclusive of all the skills they expect Wyoming students to demonstrate, and then how these skills are being integrated into the current content standards.

Funding Model

Comparison of Model Elements

The study team recommends using caution when comparing the recommendations for discrete model elements of comprehensive funding systems. In some cases, a study that may be lower than others in one element may compensate with additional resources in other elements. With this caveat, this analysis finds that:

- Wyoming's current Legislative Model, in general is most comparable to the recommendations of the other evidence-based studies reviewed for this report. This is not surprising since the legislative model has been based on the evidence-based model since the 2005 recalibration.
- The Wyoming model is comparable to all of the other studies for class size, the number of elective teachers, professional development resources, technology, assessments, and central office administration.
- The Wyoming model is higher, on average, in the areas of special education support and gifted and talented funding (per-pupil amounts only).
- The Wyoming model is lower, on average, in the areas of at-risk funding, pupil support, ELL, instructional coaches/instructional facilitators, and instructional materials.

Treatment of Uncontrollable Costs

Wyoming is one of few states that incorporates funding adjustments for certain uncontrollable costs, such as small schools or districts, isolated schools, the cost of inflation, and the transportation or maintenance of isolated students. Wyoming's current funding model includes three of the four adjustments: 1) small schools or districts, 2) the cost of inflation, and 3) the transportation or maintenance of isolated students. The state does not provide additional funding for isolated schools. In all cases the specifics of the cost adjustment policies vary from state to state, reflecting the context and preferences of each state. Seventeen states in addition to Wyoming provide cost adjustments for small schools, small districts or both. Eight states in addition to Wyoming adjust district funding for inflation, and five states plus Wyoming fund transportation or maintenance costs for students residing far enough from the nearest school that it is more economical to reimburse families' costs for transporting or housing their students than to provide traditional student transportation services. Eighteen states provide additional funding for small, isolated schools, defined as "necessarily small" schools that are required to serve students in sparsely populated, geographically dispersed communities.

Recommendations

The study team is not presenting final recommendations related to the Funding Model in this report. Instead, the findings from the review of the Funding Model in this report will be used in conjunction with findings from the equity study, additional studies on special education and transportation, and alternative approaches to adequacy as it makes recommendations in the concluding Recalibration report.

References

Aportela, A., Picus, L. O., Odden, A., & Fermanich, M. (2014). *A Comprehensive Review of State Adequacy Studies Since 2003*. Denver, CO: APA Consulting.

Campbell County School District v. State, 907 P.2d 1238 (Wyo. 1995)

Hewitt, T. (April 28, 2017). *The Campbell Cases: Requirements for the Legislature* (Memorandum to Members, Select Committee on School Finance Recalibration). Cheyenne, WY: Legislative Services Office Legal Services Division, Wyoming State Legislature.

NCES State CWI 1997-2014, http://bush.tamu.edu/research/faculty/Taylor_CWI/

NEA Research. (2017). *Rankings of the States 2016 and Estimates of School Statistics 2017*. Washington, DC: Author

Odden, A. R. & Picus, L. O. (2014). *School Finance: A Policy Perspective*, 5th Edition. New York, NY: McGraw Hill.

Appendix A

Overview of State Standards Areas

Cross-State Overview of Content Standards Areas- Regional States

	English Language Arts	Mathematics	Science	Social Studies	Fine and Performing Arts	Foreign Language	Health Education	Physical Education	Career/Vocation Training	Other Content Areas
Wyoming	Yes	Yes	Yes	Yes	Yes; Fine and Performing Arts includes Dance, Music, Theatre, and Visual Arts.	Yes	Yes	Yes	Yes; Career & Vocational Education includes Creativity & Innovation; Communication & Collaboration; Research & Information Fluency; Critical Thinking, Problem Solving, and Decision Making; Digital Citizenship; and Technology Operations and Concepts. Additional standards exist within CTE career areas.	
Regional States										
Colorado	Yes	Yes; Mathematics is includes the integration of Personal Financial Literacy standards within both the economics and mathematics content areas.	Yes	Yes	Yes; Arts includes Music, Visual Arts, Theatre, and Dance.	Yes	Yes	Yes	Standards exist within CTE career areas.	Computer Science for secondary students; Environmental Education
Montana	Yes	Yes	Yes	Yes	Yes; Arts includes Dance, Media Arts, Music, Theatre, Visual Arts.	Yes	Yes; Traffic Education is categorized with Health and Physical Education under Health Enhancement.	Yes	Standards exist within CTE career areas.	Digital Literacy/Computer Science/Technology/Library Media
Idaho	Yes; ELA/Literacy also includes Handwriting and Speech.	Yes	Yes	Yes	Yes; Arts and Humanities includes dance, interdisciplinary humanities, media arts, music, theater, visual arts, and world languages.	Yes; included in Arts and Humanities Standards.	Yes	Yes	Standards exist within CTE career areas.	Information and Communication Technology; Computer Science;
North Dakota	Yes	Yes	Yes	Yes	Yes; Arts includes Music, Dance, Visual Arts, and Drama.	Yes	Yes	Yes	Standards exist within CTE career areas.	Library and Technology
South Dakota	Yes; Literacy in History/Social Studies, Science and Technical Subjects is included in English Lanuage Arts Standards	Yes	Yes	Yes	Yes; Dance/Movement, Theater/Dramatic Arts; Music and Visual Arts	Yes	Yes	Yes	Standards exist within CTE career areas.	Personal Finance, School Library, Education Technology, and Oceti Sakowin Essential Understanding and Standards.
Nebraska	Yes	Yes	Yes	Yes	Yes; Fine Arts includes Media Arts, Visual Arts, Dance, Music, and Theatre.	Yes	Yes	Yes	Standards exist within CTE career areas.	
Utah	Yes	Yes	Yes	Yes	Yes; Fine Arts includes Dance, Drama, Music, and Visual Arts.	Yes	Yes	Yes	Standards exist within CTE career areas.	Driver Education; Library Media

Cross-State Overview of Content Standards Areas- High Performing States

	English Language Arts	Mathematics	Science	Social Studies	Fine and Performing Arts	Foreign Language	Health Education	Physical Education	Career/Vocation Training	Other Content Areas
Wyoming	Yes	Yes	Yes	Yes	Yes; Fine and Performing Arts includes Dance, Music, Theatre, and Visual Arts.	Yes	Yes	Yes	Yes; Career & Vocational Education includes Creativity & Innovation; Communication & Collaboration; Research & Information Fluency; Critical Thinking, Problem Solving, and Decision Making; Digital Citizenship; and Technology Operations and Concepts. Additional standards exist within CTE career areas.	
High Performing States										
Massachusetts	Yes	Yes	Yes	Yes	Yes; Arts includes Dance, Music, Theatre, and Visual Arts.	Yes	Yes; Physical Health including Physical Activity and Fitness are in Comprehensive Health Standards.	Yes; included in Health Standards.	Standards exist within CTE career areas.	Digital Literacy and Computer Science;
Vermont	Yes	Yes	Yes	Yes	Yes; Core Arts standards include Dance, Music, Theater, Visual Arts and Media Arts.	Yes; included in Global Citizenship Standards	Yes	Yes	Standards exist within CTE career areas.	Driver Education
New Hampshire	Yes	Yes	Yes	Yes	Yes; Arts Education includes Music, Visual Arts, Dance, and Theatre.	Yes	Yes	Yes	Yes; Career Development includes Core Educational Learning, Individual Social Learning, and Career Learning.	Computer Science; Information and Communication Technology Literacy
New Jersey	Yes	Yes	Yes	Yes	Yes; Visual and Performing Arts Standarss include Dance, Music, Theatre, and Visual Arts.	Yes	Yes	Yes	Yes; 21st Century Life and Careers includes 12 Career Ready Practices, Personal Financial Literacy, Career Awareness, Exploration, and Preparation, and Career and Technical Education.	Technology
Virginia	Yes	Yes	Yes	Yes	Yes, Fine Arts includes Dance Arts, Music, Theatre Arts, and Visual Arts.	Yes	Yes	Yes	Standards exist within CTE career areas.	Family Life, Economics & Personal Finance, Computer Technology, Computer Science, and Driver
Indiana	Yes	Yes	Yes	Yes	Yes; Fine Arts includes Dance, Music, Theatre, and Visual Arts.	Yes	Yes	Yes	Standards exist within CTE career areas.	Computer Science, Financial Literacy, Guidance

Appendix B

English Language Arts Standards

English Language Arts Standards K-5: States in the Region

All standards are numbered following the conventions of Wyoming when possible.

COLORADO	
Overall Finding: Colorado's K-5 ELA standards expand on those of Wyoming. Colorado does not include some of the standards seen in the Wyoming ELA standards.	
Differences:	**Examples:**
Colorado includes standards at additional grade levels.	Wyoming standard W.10: *Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences,* is an expectation for Grades 3 and up. In Colorado, this is an expectation for all grade levels starting in Kindergarten.
Colorado includes additional standards (154).[1]	Colorado expands Wyoming standard W.2.2 to include: a. *Write letters and "how-to's" (procedures, directions, recipes) that follow a logical order and appropriate format.* b. *Organize informational texts using main ideas and specific supporting details.* c. *Organize ideas using a variety of pictures, graphic organizers or bulleted lists.* d. *Use relevant details when responding in writing to questions about texts.* e. *State a focus when responding to a given question, and use details from text to support a given focus.* f. *Apply appropriate transition words to writing.* Colorado has additional Language standards at fourth grade: a. *Read and understand words with common prefixes (un-, re-, dis-) and derivational suffixes (-ful, -ly, -ness).* b. *Read and understand words that change spelling to show past tense: write/wrote, catch/caught, teach/taught.* c. *Read multisyllabic words with and without inflectional and derivational suffixes.* d. *Infer meaning of words using explanations offered within a text.*

[1] Many of these are similar to existing standards.

COLORADO	
Colorado includes additional areas targeted by standards.[2]	*Quality of thinking depends on the quality of questions* (Kindergarten). *a. Ask primary questions of clarity, significance, relevance, and accuracy to improve quality of thinking.* *b. State, elaborate, and exemplify the concept of fair-mindedness.* *Identifying implications, concepts, and ideas enriches reasoning skills* (Grade 4). *a. Consider negative as well as positive implications of their own thinking or behavior, or others thinking or behavior.* *b. State, elaborate, and give an example of a concept (for example, state, elaborate, and give an example of friendship or conflict).* *c. Identify the key concepts and ideas they and others use.* *d. Ask primary questions of clarity, significance, relevance, accuracy, depth, and breadth*.
Colorado provides additional guidance.	Colorado standards include inquiry questions, relevance and application, and a section on the nature of reading, writing, and communicating for each set of standards.
Colorado does not include two of the Language standards.	Wyoming standard L.5.5a: *Interpret figurative language, including similes and metaphors, in context.* Wyoming standard L.5.5b: *Recognize and explain the meaning of common idioms, adages, and proverbs*.

[2] In Colorado, there are 4 standards: Oral Expression and Listening, Reading for All Purposes, Writing and Composition, and Research and Reasoning. These are additionally broken down into concepts and skills that students master, which are further broken down into individual standards.

<table>
<tr><th colspan="2">IDAHO</th></tr>
<tr><td colspan="2">Overall Finding: Idaho's K-5 ELA standards mirror those of Wyoming with a few minor differences. Differences include one change in rigor, a number of expanded standards, and the inclusion of handwriting standards.</td></tr>
<tr><td>Differences:
In one case the Idaho standard is less rigorous than that of Wyoming.</td><td>Examples:
Idaho standard RL.2.4 includes that this standard can be met with guidance and support from adults instead of requiring that the student meet the standard without support.</td></tr>
<tr><td>Idaho expanded on Wyoming's standards.</td><td>In Idaho, standard W.1 an additional substandard is included for Grades 4 and 5: Use precise language and domain-specific vocabulary to support opinion piece.
In Idaho, standard W.6 for Grades 3-5 additional information is included:
Demonstrate sufficient command of keyboarding skills to type . . .
a. a minimum of one page in a single setting (Grade 3).
b. multi-paragraph text (e.g., 1-2 pages) (Grade 4).
c. multi-paragraph text (e.g., 1-3 pages) (Grade 5).</td></tr>
<tr><td>Idaho includes additional standards.</td><td>Idaho includes handwriting standards (n = 9) for Grades K-6.</td></tr>
</table>

<table>
<tr><th colspan="2">MONTANA</th></tr>
<tr><td colspan="2">Overall Finding: The only difference between Montana’s and Wyoming’s K-5 ELA standards is the inclusion by Montana of material relevant to American Indians.</td></tr>
<tr><td>Differences:
Montana includes content relevant to American Indians.</td><td>Examples:
Many of the standards for Montana explicitly direct teachers to include content relevant to American Indians.
a. RL.K.4: With prompting and support, ask and answer questions about unknown words in a text. <u>Recognize words and phrases with cultural significance to American Indians.</u>
b. RL.5.9: Compare and contrast stories in the same genre (e.g., mysteries and adventure stories <u>including traditional and contemporary stories by and about American Indians</u>) on their approaches to similar themes and topics.
c. RI.3.3: Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. <u>Include texts by and about American Indians.</u></td></tr>
</table>

<table>
<tr><th colspan="3">NEBRASKA</th></tr>
<tr><td>Overall Finding:</td><td colspan="2">Nebraska's K-5 ELA standards are not based on the Common Core and differ in many ways from those of Wyoming. Many of the same topic areas are covered but Nebraska also covers digital citizenship, explicit strategy usage, and information fluency. In some cases, Nebraska's standards are more explicit and expansive. However, many of the skills delineated in their standards are necessary to meet the Wyoming standards. The language standards are much less explicit than those of Wyoming. A few differences in rigor were observed in both directions, however due to the lack of one-to-one correspondence in standards, rigor judgements were only made when the difference in rigor was clear and convincing.</td></tr>
<tr><td>Differences:</td><td colspan="2">Examples:</td></tr>
<tr><td></td><td>Wyoming</td><td>Nebraska</td></tr>
<tr><td>Some of Nebraska's standards are more specific than those of Wyoming.</td><td>SL.4.1:
b. Follow agreed-upon rules for discussions and carry out assigned roles.
c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.</td><td>LA 4.3.2.a: Demonstrate active and attentive listening skills (e.g., eye contact, nonverbal cues, recalling, questioning) for multiple situations and modalities.
LA 4.3.3.a: Demonstrate appropriate social etiquette and apply social cues when communicating.
LA 4.3.3.b: Demonstrate awareness of and sensitivity to the appropriate use of words (e.g., stereotypes, multiple meanings of words) in conversation.
LA 4.3.3.c: Apply conversation strategies to recognize and consider new information presented by others in relationship to one's own ideas.
LA 4.3.3.d: Listen, ask clarifying questions, summarize, and explain information being communicated and consider its contribution to a topic, text, or issue under study.</td></tr>
<tr><td>Some of Nebraska's standards are more rigorous than those of Wyoming.</td><td>RL.K.1: With prompting and support, ask and answer questions about key details in a text.</td><td>LA.0.1.6i: Construct and/or answer clarifying questions (who, what, when, where, why, how) and support answers with evidence from the text or additional sources.</td></tr>
<tr><td></td><td>W.3.5: With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.</td><td>LA 3.2.1.e: Revise to improve and clarify writing through self-monitoring strategies and feedback from others.
LA 3.2.1.f: Provide oral and/or written descriptive feedback to other writers.
LA 3.2.1.h: Proofread and edit writing recursively for format and conventions of standard English (e.g., spelling, capitalization, grammar, punctuation, syntax, semantics).</td></tr>
</table>

NEBRASKA		
Some of Nebraska's standards are less rigorous than those of Wyoming.	RL.5.2: *Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.*	1.6b: *Analyze and describe elements of literary text (e.g., characters, setting, plot, point of view, theme).* 1.6d: *Summarize and analyze a literary text and/or media, using key details to explain the theme.*
	RI.3.3: *Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.*	RI.3.3: *Build background knowledge and activate prior knowledge to identify text-to-self, text-to-text, and text-to-world connections before, during, and after reading.*
Some standards are moved between grade levels.	The material covered in K.RL.6 is moved to first grade in Nebraska. Nebraska has students start working with literary devices in first grade, while Wyoming does not address these until second grade. LA 1.1.6.c: *Identify an author's use of literary devices (e.g., simile, alliteration, onomatopoeia, imagery, rhythm, personification).*	
Nebraska includes additional standards.	LA 0.1.1.e: *Explain that the purpose of print is to carry information (e.g., environmental print, nametags, street signs).* LA 0.1.2.b: *Segment spoken sentences into words.* LA 1.1.6.a: *Identify author's purpose (e.g., explain, entertain, inform).* LA 0.1.6.h: *Make connections between own life and/or other cultures in literary and informational text.* LA 2.1.6.m: *Self-monitor comprehension by recognizing when meaning is disrupted and apply strategies to clarify, confirm, or correct.* LA 0.1.6.p: *Make connections between a print text and an audio, video, or live version of the text* LA 2.1.6.n: *Make predictions and inferences about a text before, during, and after reading literary, informational, digital text, and/or media.* LA 0.2.1.a: *Use prewriting activities and inquiry tools to generate ideas.* LA 5.4.2.a: *Practice safe and ethical behaviors when communicating and interacting with others digitally (e.g., safe information to share, appropriate language use, utilize appropriate sites and materials, respect diverse perspectives).* LA 5.4.2.b: *Use appropriate digital tools (e.g., social media, online collaborative tools, apps) to communicate with others for conveying information, gathering opinions, and solving problems.* LA 5.4.1.b: *Demonstrate ethical use of information and copyright guidelines by appropriately quoting or paraphrasing from a text and citing the source using available resources (e.g., online citation tools).*	

NEBRASKA	
Some of Wyoming's standards are not explicitly included in Nebraska's standards but are implicit in other standards or standard sets.	RL.K.5: *Recognize common types of texts (e.g., storybooks, poems).* RL.1.7: *Use illustrations and details in a story to describe its characters, setting, or events.* RL.4.10:[3] *By the end of the year, read and comprehend literature, including stories, dramas, and poetry, in the Grades 4-5 text complexity band proficiently, with scaffolding as needed at the high end of the range.* SL.3-5.1a: *a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.* Other standards include: RI.1.6, RI.4.8, RI.5.8.
Nebraska does not include some of Wyoming's standards.	RL.1.6: *Identify who is telling the story at various points in a text.* RL.2.6: *Acknowledge differences in the points of view of characters, including by speaking in a different voice for each character when reading dialogue aloud.* RI.2.8:[4] *Describe how reasons support specific points the author makes in a text.*

[3] All grade levels.
[4] This standard is also not covered for Grades K and 1.

NORTH DAKOTA		
Overall Finding:	North Dakota's K-5 ELA standards differ in many ways from those of Wyoming. North Dakota added two standards, but is missing the 10th writing standard at all grade levels. In addition, North Dakota removed references to the amount of writing to be completed in a single sitting and to keyboarding skills. Numerous standards have been expanded and some have been reorganized. For example, the L1 and L2 standards have been changed to reflect when language skills should be introduced, practiced, and mastered. Some changes in rigor were observed in both directions. On the whole, these standards are very similar to those of Wyoming.	
Differences:	**Examples:**	
	Wyoming	North Dakota
Some of North Dakota's standards expand on those of Wyoming.	RL/RI.K.1: *With prompting and support, ask and answer questions about key details in a text.*	*With prompting and support, ask and answer questions about key/supporting[5] details in a text before, during, and after reading.*
	RL.K.5: *Recognize common types of texts (e.g., storybooks, poems).*	*Recognize common types of texts using their unique features throughout the selection (e.g., storybooks, poems, fairy tales, and nursery rhymes).*
	SL.1.2: *Ask and answer questions about key details in a text read aloud or information presented orally or through other media.*	*Ask and answer questions about key/supporting details in a text read aloud or information presented orally or through other media and requesting clarification if something is not understood.*
In some cases, North Dakota's standards are less rigorous than those of Wyoming.	RL.3.3: *Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events.*	*Describe characters in a story (e.g., their traits, motivations, or feelings) and their actions.*
	RI.K.6: *Name the author and illustrator of a text and define the role of each in presenting the ideas or information in a text.*	*With prompting and support, name or locate the author and illustrator of a text and define the role of each in presenting the ideas or information in a text.*
The scope of North Dakota's standards is at times different.	RI.2.2: *Identify the main topic of a multi-paragraph text as well as the focus of specific paragraphs within the text.*	*Identify the main topic of a multi-paragraph text and retell key/supporting details that support the main topic.*
	RI.3.6: *Distinguish their own point of view from that of the author of a text.*	*Identify first and third person points of view.*

[5] Across standards in North Dakota "key details" was replaced by "key/supporting details" and in RL.K-2.1 the text, "before, during, and after reading" was added.

NORTH DAKOTA		
In some cases, North Dakota's standards are more rigorous than those of Wyoming.	RL.2.10: *By the end of the year, read and comprehend literature, including stories and poetry, in the Grades 2-3 text complexity band proficiently, with scaffolding as needed at the high end of the range.*	*By the end of the year, read and comprehend literature, including stories and poetry, on grade level 1 proficiently and independently.* [6]
	RI.1.10: *With prompting and support, read informational texts appropriately complex for Grade 1.*	*Proficiently read informational texts on grade level.*
	RF.K.4: *Read emergent-reader texts with purpose and understanding.*	*Read with sufficient accuracy and fluency to support comprehension.* *a. Read grade level text with purpose and understanding.* *b. Read grade level text orally with accuracy, appropriate rate, and expression on successive readings.* *c. Use context to confirm or self-correct word recognition and understanding, rereading as necessary.*
	W.K.1-3: *The North Dakota standards for kindergarten writing removes the option of dictating the writing.* For W.3.4, W.3-5.5, and W3-5.6: *North Dakota removes the option to meet this standard "With guidance and support from adults," or from "peers and adults".*	
North Dakota includes some additional standards.	RF.K.1e: *Decode and use CVC words.* RF.1.1h: *Demonstrate use of beginning and ending blends.*	
North Dakota's Language standards are structured differently than Wyoming's.	North Dakota structured its L.1 and L.2 standards to clearly indicate when skills should be introduced and practiced, and when students should display proficiency in each skill. With this change in structure many of the language standards appear in earlier grade levels under the introduce or practice category.	
North Dakota does not include some of Wyoming's standards.	North Dakota does not include the W.10 standard at any grade level.	

[6] North Dakota does not include scaffolding in the RL/RI 10 standards.

SOUTH DAKOTA	
Overall Finding:	Identical standards.

UTAH	
Overall Finding: Utah's K-5 ELA standards generally mirror those of Wyoming with the addition of standards related to cursive and handwriting and one expanded language standard.	
Differences: Utah includes cursive.	**Examples:** Cursive is included in Utah standards: RL/RI 10: a. *Recognize and begin to read documents written in cursive* (Grade 3). b. *Continue to develop fluency when reading documents written in cursive* (Grades 4 and 5). L. 1: a. *Understand that cursive is different from manuscript* (Grade 2). b. *Independently and legibly write all upper- and lower-case cursive letters* (Grade 3). c. *Produce grade-appropriate text using legible cursive writing* (Grades 3 and 4). d. *Fluently, independently, and legibly write all upper and lower case cursive letters* (Grade 4). e. *Maintain legible and fluent cursive writing* (Grade 5).
Utah expanded Language standard 1.	Inclusion of "with guidance and support" to L.K.1a in Utah.
Utah includes additional sub-standards in Language standard 1.	Utah includes additional sub-standards in L.1 for Grades 1 and 2: a. *Independently identify and legibly write all upper- and lowercase letters (legibility is defined as the letter being recognizable to readers in isolation from other letters in a word).* b. *Produce grade-appropriate text using legible writing.*

ENGLISH LANGUAGE ARTS STANDARDS 6-12: STATES IN THE REGION

All standards are numbered following the conventions of Wyoming when possible.

COLORADO	
Overall Finding: Colorado's 6-12 ELA standards expand on those of Wyoming and Colorado breaks the Grades 9/10 and 11/12 standards into individual grade levels.	
Differences:	**Examples:**
Colorado includes additional standards (211).[7]	Colorado has additional Writing standards at Grade 10. a. *Formulate research questions that are clear and precise.* b. *Identify and evaluate potential sources of information for accuracy, reliability, validity, and timeliness.* c. *Distinguish between types of evidence (e.g., expert testimony, analogies, anecdotes, statistics) and use a variety of types to support a particular research purpose.* d. *Use in-text parenthetical citations to document sources of quotations, paraphrases and information.*
Colorado includes additional areas targeted by standards.[8]	*Monitoring the thinking of self and others in a disciplined way to maintain awareness* (Grade 6). a. *Determine strengths and weaknesses of their thinking and thinking of others by using criteria including relevance, clarity, accuracy, fairness, significance, depth, breadth, logic, and precision.* b. *Take control over their thinking to determine when thinking should be questioned and when it should be accepted (intellectual autonomy).* *Complex situations require critical thinking across multiple disciplines* (Grade 11). a. *Analyze the logic of complex situations by questioning the purpose, question at issue, information, points of view, implications and consequences inferences, assumptions and concepts.* b. *Evaluate strengths and weaknesses of their logic and logic of others by using criteria including relevance, clarity, accuracy, fairness, significance, depth, breadth, logic and precision.* c. *Determine the extent to which they entered empathetically into competing points of view, exercised confidence in reason, recognized the limits of their knowledge on the topic (intellectual humility), explored alternative approaches to solving or addressing complex problems (intellectual flexibility), and were open to constructive critique (intellectual open-mindedness).* d. *Analyze and assess the logic of the interdisciplinary domains inherent in reasoning through complex situations.* e. *Monitor and assess the extent to which their own beliefs and biases influenced their reactions to the viewpoints and logic of others.*
Colorado provides additional guidance.	Colorado standards include inquiry questions, relevance and application, and a section on the nature

[7] Many of these are similar to existing standards.

[8] In Colorado, there are 4 standards: Oral Expression and Listening, Reading for All Purposes, Writing and Composition, and Research and Reasoning. These are additionally broken down into concepts and skills that students master, which are further broken down into individual standards.

COLORADO	
	of reading, writing, and communicating for each set of standards.
Colorado has differentiation at higher grade levels.	Reading standards for Literature are broken out into specific grade levels. Grade 9: Standards 2-3, Standards 5-6, and Standards 9-10. Grade 10 Standard 1, Standard 4, Standard 7, Standard 10. Grade 11 Standards 1-4 and Standards 6-10. Grade 12 Standard 5 and Standard 10.

IDAHO	
Overall Finding: Idaho's 6-12 ELA standards are almost identical to those of Wyoming. Idaho includes an additional Writing substandard.	
Differences: Idaho includes an additional Writing substandard.	**Examples:** In standard W.1 an additional substandard is included for Grades 6-10: *a. Use precise language and domain-specific vocabulary to support the argument* (Grades 6-8). *b. Use precise language and domain-specific vocabulary to manage the complexity of the argument* (Grades 9-10). *c. Use precise language, domain-specific, and techniques such as metaphor, simile, and analogy to manage the complexity of the argument* (Grades 11-12).

<table>
<tr><th colspan="2">MONTANA</th></tr>
<tr><td colspan="2">Overall Finding: Montana’s 6-12 ELA standards are almost identical to those of Wyoming. Montana includes additional content relevant to American Indians, along with one additional Language standard.</td></tr>
<tr><td>Differences:
Montana includes content relevant to American Indians.</td><td>Examples:
Many of the standards for Montana explicitly direct teachers to include content relevant to American Indians.
a. RL.6.9: Compare and contrast texts in different forms or genres (e.g., stories and poems; historical novels and fantasy stories; <u>traditional and contemporary stories by and about American Indians</u>) in terms of their approaches to similar themes and topics.
b. W.7.7: Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation. <u>Include sources and/or topics by and about American Indians.</u>
c. RI.11-12.8: Delineate and evaluate the reasoning in seminal U.S. texts <u>including those that dealt with American Indians</u>, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses, <u>American Indian policies</u>)</td></tr>
<tr><td>Montana includes an additional Language standard.</td><td>L.5 Grades 6-8.
Recognize the influence time, culture, gender, and social relationships have on word meaning.</td></tr>
</table>

NEBRASKA		
Overall Finding: Nebraska's ELA 6-12 ELA standards are not based on the Common Core and differ in many ways from those of Wyoming. Many of the same topic areas are covered but Nebraska also covers digital citizenship, explicit strategy usage, and information fluency. In some cases, Nebraska's standards are more explicit and expansive. However, many of the skills delineated in its standards are necessary to meet the Wyoming standards. Other standards including the language standards are much less explicit than those of Wyoming. A few differences in rigor were observed in both directions, however due to the lack of one-to-one correspondence in standards, rigor judgements were only made when the difference in rigor was clear and convincing.		
Differences:	**Examples:**	
	Wyoming	Nebraska
Some of Nebraska's standards are more specific than those of Wyoming.	W.7.7: *Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.*	LA 7.2.1.c: *Gather and use relevant information and evidence from multiple authoritative print and/or digital sources including primary and secondary sources to support claims or theses.* LA 7.2.2.b: *Provide evidence from literary or informational text to support analysis, reflection, and research.* LA 7.2.2.c: *Conduct and publish both short and sustained research projects to answer questions or solve problems using multiple primary and/or secondary sources to support theses.*
	RL.8.1: *Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.*	RL.8.1: *Make and confirm/modify inferences with text evidence while previewing and reading literary, informational, digital text, and/or media.*
Some of Nebraska's standards are more rigorous than those of Wyoming.	RL.8.10: *By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of Grades 6-8 text complexity band independently and proficiently.*	RL.8.10: *Self-monitor comprehension and independently apply appropriate strategies to understand text.*
	W.9-10.5: *Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (Editing for conventions should demonstrate command of Language standards 1-3 up to and including Grades 9-10 on page 54.)*	LA 10.2.1.e: *Revise to improve and clarify writing through self-monitoring strategies and feedback from others.* LA 10.2.1.f: *Provide oral, written, and/or digital descriptive feedback to other writers.* LA 10.2.1.h: *Proofread and edit writing recursively for format and conventions of standard English (e.g., spelling, capitalization, grammar, punctuation, syntax, semantics).*

NEBRASKA		
Some of Nebraska's standards are less specific than those of Wyoming.	W.11-12.3: *Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.* a. *Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.* b. *Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.* c. *Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (e.g., a sense of mystery, suspense, growth, or resolution).* d. *Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.* e. *Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.*	LA 12.2.2.a: *Communicate information and ideas effectively in analytic, argumentative, descriptive, informative, narrative, poetic, persuasive, and reflective modes to multiple audiences using a variety of media and formats.* LA 12.2.1.b: *Generate a draft that interprets complex ideas, raises relevant questions, solves problems, or evaluates ideas through synthesis, analysis, reflection, and use of effective organizational patterns that are appropriate to the purpose and intended audience.*
Some of Nebraska's standards are less rigorous than those of Wyoming.	RI.8.4: *Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.*	LA 8.1.5.b: *Select and apply knowledge of context clues (e.g., word, phrase, sentence, and paragraph clues) and text features to determine meaning of unknown words.* LA 8.1.5.d: *Analyze and use semantic relationships (e.g., multiple meanings, synonyms, antonyms, figurative language, connotations, subtle distinctions) to determine the meaning of words, aid in comprehension, and improve writing.*
	RL.7.6: *Analyze how an author develops and contrasts the points of view of different characters or narrators in a text.*	LA.7.1.6.b: *Analyze and explain the relationships between elements of literary text (e.g., character development, setting, plot, conflict, point of view, theme).*

<table>
<tr><th colspan="3">NEBRASKA</th></tr>
<tr><td>The Wyoming Language standards are abbreviated in the Nebraska standards.</td><td>For example, the L1 and L2[9] standards are replaced by the following at Grade 6.
L.6.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
a. Ensure that pronouns are in the proper case (subjective, objective, possessive).
b. Use intensive pronouns (e.g., myself, ourselves).
c. Recognize and correct inappropriate shifts in pronoun number and person.
d. Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents).
e. Recognize variations from standard English in their own and others' writing and speaking, and identify and use strategies to improve expression in conventional language.
L.6.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
a. Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/ parenthetical elements.</td><td>For example, the L1 and L2 standards are replaced by the following at grade 6.
LA 6.2.1.d: Compose paragraphs with grammatically correct simple, compound, and complex sentences of varying length and complexity.
LA 6.2.1.h: Proofread and edit writing recursively for format and conventions of standard English (e.g., spelling, capitalization, grammar, punctuation, syntax, semantics).</td></tr>
<tr><td>Nebraska includes additional standards.</td><td colspan="2">LA 7.2.2.e: Analyze various mentor texts and/or exemplars in order to create a similar piece.
LA 10.3.2.c: Complete a task following complex multi-step directions.
LA 12.4.2.a: Practice safe and ethical behaviors when communicating and interacting with others digitally (e.g., safe information to share, appropriate language use, utilize appropriate sites and materials, respect diverse perspectives).
LA 12.4.2.b: Use appropriate digital tools (e.g., social media, online collaborative tools, apps) to communicate with others for conveying information, gathering opinions, and solving problems.</td></tr>
</table>

[9] With exception of spelling which is covered.

NEBRASKA	
Some of Wyoming's standards are not explicitly included in Nebraska's standards but are implicit in other standards or standards subsets.	RL.6.5: *Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.* RL.9-10.9: *Analyze how an author draws on and transforms source material in a specific work (e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare).* RI.6.8: *Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.* RI.9-10.9: *Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts.* RI.11-12.9: *Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.* W.6-12.3b: *Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.*

<table>
<tr><th colspan="3">NORTH DAKOTA</th></tr>
<tr><td colspan="3">Overall Finding: North Dakota's K-5 ELA standards differ in many ways from those of Wyoming. North Dakota added an additional writing standard, but is missing the 10th writing standard at all grade levels. In addition, North Dakota removed references to the amount of writing to be completed in a single sitting and to keyboarding skills. Numerous standards have been expanded and some have been reorganized. For example, the L1 and L2 standards have been changed to reflect when language skills should be introduced, practiced, and mastered. Additionally, some standards vary in specificity and scope. Some changes in rigor were observed in both directions. On the whole, these standards are very similar to those of Wyoming.</td></tr>
<tr><td>Differences:</td><td colspan="2">Examples:</td></tr>
<tr><td>North Dakota's 6-8 Writing standards are more specific than those of Wyoming.</td><td>Wyoming
W.6.1: Write arguments to support claims with clear reasons and relevant evidence.
a. Introduce claim(s) and organize the reasons and evidence clearly.
b. Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.
c. Use words, phrases, and clauses to clarify the relationships among claim(s) and reasons.
d. Establish and maintain a formal style.
e. Provide a concluding statement or section that follows from the argument presented.

W.8.2: Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.</td><td>North Dakota
Write arguments to support claim(s) (thesis statement) with clear reasons and relevant evidence. [10]
a. Introduce claim(s) and organize the reasons and evidence clearly.
b. Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.
c. Use words, phrases, and clauses as transitions to clarify the relationships among claim(s) and reasons.
d. Establish and maintain a formal writing style.
e. Provide a concluding statement or section that follows from the argument presented.

Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. [11]
a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aid comprehension.
b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.</td></tr>
</table>

[10] The same changes are seen in Grades 7 and 8 along with the addition of language "counterclaims".
[11] The same changes are seen in Grades 6 and 7.

NORTH DAKOTA		
	c. *Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.* d. *Use precise language and domain-specific vocabulary to inform about or explain the topic.* e. *Establish and maintain a formal style.* f. *Provide a concluding statement or section that follows from and supports the information or explanation presented.*	c. *Use appropriate and varied <u>words, phrases, and clauses as</u> transitions to create cohesion and clarify the relationships among ideas and concepts.* d. *Use precise language and domain-specific vocabulary to inform about or explain the topic.* e. *Establish and maintain a formal <u>writing</u> style.* f. *Provide a concluding statement or section that follows from and supports the information or explanation presented.*
Some of North Dakota's standards are less specific than those of Wyoming.	RL.7.7: *Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version, <u>analyzing the effects of techniques unique to each medium (e.g., lighting, sound, color, or camera focus and angles in a film).</u>*	*Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version.*
	RI.11-12.9: *Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.*	*Analyze how texts within and/or across time periods treat similar topics, addressing their themes, purposes, and rhetorical strategies.*

NORTH DAKOTA		
	W.9-10.3: *Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.* *a. Engage and orient the reader by setting out a problem, situation, or observation, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; ~~create a smooth progression of experiences or events.~~* *c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole.*	*Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.* *a. Engage and orient the reader by setting out a problem, situation, or observation, establishing one or multiple point(s) of view, and introducing a narrator and/or characters.* *c. Use a variety of techniques to sequence events in a smooth progression so that they build on one another to create a coherent whole.*[12]
North Dakota's standards are at times more rigorous than those of Wyoming.	In the Reading standards for Literature and Informational Text standards RL/RI.2 and RL/RI.3 the requirement was added from Grades 9-12 to "*Cite strong and thorough textual evidence*". W.6-12.5: *Removal of language that this standard can be met, "with some guidance and support from peers and adults."* SL.6-8.3: *Addition of the requirement to Evaluate the speaker's argument, instead of Delineate the speaker's argument.*	
	RI.11-12.3: *Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.*	*Analyze how and why multiple characters and textual elements develop and interact over the course of a text:* *a. Analyze how multiple complex characters and literary elements (e.g., symbolism, mood, setting, etc.) develop over the course of a text, interact with other elements, and advance the plot or develop the theme.* *b. Cite strong and thorough textual evidence.*
North Dakota's standards are at times less rigorous than those of Wyoming.	In the RL/RI 10 standard for Grades 6-12, the standard indicates that students are to read grade level appropriate texts proficiently and independently *with scaffolding as needed*.	

[12] This sub-standard is listed as sub-standard b (flipped with c) in the North Dakota ELA standards. All other sub-standards are the same.

NORTH DAKOTA		
The scope of some of North Dakota's standards differs from that of Wyoming.	R.9-10.6: *Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States, drawing on a wide reading of world literature.*	*Analyze how cultural experiences influence particular points of view in diverse works of literature.*
	RI.9-10.9: *Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts.*	*Analyze how authors draw on other texts in a specific work (e.g., through allusion, direct reference), including how they address related themes and/or concepts.*
The scope and sequence of some standards differs between North Dakota and Wyoming.	RI.9-10.4: *Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).*	*Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone (e.g., analyzing how the language of a court opinion differs from that of a newspaper; identifying cultural and gender perspectives or bias in language).*
	RI.11-12.4: *Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).*	*Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone, including words with multiple meanings or language that creates particular effects.*
	RI.11-12.6: *Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.*	*Determine an author's point of view or purpose and possible biases in a text, and analyze how the author's choices about style, content, and presentation are particularly effective or ineffective in achieving the author's purposes.*

NORTH DAKOTA		
North Dakota expanded on some of Wyoming's standards.	W.9-12.1d: *Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.* W.9-12.4: *Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)* L.7.3: *Use knowledge of language and its conventions when writing, speaking, reading, or listening.* *a. Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.*	*Establish and maintain an appropriate style and tone suitable for the norms and conventions of the discipline in which they are writing.* *Produce clear and coherent writing in which the development, organization, style, and format (e.g., MLA, APA) are appropriate to a range of tasks, purposes, and audiences. (Grade specific expectations for writing types are defined in standards 1-3.)* *Use knowledge of language and its conventions when writing, speaking, reading, or listening.* *a. With varied sentence patterns, choose language that expresses ideas concisely; recognize and eliminate redundancy.*
North Dakota has moved some information between standards.	The standards targeting text summarization have been moved from standard RL/RI.2 to standard RL/RI.1 for Grades 6-12.	
North Dakota's Language standards are structured differently than Wyoming's.	North Dakota has structured its L.1 and L.2 standards to clearly indicate when skills should be introduced and practiced, and when students should display proficiency in each skill. With this change in structure many of the language standards appear in earlier grade levels under the introduce or practice category.	
North Dakota includes an additional writing standard.	W.11-12.1-3: *Incorporate elements of narrative and informative/explanatory writing into arguments when appropriate for purpose, audience, and context.*	
North Dakota does not include some of Wyoming's standards.	North Dakota does not include the W.10 standard at any grade level. L.6-12.4d: *Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).* L.6-8.5b: *Use the relationship between particular words to better understand each of the words.*	

SOUTH DAKOTA	
Overall Finding:	Identical standards.

UTAH	
Overall Finding:	Identical standards.

ENGLISH LANGUAGE ARTS STANDARDS K-5: SELECTED STATES IN THE REGION BASED ON HIGH ACADEMIC PERFORMANCE

All standards are numbered following the conventions of Wyoming when possible.

<table>
<tr><th colspan="3">INDIANA</th></tr>
<tr><td colspan="3">Overall Finding: Indiana’s Standards are similar to those of Wyoming. Indiana includes additional standards targeting media literacy, handwriting in Grades K-3, and nonfiction text structures. Indiana moved some standards such as those pertaining to Conventions of Standard English from Language Standards to Writing Standards. Other changes include changes in rigor, expansion, specificity, and scope.</td></tr>
<tr><td>Differences:</td><td colspan="2">Examples:</td></tr>
<tr><td>In some cases, Indiana lists a concept at an initial grade level and then notes at subsequent grade levels that, “Students are expected to build upon and continue applying concepts learned previously.”</td><td colspan="2">K.RF.2.1: Demonstrate understanding that print moves from left to right across the page and from top to bottom.

1.RF.2.1-5.RF.2.1: Students are expected to build upon and continue applying concepts learned previously.</td></tr>
<tr><td>Indiana includes standards targeting media literacy.</td><td colspan="2">2.ML.2.1: Recognize that media can be sources for information, entertainment, persuasion, interpretation of events, and transmission of culture.

5.ML.2.1: Review claims made in various types of media and evaluate evidence used to support these claims.</td></tr>
<tr><td rowspan="4">Some of Indiana’s standards are less rigorous than those of Wyoming.</td><td>Wyoming</td><td>Indiana</td></tr>
<tr><td>RF.K.2.a: <u>Count</u>, pronounce, blend, and segment syllables in spoken words.</td><td>K.RF.3.2: Orally pronounce, blend, and segment words into syllables.</td></tr>
<tr><td>RL.3.2: Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through details in the text.</td><td>3.RL.2.2: Retell folktales, fables, and tall stories from diverse cultures; identify the themes in these works.</td></tr>
<tr><td>W.K.3: Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.</td><td>K.W.3.3: Use words and procures to narrate a single even or simple story, arranging ideas in order.</td></tr>
</table>

INDIANA		
Some of Indiana's standards are more rigorous than those of Wyoming.	RF.K.4: *Read emergent-reader texts with purpose and understanding.*	K.RL.1: *Reader emergent-reader texts, maintain an appropriate pace and using self-correcting strategies while reading.*
	RF.1.3.a: *Know the spelling-sound correspondence for common consonant diagraphs.*	1.RF.4.1: *Use letter-sound knowledge of single consonants (hard and soft sounds), short and long vowels, consonant blends and diagraphs, vowel teams (e.g. ai) and diagraphs, and r-controlled vowels to decode phonetically regular word independent of context.*
	RL.4.2: *Determine the theme of a story, drama, or poem from details in the text; summarize the text.*	4.RL.2.2: *Paraphrase or retell the main events in a story, myth, legend, or novel; identify the them and provide evidence for interpretation.*
Some of Indiana's standards are more expansive than those of Wyoming.	RF.1.3.f: *Read words with inflectional endings.*	1.RF.4.6: *Read grade-appropriate root words and affixes including plurals, verb tense, comparatives (e.g., look, -ed, -ing, -s, -er, -est), and simple compound words.*
	RI.5.9: *Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.*	5.RN.4.2: *Combine information from several texts or digital sources on the same topic in order to demonstrate knowledge about the subject.*
Some of Indiana's standards are more specific than those of Wyoming.	RL.2.2: *Recount stories, including fables and folktales, from diverse cultures, and determine their central message, lesson, or moral.*	2.RL.2.2: *Recount the beginning, middle, and end of stories, including fables and folktales, from diverse cultures, and determine their central message, lesson, or moral.*
Some of Indiana's standards are less specific than those of Wyoming.	RL.5.7: *Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation or fiction, folktale, myth, or poem).*	5.RL.4.1: *Analyze how visual and multimedia presentations and representations can enhance the meaning of a text.*
In a few cases, the scope of Indiana's standards differs from that of Wyoming.	RL.2.3: *Describe how characters in a story respond to major events and challenges.*	2.RL.2.3: *Describe how characters in a story respond to major events and how characters affect the plot.*

INDIANA	
Indiana includes some additional standards.	1.RF.2.4: *Learn and apply knowledge of alphabetical order*. I.RF.3.3: *Add, delete, or substitute sounds to change single-syllable words.* K.RF.4.2: *Blend consonant-vowel-consonant (CVC) sounds to make words.* 1.RF.4.5: *Read words in common word families (e,g, - at, -ate)* K.RL.2.4: *Make predictions about what will happen in a story.* [same with first and second grade] Indiana added standards at Grades K-3 in nonfiction features and structures that pertain to how nonfiction text can be structured to describe a topic, indicate order, compare and contrast to describe a procedure, and indicate a problem or solution or put events in chronological order. Indiana added standards at Grades K-3 under Speaking and Listening about giving and following directions, and with the expectation that they be followed in Grades 4-5. Indiana added Handwriting standards (W.2) under Writing for Grades K-3.
Indiana does not include some of Wyoming's standards.	RF.1.3.d: *Use knowledge that every syllable must have a vowel sound to determine the number of syllables in a printed word.* RL.K.4: *Ask and answer questions about unknown words in a text.* RL.1.4: *Identify words and phrases in stories or poems that suggest feelings or appeal to the senses.* RL.3.4: *Determine the meaning of words and phrases as they are used in a text, distinguishing literal from nonliteral language.* (similar additions in grades 4 and 5) RI.K.5: *Identify the front cover, back cover, and title page of a book.* RI.4.5: *Determine the meaning of general academic and domain-specific words or phrases in a text.* Indiana does not include some of Wyoming's Language substandards pertaining to Conventions of Standard English (which it moved to Writing standards) such as using frequently occurring prepositions (L.K.1.E) and using frequently occurring adjectives (L.1.1.f).

MASSACHUSETTS	
Overall Finding: Massachusetts' K-5 ELA standards vary from those adopted by Wyoming in a number of key ways. Massachusetts includes additional standards including Pre-Kindergarten standards, the 4th and 10th writing standards at additional grade levels, and additional language sub-standards. Massachusetts is also missing three of the language sub-standards included by Wyoming. Other changes to the Massachusetts standards include the reorganization of some standards, the expansion of some standards, and in some cases a decrease in specificity in standards. Several standards were changed to be either more or less rigorous. Massachusetts also provides additional guidance by including additional examples, making explicit links between ELA standard sets, and by linking relevant ELA standards to mathematics standards.	
Differences:	**Examples:**
Massachusetts includes additional standards for PreK students.	RL.PK.1: *With guidance and support, demonstrate understanding of the organization and basic features of printed and written text: books, words, letters, and the alphabet.* *a. Handle books respectfully and appropriately, holding them right-side-up and turning pages one at a time from front to back.* *b. (Begins in kindergarten or when the individual child is ready.)* *c. (Begins in kindergarten or when the individual child is ready.)* *d. Recognize and name some uppercase letters of the alphabet and the lowercase letters in their own name.* L.PK.4: *Ask and answer questions about the meanings of new words and phrases introduced through books, activities, and play.* *a. With guidance and support, generate words that are similar in meaning (e.g., happy/glad, angry/mad).*
Massachusetts includes additional writing standards.	W.K.10: *Write or dictate writing routinely for a range of tasks, purposes, and audiences.* W.1-2.10: *Write routinely for a range of tasks, purposes, and audiences.* W.1-2.4: *Produce writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)*
Massachusetts includes additional sub-standards for Language and Writing standards.	L.K.2b: *Form questions that seek additional information, rather than a simple yes/no answer.* L.2.4f: *Recognize and use appropriately abbreviations related to grade-level content or commonly used in everyday life (e.g., a.m., p.m.).* L.3.2a: *Write legibly and fluently by hand, using either printing or cursive handwriting.* L.3.2g: *Demonstrate understanding that numerals used at the beginning of a sentence are written as words and capitalized (e.g., "Three pandas could be seen eating leaves high in the bamboo grove.").* W.5.3f: *For prose narratives, draw on characteristics of traditional or modern genres (e.g., tall tales, myths, mysteries, fantasies, historical fiction) from diverse cultures as models for writing. (See Grade 5 Reading Literature Standard 9.)*
Massachusetts does not include some of the	L.3.1a: *Explain the function of nouns, pronouns, verbs, adjectives, and adverbs in general and their*

MASSACHUSETTS		
Wyoming's Language standards.	*functions in particular sentences* L.5.1a: *Explain the function of conjunctions, prepositions, and interjections in general and their function in particular sentences.*	
Massachusetts has reworded and/or reorganized some standards.	Wyoming L.3.1: *Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.* *a. Explain the function of nouns, pronouns, verbs, adjectives, and adverbs in general and their functions in particular sentences.* *b. Form and use regular and irregular plural nouns.* *c. Use abstract nouns (e.g., childhood).* *d. Form and use regular and irregular verbs.* *e. Form and use the simple (e.g., I walked; I walk; I will walk) verb tenses.* *f. Ensure subject-verb and pronoun-antecedent agreement.* *g. Form and use comparative and superlative adjectives and adverbs, and choose between them depending on what is to be modified.* *h. Use coordinating and subordinating conjunctions.* i. *Produce simple, compound, and complex sentences.*	Massachusetts *Demonstrate command of the conventions of standard English grammar and usage when writing or speaking; retain and further develop language skills learned in previous grades. (See grade 3 Writing Standard 5 and Speaking and Listening Standard 6 on strengthening writing and presentations by applying knowledge of conventions.)* Sentence Structure and Meaning *a. Produce, expand, and rearrange complete simple, compound, and complex sentences.* *b. Ensure subject-verb and pronoun-antecedent agreement.* *c. Use verbs in the present, past, and future tenses and choose among them depending on the overall meaning of the sentence.* *d. Use coordinating and subordinating conjunctions and choose between them depending on the overall meaning of the sentence.* *e. Form and use comparative and superlative adjectives and adverbs and choose between them depending on what is to be modified and the overall meaning of the sentence.* Word Usage *a. Use abstract nouns.* *b. Form and use regular and irregular plural nouns and the past tense of regular and irregular verbs.*
Massachusetts expanded on Wyoming's standards.	RL.K.6: *With prompting and support, name the*	*With prompting and support, explain that reading*

MASSACHUSETTS		
	author and illustrator of a story and define the role of each in telling the story.	*the cover or title page is how to find out who created a book; name the author and illustrator of a book and define the role of each in telling the story.*
	W.2.3: *Write narratives in which they recount a well elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.*	*Write narratives in prose or poem form that recount a well-elaborated event or experience, or a set of events or experiences; include details and dialogue to show actions, thoughts, and feelings; use temporal words to signal order where appropriate; and provide a sense of closure.* *a. For poems, use words and phrases that form patterns of sounds (e.g., regular beats, alliteration, end rhymes, repeated sounds in words or lines) to create structure. (See Grade 2 Reading Literature Standard 4.)*
	RL.5.4: *Determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes.*	*Determine the meaning of words and phrases as they are used in a text; identify and explain the effects of figurative language such as metaphors and similes.* (See Grade 5 Language Standards 4-6 on applying knowledge of vocabulary to reading.)
Some of Massachusetts' standards are less specific than those of Wyoming.	RL/RI.2.10: *By the end of the year, read and comprehend literature, including stories and poetry, in the grades 2-3 text complexity band proficiently, with scaffolding as needed at the high end of the range.*	*Independently and proficiently read and comprehend literary texts representing a variety of genres, cultures, and perspectives and exhibiting complexity appropriate for at least Grade 2.* [1]

[1] This change is consistently seen for the lower grade level in each common core grade band. In each case the Massachusetts standard removes reference to scaffolding and requires independent reading at the given grade level.

<table>
<tr><th colspan="3">MASSACHUSETTS</th></tr>
<tr><td></td><td>W.3.5: <u>With guidance and support from peers and adults</u>, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including Grade 3 on pages 28 and 29.)</td><td>Develop and strengthen writing as needed by planning, revising, and editing. [2]
a. Demonstrate command of standard English conventions (as described in Language Standards 1-3 up to and including Grade 3).
b. <u>Demonstrate the ability to choose and use appropriate vocabulary (as described in Language Standards 4-6 up to and including Grade 3).</u>
<u>Connections to the Standards for Mathematical Practice 6. Attend to precision.</u></td></tr>
<tr><td></td><td colspan="2">SL.2-5.4: Inclusion of the requirement to apply this standard to mathematical texts.
Example Grade 3: Report on a topic, text, or solution to a mathematical problem, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace and using appropriate vocabulary. (See Grade 3 Language Standards 4-6 for specific expectations regarding vocabulary.)</td></tr>
<tr><td>Some of Massachusetts' standards are less rigorous than those of Wyoming.</td><td>RL.1.5: Explain major differences between books that tell stories and books that give information, drawing on a wide reading of a range of text types.</td><td>Identify characteristics of common types of stories, including folktales and fairy tales.</td></tr>
<tr><td></td><td>W.4.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.
a. Apply Grade 4 Reading standards to literature (e.g., "Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text [e.g., a character's thoughts, words, or actions]").</td><td>Draw evidence from literary or informational texts to support written analysis, reflection, and research, <u>applying one or more</u> Grade 4 standards for Reading Literature or Reading Informational Text <u>as needed.</u> [3]</td></tr>
<tr><td></td><td>b. Apply Grade 4 Reading standards to</td><td></td></tr>
</table>

[2] The same differences are seen in the Grade 4 and 5 standards.
[3] Same differences seen in Grade 5.

MASSACHUSETTS		
	informational texts (e.g., "Explain how an author uses reasons and evidence to support particular points in a text")	
	RI.5.5: *Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.*	*Describe how an author uses one or more structures (e.g., chronology, comparison, cause/effect, problem/solution) of events, to present information in a text.*
Massachusetts provides additional examples for its standards.	RL.K.2, RL.K.3, and W.K.3: *For example, after hearing their teacher read and show the illustrations in Gerald McDermott's picture book version of a traditional African tale, Anansi the Spider, students retell the folktale about the clever spider Anansi and draw pictures to illustrate characters and their interactions at important points in the story.* RL.2.1 and RL.2.4: *For example, students learn the traditional nursery rhyme "As I was going to St. Ives" and point out how its repetitions of sounds affect the meaning and help them find the answer to the mathematical puzzle posed by the speaker in the poem.*	
Massachusetts provides additional guidance by linking standard sets together.[4]	RL/RI.K-5.4: guidance is added linking this standard to the grade level language standards. • Example Kindergarten:RL.K.4: *Ask and answer questions about unknown words in a text. (See kindergarten Language Standards 4-6 on applying knowledge of vocabulary to reading.)* RL/RI.5.1: *Links to Writing standards.* W.K-1.3: *Links to Reading Foundational Skills standards*. W.2-5.3: *Links to Reading Literature standards.* W.K-5.5: *Links to Language standards.* SL.3-5.1: *Links to Reading Literature and Reading Informational Text standards.* SL.1-5.4: *Links to Language standards.* SL.1-5.6: *Links to Language standards.* L.3-5.1: *Links to Writing and Speaking and Listening standards.* L.1-5.6: *Links to Reading Literature, Reading Informational Text, Writing, and Speaking and Listening standards.*	

[4] The Massachusetts standards link to specific standards, however due to differences in numbering across standards the standard numbers have been omitted.

MASSACHUSETTS	
Massachusetts explicitly links its ELA content standard to its mathematics standards. [5]	L.K.1-2: *Links to mathematics standards on counting and cardinality.* L.K-5.6: *Attend to precision.* W.1-5.1: *In math, instead of writing opinions, students write or draw solutions to math word problems and present arguments to explain their thinking. Connections to the Standards for Mathematical Practice 2. Reason abstractly and quantitatively. 3. Construct viable arguments and respond to the reasoning of others.* W.3-5.5: 6. *Attend to precision.* SL.1-5.1: *2. Reason abstractly and quantitatively. 3. Construct viable arguments and respond to the reasoning of others.* SL.3-5.2: 2. *Reason abstractly and quantitatively. 3. Construct viable arguments and respond to the reasoning of others. 6. Attend to precision.* SL.2-5.4: 2. *Reason abstractly and quantitatively. 3. Construct viable arguments and respond to the reasoning of others. 6. Attend to precision.* RI.3-5.7: 2. *Reason abstractly and quantitatively. 6. Attend to precision.*

[5] Massachusetts also provides a list of examples where literacy appears in other content standards such as science, social studies/civics, and social/emotional learning.

NEW HAMPSHIRE	
Overall Finding:	Identical standards.

NEW JERSEY		
Overall Finding: New Jersey's K-5 ELA standards are similar to those of Wyoming. Key differences include the expansion of some standards, a decrease in the level of specificity in a few standards, changes in rigor to some standards, and the exclusion of some standards. In addition, New Jersey dictates specific technology usage in two standards.		
Differences:	**Examples:** Wyoming	New Jersey
Some of New Jersey's standards expand on Wyoming's standards.	RL.2.3: *Describe how characters in a story respond to major events and challenges.*	*Describe how characters in a story respond to major events and challenges <u>using key details</u>.*
	RI.3.8: *Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).*	*Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence) to <u>support specific points the author makes in a text</u>.*
	W.3.10: *Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline specific tasks, purposes, and audiences.*	*Write routinely over extended time frames (time for research, reflection, <u>metacognition/self-reflection</u>, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline specific tasks, purposes, and audiences. (Added to the similar standard in Grades 4 and 5.)*
Some of New Jersey's standards are less specific than those of Wyoming.	RL.4.9: *Compare and contrast the treatment of similar themes and topics (e.g. opposition of good and evil) and patterns of events (e.g., the quest) in stories, myths, and traditional literature <u>from different cultures</u>.*	*Compare, contrast, and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge in the same genre (e.g., mysteries and adventure stories) on their approaches to similar themes and topics. (Reflecting on is addressed under rigor. Also, this is the Grade 5 standard in Wyoming.)*
Some of New Jersey's standards are more rigorous than those of Wyoming.	RL.1.10: *With prompting and support, read prose and poetry of appropriate complexity for Grade 1.*	*With prompting and support, read <u>and comprehend</u> stories and poetry at grade level text complexity or above.*
	RL.3.1: *Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answer.*	*Ask and answer questions, <u>and make relevant connections</u> to demonstrate understanding of a text, referring explicitly to the text as the basis for the answer. (Similar for RL.4.1 and RL.5.1.)*

NEW JERSEY		
	RI.2.8: *Describe how reasons support specific points the author makes in text.*	*Describe <u>and identify the logical connections of</u> how reasons support the specific points the author makes in the text.*
	RI.3.9: *Compare and contrast the most important points and key details presented in two texts on the same topic.*	*Compare and contrast <u>and reflect on</u> (e.g. practical knowledge, historical/cultural context, and background knowledge) the most important points and key details presented in two texts on the same topic. (Reflecting on is also in RI.4.9 and RI.5.9.)*
	RF.K.3: *Know and apply grade-level phonics and world analysis in decoding words.*	*Know and apply grade-level phonics and world analysis in decoding <u>and encoding</u> words. (also added encoding in RF.3.3, RF.4.3, and RF.5.3.*
	RF.1.1: *Demonstrate understanding of the organization and basic features of print.*	*Demonstrate <u>mastery</u> of the organization and basic features of print including those listed under Kindergarten foundation skills.* (Similar for RF.1.2. with mastery instead of understanding.)
Some of New Jersey's standards are less rigorous than those of Wyoming.	RL.2.10: *By the end of the year, read and comprehend literature, including stories and poetry, in the Grades 2-3 text complexity band <u>proficiently</u> with scaffolding as needed <u>at the high end of the range</u>.*	*Read and comprehend literature, including stories and poetry, at grade level text complexity or above with scaffolding as needed.*
	RI.3.10: *By the end of the year, read and comprehend instructional texts, including history/social studies, science, and technical texts, at the high end of the Grades 2-3 text complexity band <u>independently and proficiently</u>.* (Similar for RI.4.10 with *proficiently* and RI.5.10 with *independently and proficiently*.)	*By the end of the year, read and comprehend literary nonfiction at grade-level text complexity or above, with scaffolding as needed.*

NEW JERSEY	
New Jersey does not include a small number of standards, sub-standards, or parts of standards that Wyoming includes.	New Jersey does not include: RF.1.3.f: *Read words with inflectional endings.* RF.1.3.g: *Recognize and read grade-appropriate irregularly spelled words.* W.3.6: *Using keyboarding skills (to publish writing).*
Two of the Speaking and Listening standards for New Jersey dictate specific technology usage.	SL.2.5: Wyoming says, *Create audio recordings of stories or poems…;* New Jersey says, *Use multimedia…* (Same for SL.3.5).

VERMONT	
Overall Finding:	Identical standards.

<table>
<tr><th colspan="2">VIRGINIA</th></tr>
<tr><td colspan="2">Overall Finding: Virginia's K-5 ELA standards vary greatly from those of Wyoming. Virginia is both missing standards included in Wyoming and incorporates additional standards. A few differences in rigor were observed in both directions, however due to the lack of one-to-one correspondence in standards, rigor judgements were only made when the difference in rigor was clear and convincing. A few standards have been moved between grade levels and some have been expanded.</td></tr>
<tr><td>Differences:
Virginia is missing some of the standards included in Wyoming.</td><td>Examples:
Reading Standards for Literature
Standard 1: 5th
Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

Standard 3: Kindergarten
With prompting and support, identify characters, settings, and major events in a story.

Standard 4: 1st, and 2nd
Grade 2: Describe how words and phrases (e.g., regular beats, alliteration, rhymes, repeated lines) supply rhythm and meaning in a story, poem, or song.

Standard 5: Kindergarten, 1st, 3rd, 4th, 5th
Grade 1: Explain major differences between books that tell stories and books that give information, drawing on a wide reading of a range of text types.

Standard 6: 1st, 2nd,5th
Grade 5: Describe how a narrator's or speaker's point of view influences how events are described.

Standard 7: 1st, 2nd, 3rd, 4th, 5th
Grade 3: Explain how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting).

Standard 9: Kindergarten, 1st, 2nd, 3rd, 4th, 5th
Grade 4: Compare and contrast the treatment of similar themes and topics (e.g., opposition of good and evil) and patterns of events (e.g., the quest) in stories, myths, and traditional literature from different cultures.

Standard 10: Kindergarten
Actively engage in group reading activities with purpose and understanding.

Reading Standards for Informational Text:
Standard 1: 5th
Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.</td></tr>
</table>

VIRGINIA	
	Standard 2: Kindergarten *With prompting and support, identify the main topic and retell key details of a text.* Standard 3: Kindergarten, 1st, 2nd, 3rd Grade 3: *Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.* Standard 6: 1st, 3rd, 4th Grade 4: *Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided.* Standard 7: 1st, 2nd, 3rd, 4th, 5th Grade 1: *Use the illustrations and details in a text to describe its key ideas.* Standard 8: Kindergarten, 1st, 2nd, 3rd, 4th Grade 2: *Describe how reasons support specific points the author makes in a text.* Standard 9: Kindergarten, 1st, 2nd, 3rd, 4th Grade 3: *Compare and contrast the most important points and key details presented in two texts on the same topic.* Standard 10: Kindergarten *Actively engage in group reading activities with purpose and understanding*. Writing Standard 5: Kindergarten *With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed.* Standard 6: Kindergarten, 1st, 2nd, 3rd, 4th, 5th Grade 2: *With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.* Speaking and Listening Standard 2: Kindergarten, 1st Grade 1: *Ask and answer questions about key details in a text read aloud or information presented orally or through other media.*

VIRGINIA	
	Standard 3: 4th *Identify the reasons and evidence a speaker provides to support particular points.* Standard 4: Kindergarten, 1st Kindergarten: *Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.* Standard 5: Kindergarten, 1st Grade 1: *Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.* Language Standards: Standard 3: 3rd *Use knowledge of language and its conventions when writing, speaking, reading, or listening.* *a. Choose words and phrases for effect.* *b. Recognize and observe differences between the conventions of spoken and written standard English.* Standard 4: Kindergarten *Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on kindergarten reading and content.* *a. Identify new meanings for familiar words and apply them accurately (e.g., knowing duck is a bird and learning the verb to duck).* *b. Use the most frequently occurring inflections and affixes (e.g., -ed, -s, re-, un-, pre-, -ful, -less) as a clue to the meaning of an unknown word.* Standard 5: Kindergarten, 1st, 2nd Grade 2: *With guidance and support from adults, demonstrate understanding of word relationships and nuances in word meanings.* *a. Sort words into categories (e.g., colors, clothing) to gain a sense of the concepts the categories represent.* *b. Define words by category and by one or more key attributes (e.g., a duck is a bird that swims; a tiger is a large cat with stripes).* *c. Identify real-life connections between words and their use (e.g., note places at home that are cozy).* *d. Distinguish shades of meaning among verbs differing in manner (e.g., look, peek, glance, stare, glare, scowl) and adjectives differing in intensity (e.g., large, gigantic) by defining or choosing them or by acting out the meanings.* Most grade levels are also missing numerous language sub-standards.

VIRGINIA		
Some of Virginia's writing standards are less explicit than those of Wyoming and vary in scope.	Wyoming W.K.1: *Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book (e.g., My favorite book is . . .).* W.K.2: *Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.* W.K.3: *Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.*	Virginia K.11: *The student will write in a variety of forms to include narrative and descriptive.* *a. Differentiate pictures from writing.* *b. Use prewriting activities to generate ideas including drawing pictures.* *c. Use letters to phonetically spell words that describe pictures or experiences.* *d. Write left to right and top to bottom.* *e. Compose simple sentences.* *f. Begin each sentence with a capital letter and use ending punctuation.* *g. Share writing with others.*
Virginia includes additional standards.	Kindergarten (*n* = 20): *Express ideas in complete sentences and express needs through direct requests.* *Initiate conversations.* *Participate in a variety of oral language activities including choral and echo speaking and recitation.* Grade 1 (*n* = 34): *Add or delete phonemes to make new words.* *Discuss meanings of words in context.* *Make and confirm predictions.* Grade 2 (*n* = 24): *Give multi-step directions.* *Use prior and background knowledge as context for new learning.*	

VIRGINIA		
	Begin to sign his/her first and last names. Grade 3 (*n* = 28) *Identify the conflict and resolution.* *Draw conclusions using the text for support.* *The student will write legibly in cursive.* Grade 4 (*n* = 24): *Differentiate between auditory, visual, and written media messages and their purposes.* *Compare/contrast details in literary and informational nonfiction texts.* *Use a variety of prewriting strategies.* Grade 5 (*n* = 22): *Identify the characteristics and effectiveness of a variety of media messages.* *Use reading strategies throughout the reading process to monitor comprehension.* *Locate information from the text to support opinions, inferences, and conclusions.*	
Virginia's standards for writing research (W7, and W8) are more rigorous than those of Wyoming.	W.K.7: *Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).* W.K.8: *With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.*	K.12: *The student will conduct research to answer questions or solve problems using available resources.* *a. Generate topics of interest.* *b. Generate questions to gather information.* *c. Identify pictures, texts, or people as sources of information.* *d. Find information from provided sources.*

VIRGINIA		
In a few cases, Virginia's standards are less rigorous than those of Wyoming.	RL.1.3: *Describe characters, settings, and major events in a story, using key details.* RL.2.1: *Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.* RI.5.5: *Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.*	*Identify characters, setting, and important events.* *Ask and answer questions using the text for support.* *Draw conclusions based on the text.* *Identify cause and effect relationships.*
In Virginia, some standards drop off once proficiency has been reached instead of keeping these.	RF.4-5.3: *Know and apply grade-level phonics and word analysis skills in decoding words.* *a. Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.* RF.5.4b: *Read on-level text orally with accuracy, appropriate rate, and expression on successive readings.*	
Virginia has moved one standards between grade levels.	RF.K.1c: *Understand that words are separated by spaces in print*, is a first grade standard in Virginia.	
Virginia has expanded on some of the standards of Wyoming.	SL.k.6: *Speak audibly and express thoughts, feelings, and ideas clearly.*	K.2: *The student will demonstrate growth in oral, early literacy skills.* *a. Listen and respond to a variety of text and media.* *b. Participate in a variety of oral language activities including choral and echo speaking and recitation.* *c. Tell stories orally.* d. *Participate in creative dramatics.*

VIRGINIA		
Virginia's Language standards differ from those of Wyoming in scope and sequence.	L.5.1: D*emonstrate command of the conventions of standard English grammar and usage when writing or speaking.* *a. Explain the function of conjunctions, prepositions, and interjections in general and their function in particular sentences.* *b. Form and use the perfect (e.g., I had walked; I have walked; I will have walked) verb tenses.* *c. Use verb tense to convey various times, sequences, states, and conditions.* *d. Recognize and correct inappropriate shifts in verb tense.* *e. Use correlative conjunctions (e.g., either/or, neither/nor).*	5.8:[6] *The student will self- and peer-edit writing for capitalization, spelling, punctuation, sentence structure, paragraphing, and Standard English.* *a. Use plural possessives.* *b. Use adjective and adverb comparisons.* *c. Use interjections.* *d. Use prepositional phrases.* *e. Use quotation marks with dialogue.* *f. Use commas to indicate interrupters, items in a series, and to indicate direct address.* *g. Use a hyphen to divide words at the end of a line.* *h. Edit for fragments and run-on sentences.* *i. Eliminate double negatives.* *j. Use correct spelling of commonly used words.* *k. Use coordinating conjunctions.*

[6] Some of these standards appear at earlier grade levels in Wyoming, e.g., 5.8 a-c.

ENGLISH LANGUAGE ARTS STANDARDS 6-12: SELECTED STATES IN THE REGION BASED ON HIGH ACADEMIC PERFORMANCE

All standards are numbered following the conventions of Wyoming when possible.

INDIANA	
Overall Finding:	Indiana's standards 6-12 ELA standards are similar to those of Wyoming. Indiana includes additional standards targeting media literacy along with six other additional standards, and revised language standards. Other changes include the restructuring of some of the standards, some changes in rigor and scope, and the movement of some standards between grade levels.
Differences: Indiana includes additional standards.	**Examples:** W.6.1e: *Usage – Writing simple, compound, complex, and compound-complex sentences; recognizing sentence fragments and run-ons.* 7.W.6.1b: *Verbs – Recognizing and correcting problems with subject/verb agreement.* 9-10.W.6.1b: *Verbs – Forming and using verbs in the indicative, imperative, interrogative, conditional, and subjunctive moods.* 9-10.RL.3.2: *Analyze how the author creates such effects as suspense or humor through differences in the points of view of the characters and the reader (e.g., created through the use of dramatic irony).* 11-12.RL.2: *Compare and contrast the development of similar themes or central ideas across two or more works of literature and analyze how they emerge and are shaped and refined by specific details.* 11-12.RI.2: *Compare and contrast the development of similar central ideas across two or more texts and analyze how they emerge and are shaped and refined by specific details.*
Indiana includes standards targeting media literacy.	6-12.ML.1: *Critically analyze information found in electronic, print, and mass media used to inform, persuade, entertain, and transmit culture.* 6.ML.2.1: *Use evidence to evaluate the accuracy of information presented in multiple media messages.* 7.ML.2.1: *Interpret the various ways in which events are presented and information is communicated by visual image-makers to influence the public.* 8.ML.2.1: *Identify and analyze persuasive and propaganda techniques used in visual and verbal messages by electronic, print and mass media, and identify false or misleading information.*

INDIANA	
	9-10.ML.2.1: *Analyze how media include or exclude information from visual and verbal messages to achieve a desired result.* 11-12.ML.2.1: *Evaluate the intersections and conflicts between visual and verbal messages, and recognize how visual techniques or design elements carry or influence messages in various media.* 6.ML.2.2: *Identify the target audience of a particular media message, using the context of the message (e.g., where it is placed, when it runs, etc.).* 7.ML.2.2: *Analyze the ways that the media use words and images to attract the public's attention.* 8.ML.2.2: *Analyze and interpret how people experience media messages differently, depending on point of view, culture, etc*. 9-10.ML.2.2: *Analyze and interpret the changing role of the media over time in focusing the public's attention on events and in forming their opinions on issues.* 11-12.ML.2.2: *Analyze the impact of the media on the public, including identifying and analyzing rhetorical and logical fallacies.*
Indiana has revised the Language standards.	Language standards are organized into the following categories: Pronouns, Verbs, Adjectives and Adverbs, Phrases and Clauses, Usage, Capitalization, Punctuation, and Spelling. When a new standard is not explicit the following text appears: 9-10.W.6.1c: *Adjectives and Adverbs – Students are expected to build upon and continue applying conventions learned previously.*
Some of Indiana's standards are more rigorous than those of Wyoming.	Wyoming: RL.6.6: *Explain how an author develops the point of view of the narrator or speaker in a* text. Indiana: *Explain how an author develops the point of view of the narrator or speaker in a work of literature and how the narrator or speaker impacts the mood, tone, and meaning of a text.* Wyoming: RI.7.8: *Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.* Indiana: *Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims, noting instances of bias and stereotyping.*

INDIANA		
	SL.8.1a: *Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.*	*Examine, analyze, and reflect on ideas under discussion by identifying specific evidence from materials under study and other resources.*
	RL.9-10.9: *Analyze how an author draws on and transforms source material in a specific work (e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare).*	*Analyze and evaluate how works of literary or cultural significance (American, English, or world) draw on themes, patterns of events, or character types from myths, traditional stories, or religious works, including describing how the material is rendered new.*
Some of Indiana's standards have a different scope than those of Wyoming.	RL.8.6: *Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.*	*Analyze a particular point of view or cultural experience in a work of world literature considering how it reflects heritage, traditions, attitudes, and beliefs.*
	RI.11-12.8: *Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses).*	*Delineate and evaluate the arguments and specific claims in seminal U.S. and world texts, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.*

MASSACHUSETTS

Overall Finding: Massachusetts' 6-12 ELA standards vary from those adopted by Wyoming in a number of key ways. Massachusetts includes additional standard sets targeting ELA skills in content areas differentiating between reading standards for science, career and technical subjects, and history/social studies and including speaking and listening standards for content areas. Massachusetts also added language and writing sub-standards. Other changes to the Massachusetts standards include the expansion of some standards, a decrease in specificity for some standards, a change in scope and sequence of standards, and several standards were changed to be either more or less rigorous. Massachusetts also provides additional guidance by including additional examples, and making explicit links between ELA standard sets.

Differences:	**Examples:**	
Massachusetts includes additional standards.	Massachusetts includes separate ELA standards for History/Social Studies, Science and Career and Technical Subjects, and Content Areas.	
Massachusetts includes additional sub-standards for Language and Writing standards.	W.6-12.5b: *Demonstrate the ability to select accurate vocabulary.* L.6.3b: *Recognize variations from standard or formal English in writing and speaking, determine their appropriateness for the intended purpose and audience, and make changes as necessary.* L.9-10.1c: *Manipulate and rearrange clauses and phrases in sentences, paying attention to agreements of pronouns and their antecedents, logical use of verb tenses, and variety in sentence patterns.* L.11-12.3b: *Revise and edit to make work more concise and cohesive.*	
Massachusetts expanded on Wyoming's standards.	RL/RI.6.1: *Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.*	[7]*Cite textual evidence to support analysis of what a text states explicitly as well as inferences drawn from the text, quoting or paraphrasing as appropriate. (See Grade 6 Writing Standard 8 for more on quoting and paraphrasing.)*
	W.6.3d: *Use precise words and phrases, relevant descriptive details, and sensory language to convey experiences and events.*	*Use precise words and phrases, relevant descriptive details, figurative and sensory language, and techniques such as personification (e.g., "the fog crept in") to convey experiences or events.*
	RL.7.4: *Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama.*	*Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning, tone, or mood, including the impact of repeated use of particular images.*
	RI.8.5: *Analyze in detail the structure of a*	*Analyze in detail the structural elements of a text,*

[7] The same changes are seen in the Grades 7 and Grade 8 standards.

MASSACHUSETTS		
	specific paragraph in a text, including the role of particular sentences in developing and refining a key concept.	*including the role of specific sentences, paragraphs, and text features in developing and refining a key concept.*
Some of Massachusetts' standards are less specific than those of Wyoming.	RL.6.7: *Compare and contrast the experience of reading a story, drama, or poem to listening to or viewing an audio, video, or live version of the text, including contrasting what they "see" and "hear" when reading the text to what they perceive when they listen or watch.*	*Compare and contrast the experience of reading a story, drama, or poem to that of listening to or viewing the same text.*
	RL.7.7: *Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version, analyzing the effects of techniques unique to each medium (e.g., lighting, sound, color, or camera focus and angles in a film).*	*Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version.*
	RL.11-12.4: *Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)*	*Determine the figurative or connotative meaning(s) of words and phrases as they are used in a text; analyze the impact of specific words or rhetorical patterns (e.g., how the language evokes a sense of time and place, how shifts in rhetorical patterns signal new perspectives).*
Some of Massachusetts' standards are more rigorous than those of Wyoming.	RL/RI.6.10: *By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the Grades 6-8 text complexity band proficiently, with scaffolding as needed at the high end of the range.*	*Independently*[8] *and proficiently read and comprehend literary texts representing a variety of genres, cultures, and perspectives and exhibiting complexity appropriate for at least Grade 6.*

[8] The same change is seen in the RL/RI 10 standard for Grades 7, 9-10, and 11-12.

MASSACHUSETTS		
	RI.6.4: *Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.*	*Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; explain how word choice affects meaning and tone. (See Grade 6 Language Standards 4-6 on applying knowledge of vocabulary to reading.)*
	W.6-8.6: *Massachusetts does not include language indicating that this standard can be met, "With some guidance and support from peers and adults".*	
A few of Massachusetts' standards are less rigorous than those of Wyoming.	W.6.9: *Draw evidence from literary or informational texts to support analysis, reflection, and research.* *a. Apply Grade 6 Reading standards to literature (e.g., "Compare and contrast texts in different forms or genres [e.g., stories and poems; historical novels and fantasy stories] in terms of their approaches to similar themes and topics").* *b. Apply Grade 6 Reading standards to literary nonfiction (e.g., "Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not").*	[9] *Draw evidence from literary or informational texts to support written analysis, interpretation, reflection, and research, applying one or more Grade 6 standards for Reading Literature or Reading Informational Text as needed.*
Several Massachusetts standards differ in both scope and/or sequence than those of Wyoming.	L.6.1: *Massachusetts' L1 standard includes two standards seen at 7th grade in Wyoming, along with an application based question.*	
	RL.9-10.7: *Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment (e.g., Auden's "Musée des Beaux Arts" and Breughel's Landscape with the Fall of Icarus).*	*Analyze a critical response to a work or body of literature (e.g., author documentary, book review); provide a summary of the argument presented and evaluate the strength of the evidence supporting it.*

[9] This same change is seen for Grades 7 and 8.

MASSACHUSETTS	
	RL.11-12.7: *Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.)* *Analyze one or more critical responses to a work or body of literature, including how the critical lens (e.g., formal, historical, feminist, sociological, psychological) influences the interpretation.*
Massachusetts provides additional examples for its standards.	RL.6.3: *For example, students read Black Ships Before Troy, Rosemary Sutcliff's retelling of Homer's Iliad. As they read, they keep journals in which they keep track of the plot and relationships among characters and their motivations, and they make illustrations of scenes in the epic. They discuss the characteristics of a hero in classical Greek literature and write essays about a character of their choice, arguing whether or not the character is a hero. (RL.6.1, RL.6.3, W.6.1)*
Massachusetts provides additional guidance by linking standard sets together.[10]	RL/RI.6-8.1: *Links to Writing standards.* RL/RI.6-12.4: *Links to Language standards.* W.6-12.5: *Links to Language standards.* SL.6-12.1: *Links to Reading Literature and Reading Informational Text standards.* SL.6-12.4: *Links to Language standards.* SL.6-12.6: *Links to Language standards.* L.6-12.1: *Links to Writing and Speaking and Listening standards.* L.6-12.6: *Links to Reading Literature, Reading Informational Text, Writing, and Speaking and Listening standards.*

[10] The Massachusetts standards link to specific standards, however due to differences in numbering across standards the standard numbers have been omitted.

NEW HAMPSHIRE	
Overall Finding:	Identical standards.

NEW JERSEY		
Overall Finding: New Jersey's 6-12 ELA standards are similar to those of Wyoming. Key differences include the expansion of some standards, changes in rigor to some standards, and a change in the scope of a few standards.		
Differences:	**Examples:**	
	Wyoming	New Jersey
Some of New Jersey's standards expand on those of Wyoming.	RI.11-12.8: *Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses).*	*Describe and evaluate the reasoning in seminal U.S. <u>and global</u> texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses). ("and/or global history" is used in RI.11-12.8).*
	W.6.10. *Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.*	*Write routinely over extended time frames (time for research, reflection, <u>metacognition/self correction</u>, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. (Same for W.7.10 and W.8.10, WHST.6-8.10.)*
	W.9-10.5. *Develop and strengthen writing as needed by planning, revising, editing, rewriting, trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.*	*Develop and strengthen writing as needed by planning, revising, editing, rewriting, trying a new approach, <u>or consulting a style manual (such as MLA or APA Style</u>), focusing on addressing what is most significant for a specific purpose and audience. (MLA or APA style manuals also added to W.9-10.8, W.11-12.5, and W.11-12.8.)*
Some of New Jersey's standards are more rigorous than those of Wyoming.	RL.6.9: *Compare and contrast texts in different forms or genres (e.g., stories and poems; historical novels and fantasy stories) in terms of their approaches to similar themes and topics.*	*Compare, contrast <u>and reflect on</u> (e.g. practice knowledge, historical/cultural context, and background knowledge) texts in different forms or genres (e.g., stories and poems; historical novels and fantasy stories) in terms of their approaches to similar themes and topics. ("reflecting on" is also in RL.7.9, RL.8.9, RL.9-10.9, and RL.11-12.9.)*
	RL.9-10.1: *Cite strong and thorough textual*	*Cite strong and thorough textual evidence <u>and</u>*

NEW JERSEY		
	evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	*make relevant connections to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain. (Same for RL.11-12.1.)*
	RI.9-10.1: *Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.*	*Accurately cite strong and thorough textual evidence (e.g., via discussion, written response, etc.) and make relevant connections to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain. (Accurately and the last part of the sentence are in RI.11-12.1 but not making relevant connections.)*
	RI.9-10.9: *Analyze documents of historical and literary significance, (e.g., Washington's Farewell Address the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail", Declaration of the Rights of Man and Citizen, U.N. Universal Declaration of Human Rights, etc.), including how they relate in terms of themes and significant concepts.*	*Analyze and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) documents of historical and literary significance, (e.g., Washington's Farewell Address the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail", Declaration of the Rights of Man and Citizen, U.N. Universal Declaration of Human Rights, etc.), including how they relate in terms of themes and significant concepts. (Reflecting on is including in RI.11-12.9.)*
Some of New Jersey's standards are less rigorous than those of Wyoming.	RL.6.10: *By the end of the year, read and comprehend literature, including stories, drama, and poems, in the Grades 6-8 text complexity band proficiently, with scaffolding as needed at the high end of the range. (Similar for RL.7.10, RL.8.10, RL.9-10.10, and RL.11-12.10, with independently added after proficiently in Grade 8 and Grades 11-12.)*	*By the end of the year read and comprehend literature, including stories, dramas, and poems at grade level text-complexity or above, scaffolding as needed.*

NEW JERSEY		
	SL.11-12.4: *Present information, findings, and supporting evidence, conveying a clear and distinct perspective, <u>such that listeners can follow the line of reasoning, alternate or opposing perspectives are addressed</u>, and the organization, development, substance, and style are appropriate to the purpose, audience, and a range of formal and informal tasks.*	*Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.*
The scope of some of New Jersey's standards differs from that of Wyoming.	SL.9-10.1.b: *Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.*	*Collaborate with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), develop clear goals and <u>assessment criteria (e.g., student developed rubric</u>), and individual roles as needed. (Same in SL.11-12.1.b.)*
	L.9-10.3. *Apply knowledge of language <u>to understand how language functions in different contexts</u>, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.* *a. Write and edit work so that it conforms to the guidelines in a style manual (e.g., MLA Handbook, Turabian's Manual for Writers) appropriate for the discipline and writing type. (Similar for L.11-12.3.a where Wyoming adds in consulting references.)*	*Apply knowledge of language to make effective choices for meaning, or style, and to comprehend more fully when reading or listening.* *<u>a. Vary word choice and sentence structure to demonstrate an understanding of the influence of language</u>.*

VERMONT	
Overall Finding:	Identical standards

VIRGINIA	
Overall Finding: Virginia's 6-12 ELA standards vary greatly from those of Wyoming. Virginia is both missing standards included in Wyoming and incorporates additional standards. A few differences in rigor were observed, however due to the lack of one-to-one correspondence in standards, rigor judgements were only made when the difference in rigor was clear and convincing. In addition, a few standards display less specificity than those in Wyoming. Virginia also delineates standards by grade level at the 9-12 level.	
Differences: Virginia is missing some of the standards included in Wyoming.	**Examples:** Reading for Literature Standard 5: 6th *Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.* Standard 6: 11-12 *Analyze a case in which grasping point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).* Standard 7: 11-12 *Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.)* Standard 9: 8th, 9-10 Grade 8: *Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new.* Reading for Informational Text: Standard 3: 6th *Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).* Standard 5: 11-12 *Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.* Standard 6: 6th *Determine an author's point of view or purpose in a text and explain how it is conveyed in the text.*

VIRGINIA	
Virginia has some additional standards not included in Wyoming.	Standard 9: 11-12 *Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.* Writing Standards: Standard 6: 6th, 7th Grade 7: *Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.* *Numerous writing and language sub-standards across grade levels.* Grade 6 (*n* = 16): 6.1h: *Evaluate own contributions to discussions.* 6.6a: *Skim materials using text features such as type, headings, and graphics to predict and categorize information.* Grade 7 (*n* = 17): 7.3b: *Distinguish between fact and opinion, and between evidence and infere*nce. 7.9f: *Demonstrate ethical use of the Internet.* Grade 8 (*n*= 14): 8.1g: *Use self-reflection to evaluate one's own role in preparation and participation in small-group activities.* 8.2g: *Evaluate presentations.* Grades 9 and 10 (*n* = 23): 9.7d: *Distinguish between active and passive voice.* 9.6a: *Engage in writing as a recursive process.*

<table>
<tr><th colspan="3">VIRGINIA</th></tr>
<tr><td></td><td colspan="2">Grade 11-12 (n = 33):
11.5b: Read and correctly interpret an application for employment, workplace documents, or an application for college admission.

12.2e: Evaluate sources including advertisements, editorials, political cartoons, and feature stories for relationships between intent and factual content.</td></tr>
<tr><td>Some of Virginia’s standards are less rigorous than those of Wyoming.</td><td>Wyoming
RL.6.5: Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.</td><td>Virginia
Identify transitional words and phrases that signal an author’s organizational pattern.</td></tr>
<tr><td></td><td>RL.7.6: Analyze how an author develops and contrasts the points of view of different characters or narrators in a text.</td><td>Differentiate between first and third person point-of-view.</td></tr>
<tr><td></td><td>RI.6.5: Analyze how an author’s choices concerning how to structure a text, order events within it (e.g., parallel plots), and manipulate time (e.g., pacing, flashbacks) create such effects as mystery, tension, or surprise.</td><td>Identify transitional words and phrases that signal an author’s organizational pattern.</td></tr>
<tr><td>Some of Virginia’s standards are less specific than those of Wyoming.</td><td>RL.7.9: Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history.</td><td>Compare and contrast various forms and genres of fictional text.</td></tr>
<tr><td></td><td>W.6.1b: Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.</td><td>Establish a central idea incorporating evidence and maintaining an organized structure.</td></tr>
</table>

Appendix C

Mathematics Standards

MATH STANDARDS K-5: STATES IN THE REGION

All standards are numbered following the conventions of Wyoming when possible.

COLORADO	
Overall Finding: Colorado's K-5 math standards are similar to those of Wyoming with four key differences. Colorado: (1) does not include the parts of some standards; (2) includes additional standards, many of which target personal financial literacy; (3) makes some slight revisions, additions and reorganization; and (4) includes additional guidance.	
Differences:	**Examples:**
Colorado does not include parts of some standards.	1.NBT.4: *Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction;* ~~*relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.*~~ 5.NF.4: *Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.*
Colorado reorganized some standards.	In the Grade 4 Numbers and Operations in Base Ten standards, Colorado does not include, *Illustrate and explain multiplication and division calculation by using equations, rectangular arrays, and/or area models, as a separate standard. Instead, this is included in standards 4-NBT.6 and 4.NBT.6.*
Colorado has additional standards, most of which are Personal Financial Literacy standards.	Kindergarten: *Identify small groups of objects fewer than five without counting.* Grade 1: *Identify coins and find the value of a collection of two coins.* *Compare two sets of objects, including pennies, up to at least 25 using language such as "three more or three fewer."* Grade 3: *Model strategies to achieve a personal financial goal using arithmetic operations.* Grade 5: *Use patterns to solve problems including those involving saving and checking accounts.* *Explain, extend, and use patterns and relationships in solving problems, including those involving saving and checking accounts such as understanding that spending more means saving less.*

IDAHO	
Overall Finding:	Identical standards.

MONTANA	
Overall Finding: The only difference between Montana's and Wyoming's K-5 math standards is the inclusion by Montana of content relevant to American Indians.	
Differences: Montana includes content relevant to American Indians.	**Examples:** K.CC.4a: *When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object <u>from a variety of cultural contexts, including those of Montana American Indians.</u>* K.CC.5: *Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects <u>from a variety of cultural contexts, including those of Montana American Indians.</u>* 4.NF.4c: *Solve word problems within cultural contexts, including those of Montana American Indians, involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie<u>? As a contemporary American Indian example, for family/cultural gatherings the Canadian and Montana Cree bake bannock made from flour, salt, grease, and baking soda, in addition to ¾ cup water per pan. When making four pans, how much water will be needed?</u>*

<table>
<tr><th colspan="2">NEBRASKA</th></tr>
<tr><td colspan="2">Overall Finding: Nebraska's K-5 math standards are not based on the CCSS but are similar to those of Wyoming in that they cover many of the same topics. However, the Nebraska standards are less comprehensive as they do not include many of the standards and sub-standards that Wyoming includes.</td></tr>
<tr><td>Differences:
Nebraska does not include many of the standards and sub-standards that Wyoming includes.</td><td>Examples:
3.MD.5: Recognize area as an attribute of plane figures and understand concepts of area measurement.
a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

In the following standard, only the underlined portion is included in Nebraska's standards.
4.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).
b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)
c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</td></tr>
</table>

NORTH DAKOTA	
Overall Finding:	North Dakota's K-5 math standards generally mirror those of Wyoming. However, North Dakota includes an annotation section next to each standard that includes examples and any additional guidance. Some of this information is included in the Wyoming standards or glossary, however, additional examples were also added by North Dakota. Additionally, North Dakota reorganized some standards, moving information between standards in the same standard set. North Dakota added standards, did not include some parts of standards that Wyoming includes, and made changes to the specificity and rigor of some standards.
Differences:	**Examples:**
North Dakota includes additional standards.	North Dakota includes standards on counting backwards. 1.MD.5: *Identify and tell the value of a dollar bill, quarter, dime, nickel, and penny.* 1.MD.6: *Count and tell the value of combinations of dimes and pennies up to one dollar.* 5.OA.4:[1] *Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.*
North Dakota does not include standards or parts of some of the standards that Wyoming does.	K.G.5: *Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.* 2.MD.5: *Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.* 2.NBT.9: *Explain why addition and subtraction strategies work, using place value and the properties of operations.*
In some cases, North Dakota has specified limits to the standards not included in Wyoming's standards.	For example, in K.CC.2 the language is added to specify that counting forward is only required from a given number within 100.

[1] This standard is included at Grade 4 in Wyoming. North Dakota includes a simplified version of this standard at Grade 4.

NORTH DAKOTA		
Some of North Dakota's standards are less rigorous than those of Wyoming.	Wyoming K.G.1: *Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.*	North Dakota *Describe objects in the environment using names of shapes and solids (squares, circles, triangles, rectangles, cubes, and spheres).*
	4.OA.4: *Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.*	*Find all factor pairs for a whole number in the range 1-36. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-36 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-36 is prime or composite.*
In some cases, North Dakota's standards are less specific than those of Wyoming.	K.MD.2: *Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.*	*Compare two objects with a common measurable attribute and describe the difference.*
North Dakota has expanded on some of Wyoming's standards.	3.OA.1: *Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.*[2]	*Interpret <u>and model</u> products of whole numbers.*

[2] The examples has been moved to the annotation.

SOUTH DAKOTA	
Overall Finding:	Identical standards.

UTAH

Overall Finding: Utah's K-5 math standards generally mirror those of Wyoming with a few key differences. Utah added one additional standard to grade 1 concerning money. In addition, Utah expanded a number of standards and in a few standards, added language to specify strategy usage or provide additional guidance on the implementation of the standard.

Differences:	**Examples:**	
Utah includes an additional standard.	1.MD.5: *Identify the values of pennies, nickels, dimes and quarters and know their comparative values. (For example, a dime is of greater value than a nickel.) Use appropriate notation to designate a coin's value. (For example, 5¢.)*	
Several of Utah's standards are more expansive than those of Wyoming.	Wyoming 3.OA.6: *Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*	Utah *Understand division as an unknown-factor problem. <u>Understand the relationship between multiplication and division (multiplication and division are inverse operations)</u>. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*
	3.NF.1: *Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.*	*Understand that a unit fraction has a numerator of one and a non-zero denominator.* a. *Understand a fraction 1/b as the quantity formed by one part when a whole is partitioned into b equal parts.* b. *Understand a fraction a/b as the quantity formed by a parts of size 1/b. For example: 1/4 + 1/4 + 1/4 = 3/4.*
Utah expanded a few standards to specify strategy usage.	K.CC.6: *Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.*[1] *Include groups with up to ten objects.*	*Use matching or counting strategies to identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group. Include groups with up to ten objects.*
Utah expanded a few standards to provide additional guidance.	4.NF.3: *Understand a fraction a/b with a >1 as a sum of fractions 1/b.*	*Understand a fraction a/b with a >1 as a sum of fractions 1/b. In other words, any fraction is a sum of unit fractions.*

COLORADO	
Overall Finding:	Colorado's 6-12 math standards are very similar to those of Wyoming with two key differences. Colorado: (1) does not include the parts of some standards or any of the plus standards, and (2) includes additional standard many of which target personal financial literacy. Other minor changes included some slight revisions, additions and reorganization of the standards and the inclusion of additional guidance.
Differences:	**Examples:**
Colorado includes additional standards.	Grade 6: *Express the comparison of two whole number quantities using differences, part-to-part ratios, and part-to-whole ratios in real contexts, including investing and saving.* Grade 7: *Estimate and compute unit cost of consumables (to include unit conversions if necessary) sold in quantity to make purchase decisions based on cost and practicality.* Grade 8: *Analyze how credit and debt impact personal financial goals.* High School: *Define and explain the meaning of significance, both statistical (using p-values) and practical (using effect size).* *Describe factors affecting take-home pay and calculate the impact.*
Colorado does not include any of the 'plus' standards seen in Wyoming's standards.	N-CN.3: *Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.* N.VM.1: *Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, |v|, ||v||, v).*

IDAHO	
Overall Finding:	Identical standards.

MONTANA	
Overall Finding:	Montana's 6-12 math standards are almost identical to those of Wyoming with two key differences. Montana has included additional content relevant to American Indians and is missing part of one standard.
Differences:	**Examples:**
Montana includes content relevant to American Indians.	6.RP.3b: *Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? <u>As a contemporary American Indian example, it takes at least 16 hours to bead a Crow floral design on moccasins for two children. How many pairs of moccasins can be completed in 72 hours?</u>* 8.G.1: *Verify experimentally the properties of rotations, reflections, and translations <u>from a variety of cultural contexts, including those of Montana American Indians</u>.* N-Q.1: *Use units as a way to understand problems <u>from a variety of contexts (e.g., science, history, and culture), including those of Montana American Indians</u>, and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.*
Montana is missing a part of one of Wyoming's standards.	8.NS.1: *~~Know that numbers that are not rational are called irrational~~. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.*

<table>
<tr><th colspan="3">NEBRASKA</th></tr>
<tr><td colspan="3">Overall Finding: Nebraska's 6-12 math standards are not based on the CCSS but cover many topics similar to those of Wyoming. However, Nebraska's standards are less comprehensive as many of the standards, sub-standards, and some area are not included that Wyoming includes. In general, Wyoming's standards are more specific and at times more rigorous.</td></tr>
<tr><td>Differences:</td><td colspan="2">Examples:</td></tr>
<tr><td>Many of Wyoming's standards and some areas are not covered in the Nebraska standards.</td><td colspan="2">Many of standards targeting Vector and Matrix Quantities are not covered in Nebraska (N-VM).

7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

Functions standards for Wyoming begin in Grade 8 but in Nebraska functions are not covered until high school.</td></tr>
<tr><td>Many of Nebraska's standards are less specific than those of Wyoming.</td><td>Wyoming
6.G.2: Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

8.G.6: Explain a proof of the Pythagorean Theorem and its converse.</td><td>Nebraska
MA.6.3.3.c: Apply volume formulas for rectangular prisms.

MA.8.3.3.a: Explain a model of the Pythagorean Theorem.</td></tr>
<tr><td>Some of Nebraska's standards are less rigorous than those of Wyoming.</td><td>6.EE.1: Write and evaluate numerical expressions involving whole-number exponent.

7.RP.3: Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</td><td>Evaluate expressions with positive exponents.

Solve problems using proportions and ratios (e.g., cross products, percents, tables, equations, and graphs).</td></tr>
</table>

NORTH DAKOTA		
Overall Finding:	North Dakota's 6-12 math standards generally mirror those of Wyoming. However, North Dakota includes an annotation section next to each standard that includes examples and any additional guidance. Some of this information is included in the Wyoming standards or glossary, however, numerous additional examples were also added. North Dakota added one standard and did not include three standards that Wyoming includes. Changes were also made to the specificity and rigor of some standards.	
Differences:	**Examples:**	
North Dakota added one standard.	HS.G-GMD.2:[3] *Calculate the surface area for prisms, cylinders, pyramids, cones, and spheres to solve problems.*	
North Dakota eliminated three standards and part of one standard that Wyoming Includes.	HS.A-APR.5: *Know and apply the Binomial Theorem for the expansion of (x + y)n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.* HS.G-GMD.1: *Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.* HS.G-GMD.2: *Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures*. HS.S-IC.5: *Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.*	
A few of North Dakota's standards are more rigorous than those of Wyoming	Wyoming	North Dakota
	8.EE.2: *Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.*	*Use square root and cube root symbols to represent solutions to equations of the form* $x^2 = p$ *and* $x^3 = p$*, where* p *is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Classify radicals as rational or irrational.*
	HS.F-LE.4: *For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology*.	*Use logarithms to express the solution to abct = d where a, c, and d are real numbers and b is a positive real number. Evaluate the logarithm using technology when appropriate.*

[3] This standard replaces the standard with the same number seen in Wyoming.

NORTH DAKOTA		
	HS.G-CO.8: *Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.*	*Prove two triangles are congruent using the congruence theorems such as ASA, SAS, and SSS.*
In one case, North Dakota reclassified part of a standard as regular not 'plus' standard thus increasing the rigor.	HS.F-TF.3: *(+) Use special triangles to determine geometrically the values of sine, cosine, tangent for π/3, π/4 and π/6, and use the unit circle to express the values of sine, cosine, and tangent for π–x, π+x, and 2π–x in terms of their values for x, where x is any real number.*	*Use special triangles to determine geometrically the values of sine, cosine, tangent for ππ/3, ππ/4 and ππ/6.* *(+) Use the unit circle to express the values of sine, cosine, and tangent for ππ − xx, ππ + xx, and 2ππ − xx, in terms of their values for x, where x is any real number.*
In some cases, North Dakota decreased the rigor of its standards by indicating that certain standards are 'plus' standards that Wyoming includes as traditional standards.	HS.A-REI.4a: *Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)2 = q that has the same solutions. Derive the quadratic formula from this form.*	*Use the method of completing the square to transform any quadratic equation in x into an equation of the form* $(x-p)^2 = q$ *that has the same solutions.* *(+) Derive the quadratic formula from this form.*
	HS.G-CO.13: *Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.*	*(+) Apply basic constructions to create polygons such as equilateral triangles, squares, and regular hexagons inscribed in circles.*
	HS.S-ID.6b: *Informally assess the fit of a function by plotting and analyzing residuals.*	*(+) Informally assess the fit of a function by plotting and analyzing residuals.*
In a few cases, North Dakota's standards are less rigorous than those of Wyoming.	HS.N-CN.9: *Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.*	*Apply the Fundamental Theorem of Algebra to determine the number of zeros for polynomial functions. Find all solutions to a polynomial equation.*
	HS.A-SSE.3b: *Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.*	*Complete the square in a quadratic expression to produce an equivalent expression.*

NORTH DAKOTA		
	HS.A-REI.11: *Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*	*Using graphs, technology, tables, or successive approximations, show that the solution(s) to the equation f(x) = g(x) are the x-value(s) that result in the y-values of f(x) and g(x) being the same.*
Several of North Dakota's standards are less specific than those of Wyoming.	HS.A-REI.8: *Represent a system of linear equations as a single matrix equation in a vector variable.*	*Represent a system of linear equations as a single matrix equation.*
	HS.F-BF.4a: *Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠ 1.*	*Write an equation for the inverse given a function has an inverse.*
	HS.S-CP.6: *Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.*	*Find the conditional probability of A given B and interpret the answer in terms of the model.*

SOUTH DAKOTA	
Overall Finding:	Identical standards.

UTAH	
Overall Finding: Utah's 6-12 math standards are similar to those of Wyoming with a few key differences. Utah's high school standards are separated by course (Pre-calculus, Secondary Math I, II, and III). As such, some of the standards are repeated in part or in whole across the course standards. Utah added a few standards, and plus standards are included but as general standards. In addition, Utah expanded on some standards and increased the level of rigor in other standards.	
Differences:	**Examples:**
Utah does not include a standard that Wyoming includes.	S-IC.2: *Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?* S-IC.4: *Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.* Utah does not include the standards for *Using Probability to Make Decisions* (S-MD 1-7).
Utah includes additional standards.	8.NS.3: *Understand how to perform operations and simplify radicals with emphasis on square roots.* 8.EE.7c: *Solve single-variable absolute value equations.* N-CN.10: *Multiply complex numbers in polar form and use DeMoivre's Theorem to find roots of complex numbers.* N-VM.13: *Solve systems of linear equations up to three variables using matrix row reduction.* F-IF.7f: *Define a curve parametrically and draw its graph.* F-IF.10: *Use sigma notation to represent the sum of a finite arithmetic or geometric series.* F-IF.11: *Represent series algebraically, graphically, and numerically.*

UTAH		
Utah reworded or reorganized some of Wyoming's standards.	Wyoming 6.NS.1: *Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*	Utah *Interpret and compute quotients of fractions.* *a. Compute quotients of fractions by fractions, for example, by applying strategies such as visual fraction models, equations, and the relationship between multiplication and division, to represent problems.* *b. Solve real-world problems involving division of fractions by fractions. For example, how much chocolate will each person get if three people share 1/2 pound of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mile and area 1/2 square mile?* *c. Explain the meaning of quotients in fraction division problems. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.).*
	8.EE.8b: *Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.*	*Solve systems of two linear equations in two variables graphically, approximating when solutions are not integers and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.*
Some of Utah's standards are more rigorous than those of Wyoming.	6.SP.4: *Display numerical data in plots on a number line, including dot plots, histograms, and box plots.*	*Display numerical data in plots on a number line, including dot plots, histograms and box plots. <u>Choose the most appropriate graph/plot for the data collected</u>.*

UTAH		
	N-RN.3: *Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.*	*Explain why sums and products of rational numbers are rational, that the sum of a rational number and an irrational number is irrational, and that the product of a nonzero rational number and an irrational number is irrational. <u>Connect to physical situations (e.g., finding the perimeter of a square of area 2).</u>*
	A-SSE.4: *Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.*	*a. Understand the formula for the sum of a series and use the formula to solve problems.* *b. Derive the formula for the sum of an arithmetic series.* *c. Derive the formula for the sum of a geometric series, and use the formula to solve problems. Extend to infinite geometric series. For example, calculate mortgage payments.*
Utah expanded on some of Wyoming's standards.	G.CO.5: Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, for example, graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	*Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, for example, graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. <u>Point out the basis of rigid motions in geometric concepts, for example, translations move points a specified distance along a line parallel to a specified line; rotations move objects along a circular arc with a specified center through a specified angle.</u>*
Utah included some standards at multiple grade levels. In some cases, only a portion of a standard is seen in a particular set of course standards.	F-IF.7a: Graph linear and quadratic functions and show intercepts, maxima, and minima.	Secondary Mathematics I *Graph linear functions and show intercepts.* Secondary Mathematics II *Graph linear and quadratic functions and show intercepts, maxima, and minima.*

MATH STANDARDS K-5: SELECTED STATES BASED ON HIGH ACADEMIC PERFORMANCE

All standards are numbered following the conventions of Wyoming when possible.

INDIANA	
Overall Finding:	Indiana's K-5 math standards cover the same general topic areas as Wyoming, but are substantially different. Indiana structures their standards differently, does not include a large number of Wyoming's standards, includes additional standards, and rewords many standards to increase clarity and emphasize real-world problems.
Differences:	**Examples:**
Indiana includes additional standards.	K.NS.9: *Use correctly the words for comparison, including one and many; none, some, and all; more and less; most and least; and equal to, more than and less than.* K.NS.10: *Separate sets of ten or fewer objects into equal groups.* 4.G.1.: *Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge and technology).*
Indiana does not include many of Wyoming's standards.	Kindergarten K.G.3: *Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").* Grade 2 2.MD.9: *Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.* Grade 4 4.NBT.1: *Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*

INDIANA		
Many of Indiana's standards have been reworded to improve clarity and/or to emphasize real-world problems.	Wyoming 1.NBT.2: *Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:* *a. 10 can be thought of as a bundle of ten ones — called a "ten."* *b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.* *c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).*	Indiana 1.NS.2: *Understand that 10 can be thought of as a group of ten ones — called a "ten." Understand that the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. Understand that the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).*
	3.MD.1: *Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.*	3.M.3: *Tell and write time to the nearest minute from analog clocks, using a.m. and p.m., and measure time intervals in minutes. Solve real-world problems involving addition and subtraction of time intervals in minutes.*
	3.MD.2: *Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.*	3.M.1: *Estimate and measure the mass of objects in grams (g) and kilograms (kg) and the volume of objects in quarts (qt), gallons (gal), and liters (l). Add, subtract, multiply, or divide to solve one-step real-world problems involving masses or volumes that are given in the same units (e.g., by using drawings, such as a beaker with a measurement scale, to represent the problem).*

INDIANA		
Indiana expanded on some of Wyoming's standards.	1.NBT.1: *Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.* 3.MD.7.a. *Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.*	1.NS.1: *Count to at least 120 by ones, fives, and tens from any given number. In this range, read and write numerals and represent a number of objects with a written numeral.* 3.M.5: *Find the area of a rectangle with whole-number side lengths by modeling with unit squares, and show that the area is the same as would be found by multiplying the side lengths. Identify and draw rectangles with the same perimeter and different areas or with the same area and different perimeters.*
Indiana moved some standards between grade levels.	1.OA.3: *Apply properties of operations as strategies to add and subtract 3. Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*	2.CA.6: *Show that the order in which two numbers are added (commutative property) and how the numbers are grouped in addition (associative property) will not change the sum. These properties can be used to show that numbers can be added in any order.*

MASSACHUSETTS	
Overall Finding: Massachusetts' K-5 math standards are similar to those of Wyoming with three key differences. Massachusetts includes additional standards, mostly related to real-world applications such as money, time, measurement, and temperature; has standards for pre-kindergarteners; and has expanded on some of Wyoming's standards.	
Differences:	**Examples:**
Massachusetts includes additional standards.	Grade 1 MA. 5: *Identify the values of all U.S. coins and know their comparative values (e.g., a dime is of greater value than a nickel). Find equivalent values (e.g., a nickel is equivalent to 5 pennies). Use appropriate notation (e.g., 69¢). Use the values of coins in the solutions of problems.* Grade 5 MA.1: *Use positive and negative integers to describe quantities such as temperature above/below zero, elevation above/below sea level, or credit/debit.*
Massachusetts includes Pre-Kindergarten standards.	Massachusetts has Pre-K standards for the following areas: Counting and Cardinality, Operations and Algebraic Thinking, Measurement and Data, and Geometry. MA.1. *Listen to and say the names of numbers in meaningful contexts.* MA.2. *Recognize and name written numerals 0-10.* MA.3. *Understand the relationships between numerals and quantities up to ten.* MA.4. *Count many kinds of concrete objects and actions up to ten, using one-to-one correspondence, and accurately count as many as seven things in a scattered configuration.* MA.5. *Use comparative language, such as more/less than, equal to, to compare and describe collections of objects.* MA.1. *Use concrete objects to model real-world addition (putting together) and subtraction (taking away) problems up through five.*
In a few cases, Massachusetts expanded on Wyoming's standards.	Wyoming 2.MD.7: *Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.* Massachusetts MA.7.a: *Know the relationships of time, including seconds in a minute, minutes in an hour, hours in a day, days in a week, a month, and a year; and weeks in a month and a year.*

NEW HAMPSHIRE	
Overall Finding:	Identical standards.

NEW JERSEY		
Overall Finding: New Jersey's K-5 math standards are identical to those of Wyoming except for some minor wording changes.		
Differences:	**Examples:**	
New Jersey made minor wording changes to some of Wyoming's standards.	Wyoming K.OA.5. *Fluently add and subtract within 5.* 3.MD.6: *Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).*	New Jersey *Demonstrate fluency for addition and subtraction within 5.* *Measure areas by counting unit squares (square cm, square m, square in, square ft, and <u>non-standard</u> units).*

VERMONT	
Overall Finding:	Identical standards.

VIRGINIA	
Overall Finding:	Virginia's K-5 math standards are not based on Common Core State Standards and vary greatly from those of Wyoming. While both sets of standards cover similar topic areas, Virginia introduces a number of topics at earlier grade levels, incorporates additional standards, and is missing standards that Wyoming includes. Differences in rigor were observed, however, due to the lack of one-to-one correspondence in standards, rigor judgements were only made when the difference in rigor was clear and convincing.
Differences:	**Examples:**
Virginia includes additional standards.	K.3b: *Count backward orally by ones when given any number between 1 and 10.* 1.5: *The student, given a familiar problem situation involving magnitude, will* *a. select a reasonable order of magnitude from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral (e.g., 5, 50, 500); and* *b. explain the reasonableness of the choice.* 5. 16: *The student, given a practical problem, will* *a. represent data in line plots and stem-and-leaf plots;* *b. interpret data represented in line plots and stem-and-leaf plots; and* c. *compare data represented in a line plot with the same data represented in a stem-and-leaf plot.*
Virginia does not include some of Wyoming's standards.	K.CC.4: *Understand the relationship between numbers and quantities; connect counting to cardinality.* *a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.* *b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.* *c. Understand that each successive number name refers to a quantity that is one larger.* 4.MD.5: *Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:* *a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.* *b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.* 5.NBT.1: *Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.*

VIRGINIA		
Virginia introduces some concepts at earlier grade levels.	Virginia introduces fractions in Kindergarten while Wyoming does not introduce fractions until grade 3. Virginia introduces probability in Grade 3 while Wyoming does not introduce probability in K-5	
Some of Virginia's standards are less rigorous than those of Wyoming.	Wyoming 1.OA.2: *Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.* 4.G.1: *Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.*	Virginia 1.6: *The student will create and solve single-step story and picture problems using addition and subtraction within 20.* 4.10a: *The student will identify and describe points, lines, line segments, rays, and angles, including endpoints and vertices.*

MATH STANDARDS 6-12: SELECTED STATES BASED ON HIGH ACADEMIC PERFORMANCE

All standards are numbered following the conventions of Wyoming when possible.

<table>
<tr><th colspan="2">INDIANA</th></tr>
<tr><td colspan="2">Overall Finding: Indiana's 6-12 math standards generally cover the same topic areas, but are substantially different than those of Wyoming. Indiana structures their standards differently, does not include a number of Wyoming's standards, includes additional standards, and moved some standards between grade levels. Differences in rigor were observed, however, due to the lack of one-to-one correspondence in standards, rigor judgements were only made when the difference in rigor was clear and convincing.</td></tr>
<tr><td>Differences:
Indiana includes additional standards.</td><td>Examples:
6.NS.5: Know commonly used fractions halves, thirds, fourths, fifths, eighths, tenths) and their decimal and percent equivalents. Convert between any two representations (fractions, decimals, percents) of positive rational numbers without the use of a calculator.

6.C.6: Apply the order of operations and properties of operations (identity, inverse, commutative properties of addition and multiplication, associative properties of addition and multiplication, and distributive property) to evaluate numerical expressions with nonnegative rational numbers, including those using grouping symbols, such as parentheses, and involving whole number exponents. Justify each step in the process.

7.NS.2: Understand the inverse relationship between squaring and finding the square root of a perfect square integer. Find square roots of perfect square integers.

AII.F.4: Understand that if the graph of a function contains a point (a, b), then the graph of the inverse relation of the function contains the point (b, a); the inverse is a reflection over the line y = x.</td></tr>
<tr><td>Indiana does not include some of the standards Wyoming includes.</td><td>Indiana does not include all of the standards related to the standard sets Represent and model with vector quantities, and Perform operations on vectors.</td></tr>
<tr><td>In some cases, Indiana moved standards between grade levels.</td><td>Indiana's Grade 7 standard, 7.NS.3: Know there are rational and irrational numbers. Identify, compare, and order rational and common irrational numbers (√2, √3, √5, ∏) and plot them on a number line, is covered in Grade 8 in Wyoming.

Standards targeting the probability of compound events were moved from Grade 7 to Grade 8.</td></tr>
</table>

INDIANA		
In some cases, Indiana's standards are less rigorous than those of Wyoming.	Wyoming 8.G.7: *Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.*	Indiana 8.GM.8: *Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and other mathematical problems in two dimensions.*
	8.G.6: *Explain a proof of the Pythagorean Theorem and its converse.*	8.GM.7: *Use inductive reasoning to explain the Pythagorean relationship.*
In some cases, Indiana's standards are more rigorous than those of Wyoming.	S-ID.1: *Represent data with plots on the real number line (dot plots, histograms, and box plots).*	PS.DA.1: *Create, compare, and evaluate different graphic displays of the same data, using histograms, frequency polygons, cumulative frequency distribution functions, pie charts, scatterplots, stem-and-leaf plots, and box-and whisker plots. Draw these with and without technology.*
	S-IC.6: *Evaluate reports based on data.*	PS.DA.12: *Evaluate reports based on data by considering the source of the data, the design of the study, the way the data are analyzed and displayed, and whether the report confuses correlation with causation. Distinguish between correlation and causation.*

MASSACHUSETTS	
Overall Finding: Massachusetts' 6-12 math standards are similar to those of Wyoming and include additional standards.	
Differences: Massachusetts includes additional standards.	**Examples:** MA.7. *Solve real-world and mathematical problems involving the surface area of spheres.* MA.10. *Given algebraic, numeric, and/or graphical representations of functions, recognize the function as polynomial, rational, logarithmic, exponential, or trigonometric.*

NEW HAMPSHIRE	
Overall Finding:	Identical standards.

NEW JERSEY		
Overall Finding: New Jersey's 6-12 math standards are identical to those of Wyoming except for some minor wording changes.		
Differences:	**Examples:**	
New Jersey made minor wording changes to some of Wyoming's standards.	Wyoming 7-NS.1a. *Describe situations in which opposite quantities combine to make 0.* *<u>For example, a hydrogen atom has 0 charges because its two constituents are oppositely charged.</u>*	New Jersey *Describe situations in which opposite quantities combine to make 0.* *<u>For example, in the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points. What is her score at the end of the second round?</u>*
	A-APR.4: *Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity* $(x^2 + y^2)^2 = (x^2 - y^2) + (2xy)^2$ *can be used to generate Pythagorean triples.*	*Prove polynomial identities and use them to describe numerical relationships. For example,* *<u>the difference of two squares; the sum and difference of two cubes;</u>* *the polynomial identity* $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ *can be used to generate Pythagorean triples.*

VERMONT	
Overall Finding:	Identical standards.

VIRGINIA	
Overall Finding:	Virginia's 6-12 standards are not based on Common Core State Standards and vary greatly from Wyoming. While both sets of standards cover similar topic areas, Virginia incorporates additional standards, and is missing standards that Wyoming includes. Differences in rigor were observed, however, due to the lack of one-to-one correspondence in standards, rigor judgements were only made when the difference in rigor was clear and convincing.
Differences:	**Examples:**
Virginia includes additional standards.	Virginia includes additional standards targeting computer mathematics and discrete mathematics. COM.2: *The student will design, write, document, test, and debug a computer program.* COM.16: *The student will describe the way the computer stores, accesses, and processes variables, including the following topics: the use of variables versus constants, parameter passing, scope of variables, and local versus global variables.* DM.3: *The student will apply graphs to conflict-resolution problems, such as map coloring, scheduling, matching, and optimization.* DM.6: *The student will investigate and describe weighted voting and the results of various election methods. These may include approval and preference voting as well as plurality, majority, runoff, sequential runoff, Borda count, and Condorcet winners*
Virginia is missing some of the standards that Wyoming includes.	7.RP.2: *c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* *d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.* F-BF.4: *Find inverse functions.* *a. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠ 1.* *b. (+) Verify by composition that one function is the inverse of another.* *c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.* d. *(+) Produce an invertible function from a non-invertible function by restricting the domain.*

VIRGINIA		
Some of Virginia's standards are less rigorous than those of Wyoming.	Wyoming S-CP.9: (+) *Use permutations and combinations to compute probabilities of compound events and solve problems.* Wyoming standards concerning triangle proofs: G-CO: *Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.* G-SRT4: *Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.* GSRT5: *Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.*	Virginia PS.9: *The student will plan and conduct a survey. The plan will address sampling techniques and methods to reduce bias.* Virginia standards concerning triangle proofs: G.6: *The student, given information in the form of a figure or statement, will prove two triangles are congruent.* G.7: *The student, given information in the form of a figure or statement, will prove two triangles are similar.*
Some of Virginia's standards are more rigorous than those of Wyoming.	S-ID.1: *Represent data with plots on the real number line (dot plots, histograms, and box plots).* S-IC.3: *Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.*	PS.1: *The student will analyze graphical displays of univariate data, including dotplots, stemplots, boxplots, cumulative frequency graphs, and histograms, to identify and describe patterns and departures from patterns, using central tendency, spread, clusters, gaps, and outliers.* PS.10: *The student will plan and conduct a well-designed experiment. The plan will address control, randomization, replication, blinding, and measurement of experimental error.*

Appendix D

Science Standards

SCIENCE STANDARDS K-5: STATES IN THE REGION

All standards are numbered following the conventions of Wyoming when possible.

<table>
<tr><th colspan="3">COLORADO</th></tr>
<tr><td colspan="3">Overall Finding: Colorado's K-5 science standards are more specific but focus on the same key areas as Wyoming's standards: physical science, life science, and earth science. Some additional (or more specific) concepts are included in Colorado's standards and some standards Wyoming has do not appear in the Colorado standards. Additionally, some standards are seen at different grade levels.</td></tr>
<tr><td>Differences:
Some of Colorado's standards more specific or have additional concepts than those of Wyoming.</td><td>Examples:
Wyoming
2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.</td><td>
Colorado
Solids and liquids have unique properties that distinguish them.
a. Analyze and interpret observations about solids and liquids and their unique properties.
b. Identify the similarities and differences of two or more groups of solids or liquids.
c. Classify solids and liquids based on their properties, and justify your choice based on evidence.</td></tr>
<tr><td>Some of Wyoming's standards are not included or are at different grade levels for Colorado.</td><td colspan="2">Waves are not discussed at the primary grade levels.
Concepts central to standard K-PS2-2 (motion and stability) are targeted in second grade.</td></tr>
</table>

IDAHO	
Overall Finding: Idaho's K-5 science standards are similar to those of Wyoming. Idaho includes an additional standard, increases specificity on some standards, and has moved some standards between grade levels.	
Differences:	**Examples:**
Some of Idaho's standards are more specific than those of Wyoming.	K-ESS2-1: *Use and share observations of local weather conditions to describe patterns over time, <u>which includes the 4 seasons.</u>* K-ESS3-3: *Communicate solutions that will <u>reduce</u> the impact of humans on the land, water, air, and/or other living things in the local environment*.
Idaho moved some standards between grade levels.	Wyoming standard moved from Grade 3 to Grade 1 in Idaho: 3-LS1-1: *Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.* Wyoming standards moved from Grade 3 to Grade 5 in Idaho: 3-LS4-1: *Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.* 3-LS4-2: *Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.* 3-LS4-3: *Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all*. 3-LS4-4: *Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.* Wyoming standard moved from Grade 5 to Grade 4 in Idaho: 5-LS2-1: *Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.*
Idaho includes an additional standard.	K-LS1-2: *Use classification supported by evidence to differentiate between living and non-living items.*
Idaho modified some standards.	Engineering, Technology, and Applications of Science standards are included as supporting content for each set of standards (when applicable). The language is modified for congruence. Kindergarten Physical Sciences: Motion and Stability: Forces and Interactions: ETS1.A: *Defining Engineering Problems: A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems have many acceptable solutions.* Grade 4: Physical Sciences: Waves: ETS1.C: *Optimizing the Design Solution: Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and constraints.*

<table>
<tr><th colspan="2">MONTANA</th></tr>
<tr><td colspan="2">Overall Finding: Three key differences were found between Wyoming’s and Montana’s K-5 science standards. Montana (1) places an increased emphasis on critical thinking, (2) includes content that pertains to American Indians, and (3) does not include some of the same standards as Wyoming.</td></tr>
<tr><td>Differences:
Montana places an increased emphasis on critical thinking.</td><td>Examples:
Wyoming | Montana
K-PS3-1: Make observations to determine the effect of sunlight on Earth’s surface. | Construct an explanation based on observations of the effect of sunlight on Earth’s surface.

2-ESS2-1: Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. | Construct explanations to compare multiple physical and naturally built designs which impact wind or water’s effect on the shape of the land.

5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. | Develop and critique a model to describe the movement of matter among plants, animals, decomposers, and the environment.</td></tr>
<tr><td>Montana includes content relevant to American Indians.</td><td>Many of the standards for Montana explicitly direct teachers to include content relevant to American Indians.
a. 5-ESS1-2: Graph the daily changes in the length, shape, and direction of shadows; lengths of day and night; and the seasonal appearance of select stars to communicate the patterns of the Earth’s movement <u>and describe how astronomical knowledge is used by American Indians.</u>
b. 5-ESS3-1: Obtain and combine information from various sources about ways individual communities use science ideas to protect the Earth’s resources, environment, and systems <u>and describe examples of how American Indians use scientific knowledge and practices to maintain relationships with the natural world.</u></td></tr>
<tr><td>Montana does not include some of Wyoming’s standards.</td><td>Montana does not include any of the Engineering, Technology, and Applications to Science standards that Wyoming includes.</td></tr>
</table>

NEBRASKA	
Overall Finding: Nebraska's K-5 science standards are similar to those of Wyoming but do not include all of the Engineering, Technology, and Applications to Science standards and includes one additional standard.	
Differences:	**Examples:**
Nebraska includes an additional standard.	SC.5.13.3D: *Define a simple design problem that can be solved by applying scientific ideas about the conservation of water.*
Nebraska does not include many of Wyoming's Engineering, Technology, and Applications to Science standards.	Nebraska does not include all of the Engineering, Technology, and Applications to Science standards that Wyoming includes. Missing standards: Kindergarten: K-2-ETS1-2, K-2-ETS1-3. First Grade: K-2-ETS1-1, K-2-ETS1-3. Second Grade: All. Third Grade: All. Fourth Grade: 3-5-ETS1-1, 3-5-ETS1-2. Fifth Grade: 3-5-ETS1-2, 3-5-ETS1-3.

NORTH DAKOTA	
Overall Finding:	North Dakota's K-5 science standards were not reviewed as the standards have not been updated since 2006 and documentation on the North Dakota website (https://www.nd.gov/dpi/uploads/93/ScienceStandardsStatusFinalDraftNov252015.pdf) suggest that the state plans to revise the standards.

SOUTH DAKOTA	
Overall Finding: South Dakota's K-5 science standards are similar to those of Wyoming but do not include the Engineering, Technology, and Applications to Science standards.	
Differences: Standards not included by South Dakota.	**Examples:** South Dakota does not include Wyoming's Engineering, Technology, and Applications to Science standards.

<table>
<tr><th colspan="3">UTAH</th></tr>
<tr><td colspan="3">Overall Finding: Utah’s K-5 science standards cover the same areas (earth and space science, life science, and physical science) as Wyoming, however Utah’s standards are less rigorous in some areas. In addition, Utah’s standards are structured differently (broken down into smaller objectives), and appear at different grade levels. Utah also includes some standards specific to the state.</td></tr>
<tr><td>Differences:
Some of Utah’s standards are less rigorous than those of Wyoming.</td><td>Examples:
Wyoming
Physical Science Grade 2
2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
2-PS1-3: Make observations to construct an evidence based account of how an object made of a small set of pieces can be disassembled and made into a new object.
2-PS1-4: Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.</td><td>
Utah
Physical Science Grade 2
• Communicate observations about falling objects.
• Observe falling objects and identify things that prevent them from reaching the ground.
• Communicate observations that similar objects of varying masses fall at the same rate.
• Compare and contrast the differences in how different materials respond to change.
• Model physical changes of various materials.
• Investigate and provide evidence that matter is not destroyed or created through changes.</td></tr>
<tr><td>Inclusion of Utah specific standards.</td><td colspan="2">Grade 4 standards:
Use a simple scheme to classify Utah’s plants and animals.
Describe the physical characteristics of Utah’s wetlands, forests, and deserts.
Students will understand how fossils are formed, where they may be found in Utah, and how they can be used to make inferences.</td></tr>
</table>

SCIENCE STANDARDS 6-12: STATES IN THE REGION

All standards are numbered following the conventions of Wyoming when possible.

<table>
<tr><th colspan="2">COLORADO</th></tr>
<tr><td colspan="2">Overall Finding: Colorado's 6-12 science standards are more specific but focus on the same key areas as Wyoming's standards: physical science, life science, and Earth science. Some additional (or more specific) concepts are included in Colorado's standards and some are missing. Additionally, Colorado provides different standards for students at Grades 6-8 instead of simply middle school standards, and some standards are seen at different grade levels.</td></tr>
<tr><td>Differences:
Some of Colorado's standards more specific or have additional concepts than those of Wyoming.</td><td>Examples:
The high school standards that apply to Newtonian Physics are expanded (HS-PS2-1-4):
• Gather, analyze and interpret data and create graphs regarding position, velocity and acceleration of moving objects.
• Develop, communicate and justify an evidence-based analysis of the forces acting on an object and the resultant acceleration produced by a net force.
• Develop, communicate and justify an evidence-based scientific prediction regarding the effects of the action-reaction force pairs on the motion of two interacting objects.
• Examine the effect of changing masses and distance when applying Newton's law of universal gravitation to a system of two bodies.
• Identify the limitations of Newton's laws in extreme situations.</td></tr>
<tr><td>Colorado does not include some of Wyoming's standards.</td><td>Colorado's standards make no reference to electric or magnetic fields.</td></tr>
</table>

IDAHO	
Overall Finding: Idaho's 6-12 standards are similar to those of Wyoming. Idaho includes additional standards, modified standards, and is missing some of the standards that Wyoming includes.	
Differences: Idaho has modified the language of one of the standards but maintained approximately the same level of rigor.	**Example:** Wyoming: MS-LS1-2: *Develop and use models to describe the parts, functions, and basic process of cells.* Idaho: *Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.* Engineering, Technology, and Applications of Science standards are included as supporting content for each set of standards (when applicable). The language is modified for congruence. Middle School Energy: ETS1.B: Developing Possible Solutions: *A solution needs to be tested, and then modified on the basis of the test results in order to improve it. There are systematic processes for evaluation solutions with respect to how well they meet criteria and constraints of a problem.*
Idaho includes additional standards.	MS-LS1-4: *Construct a scientific argument based on evidence to defend a claim of life for a specific object or organism.* MS-LS4-3: *Analyze displays of pictorial data to compare patterns of similarities in the anatomical structures across multiple species of similar classification levels to identify relationships.*[1] MS-PS1-1: *Develop models to describe the atomic composition of simple molecules and extended structures.* Is included for both middle and high school. HS-PSP3-4: *Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.*
Idaho does not include some of Wyoming's standards.	MS-LS1-4: *Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.* MS-LS1-5: *Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.* MS-ESS3-5: *Ask questions to clarify evidence of the factors that have caused changes in global temperatures over time.* MS-LS1-8: *Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.*

[1] The exclusion of this standard from Wyoming is intentional.

<table>
<tr><th colspan="2">MONTANA</th></tr>
<tr><td colspan="2">Overall Finding: Three key differences were found between Wyoming's and Montana's 6-12 science standards. Montana (1) places an increased emphasis on critical thinking, (2) includes content that pertains to American Indians, and (3) does not include some of the same standards as Wyoming and includes some additional standards.</td></tr>
<tr><td>Differences:
Montana's standards have an increased emphasis on critical thinking.</td><td>Example:
Wyoming
MS-PS1-5: Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
Montana
Develop, use, and critique a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

Wyoming
HS-LS4-1: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
Montana
Evaluate and communicate scientific information about how common ancestry and biological evolution are supported by multiple lines of empirical evidence.</td></tr>
<tr><td>Montana has merged two of Wyoming's standards into a single standard.</td><td>Wyoming 1
Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
Wyoming 2
Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
Montana
Use mathematical or computational representations to support arguments about environmental factors that affect carrying capacity, biodiversity, and populations in ecosystems.</td></tr>
<tr><td>Montana includes content relevant to American Indians.</td><td>HS-LS2-7: Design, evaluate, and refine a solution for reducing the direct and indirect impacts of human activities on the environment and biodiversity and <u>analyze scientific concepts used by American Indians to maintain healthy relationships with environmental resources</u>
HS-LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in:
• changes in the number of individuals of some species.
• the emergence of new species over time.
• the extinction of other species.
• <u>investigate and explain American Indian perspectives on changes in environmental conditions and their impacts.</u></td></tr>
</table>

MONTANA	
Montana includes additional standards.	• *Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy*[2] (6-8 Life Science). • *Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter* (9-12 Physical Science).
Montana does not include some of Wyoming's standards.	Montana does not include any of the Engineering, Technology, and Applications to Science standards that Wyoming includes. MS-LS1-8: *Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.* MS-PS4-3: *Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit signals than analog signals.* HS-LS2-8: *Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce.*

[2] The exclusion of this standard from Wyoming is intentional.

NEBRASKA	
Overall Finding: Nebraska's 6-12 science standards are similar to those of Wyoming but do not include all of the Engineering, Technology, and Applications to Science standards. Nebraska also reorganized their standards to be grade level specific up to Grade 8.	
Differences:	**Examples:**
Nebraska includes additional standards.	SC.HS.2.2.C: *Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.* SC.HS.13.3.C: *Construct an argument based on evidence to explain the multiple processes that cause Earth's plates to move.* Additional Plus[3] standards in physics, chemistry, biology, anatomy and physiology.
Nebraska does not include two of Wyoming's Engineering, Technology, and Applications to Science standards.	MS-ETS2-1. MS-ETS2-2.

[3] Plus standards represent advanced science topics designed to enhance the rigor of general science curricula or supplement additional advanced science courses. For more information see https://www.education.ne.gov/science/2016%20Standards/Nebraska_Science_Standards_DRAFT_8_3_2017.pdf

NORTH DAKOTA	
Overall Finding:	North Dakota's 6-12 science standards were not reviewed as the standards have not been updated since 2006 and documentation on the North Dakota website (https://www.nd.gov/dpi/uploads/93/ScienceStandardsStatusFinalDraftNov252015.pdf) suggest that the state plans to revise the standards.

<table>
<tr><th colspan="3">SOUTH DAKOTA</th></tr>
<tr><td colspan="3">Overall Finding: South Dakota’s 6-12 science standards are similar but do not include the Engineering, Technology, and Applications to Science standards along with a few other standards. South Dakota added two standards and increased the rigor on a few standards</td></tr>
<tr><td>Differences:</td><td colspan="2">Examples:</td></tr>
<tr><td>Some of South Dakota’s standards are more rigorous than those of Wyoming.</td><td>Wyoming
MS-PS1-3: Gather and make sense of information to describe that synthetic material comes from natural resources and impact society.
MS-PS-5: Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
MS-PS4-3: Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
MS-LS4-5: Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.</td><td>South Dakota
Obtain and evaluate information to describe that synthetic material comes from natural resources and impact society.
Engage in argument from evidence to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
Obtain, evaluate, and communicate information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
Obtain, evaluate, and communicate information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.</td></tr>
<tr><td>South Dakota includes additional standards.</td><td colspan="2">HS-PS4-4: Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.
HS-LS4-7: Analyze displays of pictorial data to compare patterns of similarities in the anatomical structures across multiple species of similar classification levels to identify relationships.[4]</td></tr>
<tr><td>South Dakota does not include some of Wyoming’s standards.</td><td colspan="2">MS-LS1-8: Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
MS-ESS1-4: Construct a scientific explanation based on evidence from rocks and rock strata for how geologic time scale is used to organize Earth’s 4.6-billion-year-old history.
HS-ESS2-1: Develop a model to illustrate how Earth’s internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.
HS-ESS2-6: Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
HS-ESS2-7: Construct an argument based on evidence about the simultaneous coevolution of Earth’s systems and life on Earth.</td></tr>
</table>

[4] The exclusion of this standard from Wyoming is intentional.

<table>
<tr><th colspan="3">UTAH</th></tr>
<tr><td colspan="3">Overall Finding: Utah’s 6-12 science standards cover the same general areas as Wyoming. The standards used in Utah are more expansive, due to the breakdown of standards into smaller objectives, however much of the specificity is either encompassed in Wyoming’s standards or covered in additional information included with the standards. There is also some movement of topic areas between grade levels.</td></tr>
<tr><td>Differences:
Many of Utah’s standards are more expansive than those of Wyoming.</td><td>Examples:
Wyoming
Example from life science Grade 7.
MS-LS1-2: Develop and use models to describe the parts, functions, and basic processes of cells.</td><td>
Utah
Example from life science Grade 7.[5]
Objective 1: Observe and describe cellular structures and functions.
a. Use appropriate instruments to observe, describe, and compare various types of cells (e.g., onion, diatoms).
b. Observe and distinguish the cell wall, cell membrane, nucleus, chloroplast, and cytoplasm of cells.
c. Differentiate between plant and animal cells based on cell wall and cell membrane.</td></tr>
</table>

[5] These topics are not covered in Grades 6 or 8 in Utah.

INDIANA		
Overall Finding: Indiana's K-5 standards are largely aligned with Wyoming's and focus on the same key areas: physical science, earth and space science, life science. Engineering is included and is similar to the Wyoming Engineering, Technology, and Application of Science ETS1 standards. Some of the Disciplinary Core Ideas included in Indiana differ from those seen in Wyoming and standards reflect this difference. In addition, Indiana made changes to the learning progressions in science. Standards were moved between grade levels and standards were added[1] to articulate with both lower and higher grade levels.		
Differences:	**Examples:**	
	Wyoming	Indiana
Two of Indiana's standards are more expansive than those of Wyoming.	4-ESS3-2: *Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*	*Develop solutions that could be implemented to <u>reduce the impact of humans on the natural environment</u> and the natural environment on humans.* (IN 4.ESS.4)
	4-LS1-1: *Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.*	*Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction <u>in different ecosystems</u>.*
Indiana combines two Wyoming standards into one standard.	Indiana standard K.ESS.1: *Make observations to determine the effect of sunlight on Earth's surface and use tools and materials to design and build a structure to reduce the warming effect on Earth's surface,* combines WY K-PS3-1 and K-PS3-2.	
Indiana added some standards at earlier grade levels to scaffold into Disciplinary Core Ideas found at later grade levels.	Kindergarten: K.PS.1, K.PS.2, K.ESS.2., K.LS.1, K.LS.2. K.PS.1. *Plan and conduct an investigation using all senses to describe and classify different kinds of objects by their composition and physical properties. Explain these choices to others and generate questions about the objects.* This leads into WY Second Grade standard 2-PS1-1, *Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.*	
Indiana includes a few additional standards at higher grade levels to articulate with those at lower grade levels.	1.ESS.4: *Develop solutions that could be implemented to reduce the impact of humans on the land, water, air, and/or other living things in the local environment.* This aligns with K.ESS.4: *Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment*, which aligns with WY standard K-ESS3-3.	

[1] Standard codes included here align with Indiana's standards.

INDIANA	
	2.ESS.2: *Investigate the severe weather of the region and its impacts on the community, looking at forecasting to prepare for, and respond to severe weather.* This aligns with K.ESS.3: *Investigate the local weather conditions to describe patterns over time*, which aligns with WY standard K-ESS-2-1.
Indiana moved some standards/concepts from higher grade levels to lower grade levels.	Standard moved from Grade 3 to Grade 1: WY 3-LS-1-1: *Develop models to describe that organisms have unique and diverse life cycles but all have common birth, growth, reproduction, and death.* (Same wording as IN 1.LS.1) Standard/concept moved from Grade 5 to Grade 2: WY 5-PS1-4: *Conduct an investigation to determine whether the mixing of two or more substances results in new substances.* Similar concept as IN 2.PS.2: *Predict the results of combining solids and liquids in pairs. Mix, observe, gather, record, and discuss evidence of whether the results may have different properties than the original materials*. Standard moved from Middle School to Grade 5: WY MS-ESS1-3: *Analyze and interpret data to determine scale properties of objects in the solar system.* IN 5.ESS.1: *Analyze the scale of our solar system and its components* (examples are provided).
Indiana moved some standards from lower grade levels to higher grade levels.	Wyoming standard moved from Grade K to Grade 1 in Indiana: IN 1.LS.4: *Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.* (WY K-ESS3-1) Wyoming standard moved from Grade 3 to Grade 4 in Indiana: IN 4.LS.2: *Use evidence to support the explanation that a change in the environment may result in a plant or animal will survive and reproduce, move to a new location or die.* (WY 3-LS4-4's DCI covers this) Wyoming standard moved from Grade 4 to Grade 5 in Indiana: IN 5.LS.3: *Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to information in different ways.* (WY 4-LS1-2)

INDIANA	
Indiana does not include a large number of standards that are included in Wyoming's standards (*N* = 31). However, the overall number of K-5 standards included is roughly equivalent for each state.	Kindergarten: K-ESS2-2, K-ESS3-2. First Grade: 1-PS4-3, 1-PS4-4, 1-LS1-2, 1-LS3-1, 1-ESS1-2. Second Grade: 2-PS1-3, 2-LS2-1, 2-LS2-2, 2-ESS1-1, 2-ESS2-2. Third Grade: 3-LS3-2, 3LS4-2, 3-LS4-3, 3-LS4-4, 3-ESS2-2. Fourth Grade: 4-PS3-3, 4-PS4-1, 4-PS4-2, 4-PS4-3, 4-ESS1-1, 4-ESS2-1, 4-ESS2-2. Fifth Grade: 5-PS1-1, 5-PS1-2, 5-PS2-1, 5-PS3-1, 5-LS1-1, 5-ESS1-1, 5-ESS2-2.
Indiana includes two additional standards.	5.PS.4: *Describe the difference between weight being dependent on gravity and mass comprised of the amount of matter in a given substance or material.* 5.LS.2: *Observe and classify common Indiana organisms as producers, consumers, decomposers, or predator or prey based on their relationships with other organisms in their ecosystem.*
Indiana has different DCIs at some grade levels than Wyoming.	In Indiana, Grade 2 Life Science covers the DCIs of Inheritance of Traits, Variation of Traits, Structure and Function and Growth and Development. Inheritance of Traits is found in Wyoming at Grades K and 3, while Variation of Traits is found at high school. Wyoming focuses on Interdependent Relationships in Ecosystems and Biodiversity and Humans at Grade 2. In Indiana, some of the Grade 3 Physical Science standards cover Definitions of Energy which is found in Wyoming's standards at Grade 4. Indiana focuses specifically on sound energy and properties of sound in 3.PS.3 and 3.PS.4. Wyoming focuses on movement of objects and energy transfer in Grade 4.

<table>
<tr><th colspan="3">MASSACHUSETTS</th></tr>
<tr><td colspan="3">Overall Finding: Massachusetts' K-5 science standards are similar to those of Wyoming. Massachusetts does not include some of Wyoming's standards at certain grade levels, and moved some of the ETS standards to other grade levels. However, Massachusetts added nine standards, including some additional ETS standards and expanded on a number of Wyoming's standards. Changes in specificity and rigor were also observed. Additionally, Massachusetts includes science standards for Pre-Kindergarten.</td></tr>
<tr><td>Differences:</td><td colspan="2">Examples:</td></tr>
<tr><td></td><td>Wyoming</td><td>Massachusetts</td></tr>
<tr><td>Some of Massachusetts' standards are less rigorous than those of Wyoming.</td><td>K-PS2-1: <u>Plan and conduct an investigation to</u> compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. (The addition of planning and conducting also in several standards for physical science in Grades 1, 2.)</td><td>Compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.</td></tr>
<tr><td></td><td>K-ESS3-2: <u>Ask questions</u> to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.</td><td>Obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.</td></tr>
<tr><td></td><td>5-PS1-1: <u>Develop</u> a model to describe that matter is made of particles too small to be seem.</td><td><u>Use</u> a particle model of matter to explain common phenomena involving gases, and phase changes between gas and liquid and between liquid and solid.</td></tr>
<tr><td>Some of Massachusetts' standards are more rigorous than those of Wyoming.</td><td>1-ESS1-2: Make observations at different times of the year to relate the amount of daylight to the time of year.</td><td><u>Analyze</u> provided data to identify relationships among seasonal patterns of change, including relative sunrise and sunset time changes, seasonal temperature and rainfall or snowfall patterns, and seasonal changes in the environment. (Also a more expansive standard.)</td></tr>
<tr><td></td><td>4.3-5-ETS1-3: Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</td><td>Plan and carry out tests of one or more design features of a given model or prototype in which variables are controlled and failure points are considered to identify which features need to be improved. <u>Apply the results of tests to redesign a model or prototype</u>.</td></tr>
</table>

MASSACHUSETTS		
A few of Massachusetts' standards are more specific than those of Wyoming.	K-LS-1: *Use observations to describe patterns of what plants and animals (including humans) need to survive.*	*Observe and communicate that animals (including humans) and plants <u>need food, water, and air to survive. Animals get food from plants or other animals. Plants make their own food and need light to live and grow.</u>*
	Generate and compare multiple solutions that use patterns to transfer information.	*Develop and compare multiple ways to transfer information <u>through encoding, sending and receiving, and decoding a pattern.</u>*
A small number of Massachusetts' standards are less specific than those of Wyoming.	K-ESS2-2: C*onstruct an argument supported by evidence of how plants and animals (including humans) can change the environment <u>to meet their needs.</u>*	*Construct an argument supported by evidence of how plants and animals (including humans) can change the environment.*
	K-ESS3-3: *Communicate solutions that <u>will manage the impact of humans on the land, water, air, and/or other living things in the local environment</u>.*	*Communicate solutions to reduce the amount of natural resources an individual uses.*
Massachusetts expands on some of Wyoming's standards.	1-LS-1: *Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.*	*Use evidence to explain that* *a. different animals use their body parts and senses in different ways to see, hear, grasp objects, protect themselves, move from place to place, and see, find, and take in food, water, and air, and* *b. plants have roots, stems, leaves, flowers, and fruits that are used to take in water, air, and other nutrients, and produce food for the plant.*
	5-ESS3-1: *Obtain and combine information about ways individual communities use science ideas to conserve Earth's resources and environment.*	*Obtain and combine information about ways communities reduce human impact on the Earth's resources and environment <u>by changing an agricultural, industrial, or community practice or process</u>.*

MASSACHUSETTS	
A small number of Massachusetts' standards have a different scope than the corresponding standard from Wyoming.	5-LS-1: *<u>Support an argument</u> that plants get the materials they need for growth primarily from air and water.* *<u>Ask testable questions</u> about the processes by which plants use air, water, and energy from sunlight to produce sugars and plant materials needed for growth and reproduction.*
Massachusetts includes additional standards.	2-LS2-3: *Develop and use models to compare how plants and animals depend on their surroundings and other living things to meet their needs in the places they live.* 2-PS3-1: *Design and conduct an experiment to show the effects of friction on the relative temperature and speed of objects that rub against each other*. 3-LS4-5: *Provide evidence to support a claim that the survival of a population is dependent upon reproduction.* 3.3-5-ETS1-4: *Gather information using various informational resources on possible solutions to a design problem. Present different representations of a design solution.* 4.3-5-ETS1-5: *Evaluate relevant design features that must be considered in building a model or prototype of a solution to a given design problem.* 5-LS2-2: *Compare at least two designs for a composter to determine which is most likely to encourage decomposition of materials.* 5-ESS3-2: *Test a simple system designed to filter particulates out of water and propose one change of the design to improve it*. 5.3-5-ETS3-1: *Use informational texts to provide examples of improvements to existing technologies (innovations) and the development of new technologies (inventions). Recognize that technology is any modification of the natural or designed world done to fulfill human needs or wants.* 5.3-5-ETS3-2: *Use sketches or drawings to show how each part of a product or device relates to other parts in the product or device.*
Massachusetts moved some standards to lower grade levels.	Massachusetts included PS1: *Matter and Its Interactions at K.* Wyoming begins this at Grade 2. Massachusetts has LS-1-2: *Recognize that all plants and animals grow and change over time* beginning at K. Wyoming begins this at Grade 2.
Massachusetts includes standards for Pre-Kindergarten.	Massachusetts includes standards for Pre-K earth sciences (ESS1, ESS2, ESS3), life sciences (LS1, LS2, LS3), and physical sciences (PS1, PS2, and PS3).

MASSACHUSETTS	
Massachusetts does not include some of Wyoming's standards at certain grade levels and moved some ETS standards to different grade levels.	Kindergarten: K-PS2-2, K-ESS3-1, ETS (Engineering, Technology, and Applications of Science). First Grade: 1-PS4-2, K-2-ETS1-3 (this is found in Second Grade). Second Grade: 2-LS2-2, 2-ESS1-1, 2-ESS2-4, K-2-ETS1-1 and K-2-ETS1-2 (these are found in First Grade). Third Grade: 3-PS2-2, 3-LS2-1, 3-5-ETS1-3 (this is found in Fourth Grade). Fourth Grade: 4-LS1-2, 3-5 ETS1-1 and 3-5ETS1-2 (these are found in Third Grade). Fifth Grade: 3-5 ETS1-1, 3-5 ETS1-2, 3-5 ETS1-3 (these are found in Third and Fourth Grade).

NEW HAMPSHIRE	
Overall Finding:	Identical standards.

NEW JERSEY	
Overall Finding:	Identical standards.

VERMONT	
Overall Finding:	Identical standards.

VIRGINIA		
Overall Finding: Virginia's Science Standards of Learning (SOL) were adopted in 2010, prior to the release of the National Research Council's (NRC) 2011 framework and the Next Generation Science Standards (NGSS). Wyoming's standards are more focused on precursors for scientific method and show greater alignment to NGSS and NRC. Overall, Wyoming K-5 standards are more rigorous and more specific than Virginia, and involve more investigation and problem solving. Virginia has general scientific investigations, reasoning, and logic with other processes that are not applied to a specific content. Virginia has some standards that are not in Wyoming such as in Grade 2, understanding natural and artificial magnets, and understanding that living things are part of a system. In Grade 3, the standards are very different with Virginia focusing on organisms in aquatic and terrestrial food chains and investigating and understanding the major components of soil, its origin, and its importance to plants and animals including humans. In Grade 4, there is little overlap between Virginia and Wyoming, with Virginia having standards that investigate relationships between earth, moon and sun; prediction of weather conditions, organization of the solar system, plant anatomy, and analysis of Virginia resources. In Grade 5, Virginia focuses on understanding characteristics of the ocean environment, characteristics of visible light and how it behaves, and understanding how the Earth's surface is constantly changing.		
Differences:	**Examples:** Wyoming	Virginia
For Kindergarten, nearly all Virginia's standards are less specific and expansive than those of Wyoming. In addition, many of Virginia's standards are also less rigorous.	WY K-ESS3-3: *Communicate solutions that will manage the impact of humans on the land, water, air, and/or other living things in the environment.*	VA K.11: *The students will investigate and understand that materials can be reused, recycled, and conserved.*
Virginia has several standards that are more specific than those of Wyoming.	WY 2-PS-1: *Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.*	VA 2.1: *The students will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which:* *a. observations are made and questions are formed;* *b. observations are differentiated from personal interpretation;* *c. observations are repeated to ensure accuracy;* *d. two or more characteristics are used to classify items. (There are 10 more tasks included).*

VIRGINIA		
Virginia has several standards that are more expansive than those of Wyoming.	WY KLS1-1: *Use observations to describe patterns of what animals (including humans) need to survive.*	VA K.7: *The students will investigate and understand basic needs and life processes of plants and animals. Key concepts include:* *a. animals need adequate food, water, shelter, air, and space to survive;* *b. plants needs nutrients, water, air, light, and a place to grow and survive;* *c. plants and animals change as they grow, having varied life cycle, and eventually die; and* *d. offspring of plants and animals are similar but not identical to their parents or to one another.*
Several of Virginia's standards are less expansive than those of Wyoming.	WY 4-PS3-2: *Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.*	VA 4.3: *The student will investigate and understand the characteristics of electricity.*
Many of Virginia's standards are less rigorous, and in many cases less specific, than those of Wyoming.	WY K.ESS3-1: <u>*Use a model*</u> *to represent the relationship between the needs of different plants and animals (including humans) and the places they live.*	VA K.7: *The student will investigate and understand the basic needs and life processes of plants and animals.*
	WY K-2-ETS1-1. *Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.*	VA K.9: *The student will investigate and understand that there are simple repeating patterns in his/her daily life.*
	WY 4-ESS2-1: *Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.*	VA 4.6: *The student will investigate and understand how weather conditions and phenomena can occur and can be predicted.*

VIRGINIA		
Virginia has more expansive, less specific approaches to data analysis than Wyoming.	WY K-2-ETS1-3: *Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each perform.*	Virginia focuses on recording observations, constructing picture graphs, recognizing unexpected results, describing objects pictorially and verbally.
Virginia does not include a large number (*N* = 50) of Wyoming's standards.	WY K-2-ETS1-2: *Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.* WY 1-PS4-1: *Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.* Virginia does not have standards that address waves. Water ("matter") is addressed by examining how different materials interact with it. WY 1-PS4-2: *Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.* Virginia has no standards on "darkness" – just more general relationship between sun and Earth. WY 1-PS4-3: *Plan and conduct investigations to determine the effects of placing objects made with different materials in the path of a beam of light.* Others: First Grade: 1-PS4-4, K-2-ETS1-3. Second Grade: 2-LS4-1, 2-ESS1-1, 2-ESS2-2, 2-ESS2-3, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3. Third Grade: 3-PS2-1, 3-PS2-2, 2-PS2-4, 3-LS3-1, 3-LS3-2, 3-LS4-1, 3-LS4-2, 3-LS4-4, 3-ESS2-1, 3-ESS2-1, 3-ESS3-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3. Fourth Grade: 4-PS3-4, 4-PS4-1, 4-PS4-2, 4-PS4-3, 4-LS1-2, 4-ESS1-1, 4-ESS2-2, 4-ESS3-1, 4-ESS3-2, 3-5 ETS 1-1, 3-5-ETS1-2, 3-5-ETS1-3. Fifth Grade: 5-PS1-2, 5-PS1-4, 5-PS2-1, 5-PS3-1, 5-LS2-1, 5-ESS1-1, 5-ESS1-2, 5-ESS2-2, 5-ESS3-1, 3-5 ETS 1-1, 3-5-ETS1-2, 3-5-ETS1-3.	
Virginia includes three additional standards.	VA 1.2: *The student will investigate and understand that moving objects exhibit different kinds of motion.* VA 1.8: *The student will investigate and understand that natural resources are limited.* VA 2.5: *The student will investigate that living things are part of a system.*	
Virginia has general standards under "Reasoning" that only tangentially overlap with those of Wyoming.	Example: Length, mass, volume, and temperature are measured using nonstandard units.	

INDIANA		
Overall Finding:	Indiana's 6-12 science standards vary greatly from those of Wyoming. In general, Indiana covers the same topic areas as Wyoming, however at the high school level the standards are organized by course and are far more specific in many cases. For example, one standard from Wyoming may be broken into multiple more specific standards in Indiana. This content is (many times) implied in the Wyoming standards but not explicitly written. There are also standards that Indiana does not cover that Wyoming includes. Given the structure of Indiana's standards, judgements on rigor were only made when there was clear and convincing evidence of a change in rigor. Indiana adds Science Content Literacy Standards in reading and writing in Grades 6-12. Some of these parallel Wyoming's cross-curricular ELA/Literacy connections but in Indiana, they are listed as standards to be explicitly addressed in science courses. Indiana breaks middle school standards out by grade level. The WY ETS1 standards are the same as the Indiana Engineering standards found in Grades 6, 7, and 8. Indiana organizes its high school standards within the course subject areas of Anatomy and Physiology, Biology, Chemistry, Earth and Space Science, Environmental Science, Integrated Chemistry and Physics, Physics I, and Physics II. The Wyoming ETS1 standards are not explicitly found in the Indiana course standards although some of the skills required such as defining problems, developing solutions, and improving designs may be, just not with an engineering focus.	
Differences:	**Examples:**	
	Wyoming	Indiana
In many cases, each state's standards cover related concepts in different ways.	MS-LS3-1: *Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.*	7.LS.2: *Create a model to show how the cells in multicellular organisms repeatedly divide to make more cells for growth and repair as a result of mitosis. Explain how mitosis is related to cancer.*
	MS-ESS3-1: *Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.*	7-ESS-7: *Describe the positive and negative environmental impacts of obtaining and utilizing various renewable and nonrenewable energy resources in Indiana. Determine which energy resources are the most beneficial and efficient.*
	HS-PS1-6: *Evaluate the design of a chemical system by changing conditions to produce increased amounts of products at equilibrium, and refine the design, as needed.*	C.4.5: *Use a balanced chemical equation to calculate the quantities of reactants needed and products made in a chemical reaction that goes to completion.*
In a few cases, Indiana's standards are less rigorous than those of Wyoming.	HS-PS1-8: *Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.*	C.2.6: *Describe nuclear changes in matter, including fission, fusion, transmutations, and decays.*

INDIANA	
	In many cases the Wyoming standards focus on developing and testing models. This direction is missing in most cases from the Indiana standards.
Indiana includes additional standards not included in Wyoming or expands on the standards that Wyoming includes.	HS-LS1-3: *Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.* B.1.3:[2] *Develop and use models that illustrate how a cell membrane regulates the uptake of materials essential for growth and survival while removing or preventing harmful waste materials from accumulating through the processes of active and passive transport.* AP.1.3: *Explore the homeostatic range to sustaining human life, the principal mechanism involved, and predict the consequences of what happens when homeostasis is not maintained.* Indiana includes standards for a course on Integrated Chemistry and Physics that includes some standards related to each area and a large number of additional related standards. ICP.5.8: *Collect and use experimental data to determine the number of items in a sample without actually counting them and qualitatively relate this to Avogadro's hypothesis.* ICP.10.5: *Explain the potential applications and possible consequences as the result of nuclear processes such as the generation of energy at nuclear power plants, including the potential damage that radioactivity can cause to biological tissues.* Indiana also includes standards for a course on anatomy and physiology.
Indiana does not include some of Wyoming's standards.	MS-PS1-6: *Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.* MS-LS1-8: *Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.* MS-ESS2-5: *Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.* Additional standards not covered:[3] MS-PS2-3, MS-PS2-5, MS-PS3-2, MS-PS3-3, MS-PS4-1, MS-PS4-3, MS-LS2-1,[4] MS-LS2-5, MS-ESS2-6, MS-ESS3-2, HS-PS1-5, HS-PS2-3, HS-PS2-6, HS-PS4-2.

[2] A large number of Indiana's Anatomy and Physiology standards target aspects of homeostasis.
[3] For a standard at the high school level to be considered not covered there had to be not highly related standard(s) included in Indiana that would meet the majority of the standard.
[4] This standard is covered in high school in Indiana.

MASSACHUSETTS		
Overall Finding: Massachusetts' 6-12 science standards are similar to those of Wyoming. Massachusetts' includes additional standards but does not include some of Wyoming's standards. Key differences observed include changes in specificity, expansiveness, and rigor. On the whole, the rigor was judged to be equivalent between the two standard sets. In addition, Massachusetts provides individual standards for students at Grades 6-8 instead of standards targeting the entirety of middle school.		
Differences:	**Examples:**	
Some of Massachusetts' standards are less rigorous than those of Wyoming.	Wyoming	Massachusetts
	MS-PS2-2: <u>*Plan an investigation to*</u> *provide evidence that the change in an object's motion depends of the sum of the forces on the object and the mass of the object.*	*Provide evidence that the change in an object's speed depends on the sum of the forces of the object (the net force) and the mass of the object.*
	MS-LS1-7: <u>*Develop a model*</u> *to describe how food molecules (sugar) are rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.*	*Use informational text to describe that food molecules, including carbohydrates, proteins, and fats, are broken down and rearranged through chemical reactions forming new molecules that support cell growth and/or release of energy.*
	HS-PS2-5: <u>*Plan and conduct*</u> *an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.*	*Provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.*

MASSACHUSETTS		
Some of Massachusetts' standard are more rigorous than those of Wyoming.	MS-LS1-3: *Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.*	*<u>Construct</u> an argument supported by evidence that the body systems interact to <u>carry out essential functions of life</u>.*
	MS-ESS1-1: *Develop and use a model of the Earth-sun-moon systems to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.*	*Develop and use a model to <u>explain the causes</u> of lunar phases and eclipses of the Sun and Moon.*
	HS-PS1-1: *Use the periodic table as a model to predict the relative properties of elements based on patterns of electrons in the outermost energy levels of atoms.*	*<u>Use the periodic table as a model to predict the relative properties of main group elements, including ionization energy and relative sizes of atoms and ions, based on the patterns of electrons in the outermost energy levels of atoms.</u>* *<u>Use the patterns of valence electron configurations, core changes, and Coulomb's law to explain and predict general trends in ionization energies, relative sizes of atom and ions, and reactivity of pure elements.</u>*
Some of Massachusetts' standards are more specific than those of Wyoming.	MS-LS1-2: *Develop and use models to describe the parts, functions, and basic processes of cells.*	*Develop and use a model to describe how parts of cells contribute to the cellular functions of <u>obtaining food, water, and other nutrients from its environment, disposing of energy, and providing energy for cellular processes</u>.*
	MS-LS2-5: *Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*	*Evaluate competing design solutions for protecting an ecosystem. <u>Discuss benefits and limitations of each design</u>.*

MASSACHUSETTS		
Massachusetts expands on some of Wyoming's standards.	MS-L2-3: *Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.*	*Develop a model to describe that matter and energy are transferred among living and nonliving parts of an ecosystem <u>and that both matter and energy are conserved through these processes</u>.*
	HS-PS1-3: *Plan and conduct an investigation to gather evidence to compare the structure of substances at the macroscopic scale to infer the strength of electrical forces between particles.*	*Cite evidence to relate physical properties of substances at the bulk scale to spatial arrangements, movement, and strength of electrostatic forces among ions, small molecules or regions of large molecules in the substances. Make arguments to account for how compositional and structural differences in molecules result in different types of intermolecular or intramolecular interactions.*
The scope of some of Massachusetts' standards differs from that of the corresponding standards from Wyoming.	MS-ESS2-3: *Analyze and interpret <u>data</u> on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motions.*	*Analyze and interpret <u>maps</u> showing the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of that Earth's plates have moved great distances, collided, and spread apart.*
	MS-ESS-3-5: *Ask questions to clarify evidence of the factors that have caused changes in global temperatures over time.*	*Examine and interpret data to <u>describe the role that human activities</u> have played in causing the rise in global temperatures <u>over the past century</u>.*
	HS-LS1-2: *Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within <u>multicellular organisms.</u>*	*Develop and use a model to illustrate the key functions of <u>animal body systems</u>.*

MASSACHUSETTS	
Massachusetts does not include some of Wyoming's standards.	MS-LS1-6: *Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.* MS-ETS1-3: *Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.* HS-ESS1-6: *Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's information and early history.* Other standards not included by Massachusetts: MS-PS-1-3, MS-LS1-8, MS-LS4-6, MS-ESS1-3, HS-PS4-2, HS-LS2-8, HS-LS4-6, HS-ESS2-7, HS-ESS3-4, HS-ESS3-6.
Massachusetts includes 15 additional standards.	7.MS.PS3-6: *Use a model to explain how thermal energy is transferred out of hotter regions or objects and into colder ones by convection, conduction, and radiation.* 8.MS-LS3-3: *Communicate through writing and in diagrams that chromosomes contain many distinct genes and that each gene holds the instructions for the production of specific proteins, which in turn affects the traits of an individual.* 8.MS-LS3-4: *Develop and use a model to show that sexually reproducing organisms have two of each chromosome in their cellular nuclei, and hence two variants (alleles) of each gene that can be the same or different from each other, with one random assortment of each chromosome passed down to offspring from both parents.* 6.MS-ESS1-5: *Use geographical displays to illustrate that Earth and its solar system are one of many in the Milky Way galaxy, which is one of billions of galaxies in the universe.* HS.PS.1.-7: Use mathematical representations and provide experimental evidence to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. Use the mole concept and proportional relationships to evaluate the quantities (masses or moles) of specific reactants needed in order to obtain a specific amount of product.

MASSACHUSETTS	
Massachusetts +includes additional standards targeting Engineering, Technology, and Applications to Science.	6.MS-ETS1-5: *Create visual representations of solutions to a design problem. Accurately interpret and apply scale and proportion to visual representations.* 6.MS-ETS1-6: *Communicate a design solution to an intended user, including design features and limitations of the solution.* 7.MS-ETS1-7: *Construct a prototype of a solution to a given design problem.* 6.MS-ETS2-3:[5] *Choose and safely use appropriate measuring tools, hand tools, fasteners, and common hand-held power tools to construct a prototype.* (See note below re change in focus for ETS2 standards). 8.MS.ETS2-4: *Use informational text to illustrate that materials maintain their composition under various kinds of physical processing; however, some material properties may change if a process changes the particular structure of the material.* 8.MS.ETS2-5: *Present information that illustrates how a product can be created using basic processes in manufacturing systems, including forming, separating, conditioning, assembling, finishing, quality control, and safety. Compare the advantages and disadvantages of human v. computer control of these processes.* HS-ETS1-5:[6] *Plan a prototype or design solution using orthographic projections and isometric drawings, using proper scales and proportions.* HS-ETS1-6: *Document and present solutions that include specifications, performance results, success and remaining issues, and limitations.* Additional middle school ETS standards that target Materials, Tools, and Manufacturing. The standard numbers align to Wyoming's ETS2[7] DCI but the focus is different. Grade 7: *ETS3, Technological Systems* (with 5 standards). HS: ETS2: *Materials, Tools, and Manufacturing* (with 4 standards). HS: ETS3: *Technological Systems* (with 6 standards). HS: ETS4: *Energy and Power Technologies* (with 5 standards).

[5] Both Wyoming and Massachusetts include a standard labeled ETS2, however the Massachusetts standard varies in content and scope.
[6] This standard differs from the Wyoming standard with the same designation.
[7] EST2 in Massachusetts is not equivalent to the EST2 standard in Wyoming.

<table>
<tr><th colspan="3">NEW HAMPSHIRE</th></tr>
<tr><td colspan="3">Overall Finding: New Hampshire's 6-12 science standards area similar to the Next Generation Science Standards (NGSS) on which Wyoming's standards are based. New Hampshire's standards differ from those adopted by Wyoming in 4 ways: (1) Wyoming removed one middle school standard from the NGSS; (2) Wyoming added the NGSS MS-ETS2 Disciplinary Core Idea (Links Among Science, Engineering, and Technology) and developed specific performance expectations for the two component ideas under that DCI; (3) Wyoming removed one high school standard and incorporated it into a new standard; and (4) Wyoming has one standard that is more specific and one that is more expansive than New Hampshire.</td></tr>
<tr><td>Differences:</td><td colspan="2">Examples:</td></tr>
<tr><td></td><td>Wyoming</td><td>New Hampshire</td></tr>
<tr><td>Wyoming has one standard that is more specific than that of New Hampshire.</td><td>HS-LS2-6: Evaluate the claims, evidence, and reasoning that complex biotic and abiotic interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a modified ecosystem.</td><td>Evaluate the claims, evidence, and reasoning that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a modified ecosystem.</td></tr>
<tr><td>Wyoming has one standard that is more expansive than that of New Hampshire.</td><td>HS-LS1-6: Construct explanations and revise, as need based on evidence for: (1) how carbon, hydrogen, and oxygen may combine with other elements to form amino acids and/or other large carbon-based molecules, and (2) how other hydrocarbon molecules may also combine to form large carbon-based molecules.</td><td>Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.</td></tr>
<tr><td>Wyoming removed one NGSS middle school Life Sciences standard.</td><td colspan="2">Wyoming removed MS-LS4-3 (Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy) and stated that:
• The Recapitulation Theory (Biogenetic Principle) is no longer scientifically valid.
• The standard was written in a way that overlapped with curricular decisions.
• Developmental appropriateness for younger middle school students is questionable.
• Removal does not affect the learning progressions.</td></tr>
</table>

NEW HAMPSHIRE	
Wyoming added the NGSS MS-ETS2 Disciplinary Core Idea (Links Among Science, Engineering, and Technology) and developed specific performance expectations for the two component ideas under that DCI.	Wyoming added the NGSS MS-ETS2 Disciplinary Core Idea (Links Among Engineering, Science, and Technology) two standards and included specific performance expectations: MS-ETS2-1: (Interdependence of Science, Engineering, and Technology – NGSS component idea ETS2-A). WY Performance Expectation - *Ask questions about a common household appliance, collect data to reverse-engineer the appliance and learn how it's design has evolved, describe how scientific discoveries, technological advances, and engineering design played significant roles in its development, and explore how science, engineering, and technology might be used together or individually in producing improved versions of the appliance.* MS-ETS2-2: (Influence of Engineering, Technology, and Science on Society and the Natural World – NGSS component idea ETS2-B). WY Performance Expectation - *Develop a model defining and prioritizing the impacts of human activity on a particular aspect of the environment, identifying positive and negative consequences of the activity, both short and long-term, and investigate and explain how the ethics and integrity of scientists and engineers and respect for individual property rights might constrain future development.*
Wyoming removed one high school standard and incorporated it into a new standard.	Wyoming removed HS-PS4-4, *Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter*. Added HS-ETS1-5, *Evaluate the validity and reliability of claims in a variety of materials.*

NEW JERSEY
Overall Finding: Same 6-12 standards as New Hampshire.

VERMONT
Overall Finding: Same 6-12 standards as New Hampshire.

VIRGINIA		
Overall Finding: Virginia's Science Standards of Learning (SOL) were adopted in 2010, prior to the release of the National Research Council's (NRC) 2011 framework and the Next Generation Science Standards (NGSS). Virginia's 6-12 standards differ greatly from those of Wyoming, for example standards are available for Grade 6 and then subsequent standards are delimitated by content area. Overall, Virginia's standards were found to be less rigorous and specific than those of Wyoming. Virginia does not include a large number of standards that Wyoming includes.		
Differences:	**Examples:** Wyoming	Virginia
Virginia's standards are less rigorous than those of Wyoming. In addition, some standards are both less rigorous and less specific than those of Wyoming.	WY MS-PS1-4: *Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.*	VA PS.7: *The student will investigate and understand key forms of energy and how energy is transferred and transformed.*
	WY HS-LS1-1: *Construct an explanation based on evidence for how the structure of DNA determine the structure of proteins which carry out the essential functions of life through systems of specialized cells.*	VA LS.2: *The student will investigate and understand that all living things are composed of cells.*
Many of Virginia's standards are less specific than those of Wyoming but were not judged to have a different level of rigor.	WY MS-PS3-4: *Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.*	VA 6.2: *The student will investigate and understand basic sources of energy, their origins, transformations, and uses.*
	WY MS-PS4-2: *Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.*	VA PS.8: *The students will investigate and understand the characteristics of sound waves.*
	WY HS-LS1-5: *Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.*	VA LS.5: *The student will investigate and understand the basic physical and chemical processes of photosynthesis and its importance to plant and animal life.*
Virginia has a few standards that are more specific than those of Wyoming.	WY MS-LS-2-4: *Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.*	VA LS.10: *The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic, change over time, and respond to daily, seasonal, and long-term changes in their environment.*

VIRGINIA		
Virginia has a few standards that are more expansive than those of Wyoming.	WY MS-ESS1-1: *Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.*	VA 6.8: *The student will investigate and understand the characteristics of Earth and the solar system. Key concepts in include a) position of earth in the solar system, b) sun-Earth-moon relationships (seasons, tides, and eclipses); c) characteristics of the sun, planets and their moons, comets, meteors, and asteroids, and d) the history and contributions of space exploration.*
Virginia does not include some of Wyoming's standards. (*N* = 52)	WY HS-LS1-2: *Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.* Others: MS-PS3-2, MS-PS4-3, MS-LS1-7, MS-LS1-8, MS-LS2-5, MS-LS4-2, MS-LS4-5, MS-ESS1-3, MS-ESS2-6, MS-ESS3-2, MS-ESS3-5, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, MS-ETS2-1, MS-ETS2-2, HS-PS1-6, HS-PS2-4, HS-PS2-6, HS-PS3-2, HS-PS3-3, HS-PS3-4, HS-PS3-5, HS-PS4-2, HS-PS4-5, HS-LS1-2, HS-LS1-3, HS-LS-7, HS-LS2-2, HS-LS2-3, HS-LS2-4, HS-LS3-3, HS-LS4-2, HS-LS4-3, HS-LS4-6, HS-ESS2-1, HS-ESS2-2, HS-ESS2-3, HS-ESS2-4, HS-ESS2-7, HS-ESS3-1, HS-ESS3-2, HS-ESS3-4, HS-ESS3-5, HS-ETS1-1, HS-ETS1-2, HS-ETS1-3, HS-ETS1-4.	

Appendix E

Graduation and Hathaway Requirements

Exhibit 1. Hathaway Scholarship Requirements

Honors **($1,680 per semester)**	**Performance** **($1,260 per semester)**	**Opportunity** **($840 per semester)**	**Provisional Opportunity** **($840 per semester)**
4 years Hathaway-approved Language Arts in grades 9-12 that include the standards: Reading, Writing, Listening, Speaking 4 years Math – must take the following courses, which can occur before grade 9: Algebra I, Algebra II, Geometry, a Hathaway-approved additional course 4 years Science – which includes at least 3 years of any of the courses listed and an additional approved course in grades 9-12: Biology I, Biology II, Geology I, Physics I, Physics II, Chemistry I, Chemistry II, Physical Science, Computer Science 3 years Social Studies in grades 9-12 to include a combination of: World History, American History, Geography, American Government, Economic Systems and Institutions 2 sequenced years of the same Foreign Language, which do not need to be back-to-back, one of which must be taken in grades 9-12. ACT Score of 25 H.S. GPA of 3.5 Additional Requirements: 2 years of either fine arts, career and technical education, or additional foreign language (non-sequenced) (9-12 grade only) Scholarship may be used at a WY Community College, University of Wyoming, or a combination of the two types of institutions (for Honors, Performance, and Opportunity scholarships)	Same requirements as Honors on language arts, math, science, social studies, foreign language coursework, and additional requirements. ACT Score of 21 H.S. GPA of 3.0	Same requirements as Honors on language arts, math, science, and social studies coursework. No foreign language requirement (but can take as an additional requirement) ACT Score of 19 H.S. GPA of 2.5 Additional Requirements: 2 years of either fine arts, career and technical education, or 2 years of foreign language (sequenced) (9-12 grade only)	Must meet current high school graduation requirements in language arts, math (which must include at least two of these three courses: Algebra I, Algebra II, Geometry), science, and social studies. ACT Score of 17 H.S. GPA of 2.5 Additional Requirements: 2 years of either fine arts, career and technical education, or 2 years of foreign language (sequenced) (9-12 grade only) Students may also qualify by taking the ACT Workkeys, a job skills test, with a score of 12 or better. Provisional Opportunity scholarship recipients must start at a WY Community College.

Exhibit 2. Minimum High School Graduation Requirements – Regional State Comparison

Wyoming	Colorado	Idaho	Montana	Nebraska	North Dakota	South Dakota	Utah
4 school years of English 3 school years of mathematics 3 school years of science 3 school years of social studies, including history, American government, and economic systems and institutions Satisfactory performance on an examination of principles of the Constitution of the United States and the State of Wyoming as required by W.S. 21-9-102. Evidence of proficient performance, at a minimum, on the uniform student content and performance standards for the common core of knowledge and skills specified under W.S. 21-9-101(a). Source: Wyoming Department of Education, Chapter 31, Graduation Requirements	State graduation guidelines stipulate that students must demonstrate college or career readiness in English and math based on demonstration of competency on at least one measure such as the ACT, AP, SAT. For example, on the ACT, students need to score at 18 on ACT English and a 19 on ACT math. Other options include through AP, IB, or concurrent enrollment course performance, or capstone or industry certificate. There are no specific courses, or number of courses required by the state's graduation guidelines (districts set their own guidelines based on many factors), and there are no legislated course requirements other than one course in Civics" "History and civil government of the United States and of the state of Colorado, pursuant to Colorado statute 22-1-104, Teaching of history, culture, and	46 credits (29 in core subjects and 17 in elective subjects) The 29 credits in Core Subject areas must include: 9 credits Language Arts (8 English, 1 Speech) 6 credits mathematics (including Algebra 1 and Geometry standards) 6 credits science (4 lab) 5 credits social studies (U.S. History, Economics, and American Government) 2 credits Humanities (Interdisciplinary Humanities, Fine Arts, or Foreign Language) 1 credit Health	20 units of study which include the following 13 units: 4 units of English language arts 2 units of mathematics 2 units of science 2 units of social studies 1 unit of health enhancement, with ½ unit each year for two years 1 unit of arts 1 unit of career and technical education	200 credits with at least 80 percent from the core curriculum. 40 credits in English 30 credits in mathematics 30 credits in science 30 credits in social studies	22 credits required including: 4 credits of English Language Arts from a sequence that includes literature, composition, and speech: 3 credits of mathematics 3 credits of science including life science and biology 3 credits of social studies including US History, US Gov, Problems and Democracy 1 credit PE and/or Health 3 credits of Foreign Language; Native American Languages; Fine Arts; or Career and Technical Education courses Any 5 additional credits	22 credits of which 16.5 include (1 unit = 1 year of instruction): 4 units of Language Arts (Writing: 1.5 units; Speech or Debate: .5 unit; Language Arts elective: .5 unit; Literature: 1.5 unites of which .5 must be American Literature) 3 units of mathematics (Algebra 1: 1 unit; Algebra II: 1 unit; Geometry: 1 unit) 3 units of Lab Science (Biology: 1 unit; any Physical Science: 1 unit; Chemistry or Physics: 1 unit) 3 units of Social Studies (U.S. History: 1 unit; U.S. Government: .5 unit; World History: .5 unit; Geography: .5 unit; Social Studies elective: .5 unit) 1 unit of any combination of the following: Approved Career and Technical Education; Capstone Experience or Service Learning; World Language 1 unit of Fine Arts	24 credits 4 credits in English/Language Arts 3 credits in mathematics (successful completion of Secondary Mathematics I, II, and III or higher; other courses such as Calculus can satisfy this requirement) 3 credits in science (2 credits from the four science foundation areas: Earth Systems, Biological Science, Chemistry, or physics; 1 credit from the foundation courses or the applied or advanced science core list) 3 credits social studies (1 credit U.S. History, .5 credits Geography, .5 credits Civilization, .5 credits U.S. Government and Citizenship, .5 credits General Financial Literacy) 3 credits Directed Coursework (1.5 credits Fine Arts, 1 credit CTE., .5 credits computer

Wyoming	Colorado	Idaho	Montana	Nebraska	North Dakota	South Dakota	Utah
"School years" is defined as the credit earned during a school year which is synonymous with a Carnegie Unit of study that reflects the instructional time provided in a class calculated by multiplying the number of minutes a district uses for a class by the number of pupil-teacher contact days in the district calendar as approved by the State Board of Education. This instructional time is usually between 125 and 150 hours in a calendar school year.	civil government.					½ unit of Personal Finance or Economics ½ unit of Physical Education ½ unit of Health or Health Integration The remaining credits are from electives.	technology) Physical Education (consists of various .5 credit courses) 6 credits required electives

Exhibit 3. Minimum High School Graduation Requirements – High Performing States Comparison

Wyoming	Indiana	Massachusetts	New Hampshire	New Jersey	Vermont	Virginia
4 school years of English 3 school years of mathematics 3 school years of science 3 school years of social studies, including history, American government, and economic systems and institutions Satisfactory performance on an examination of principles of the Constitution of the United States and the State of Wyoming as required by W.S. 21-9-102. Evidence of proficient performance, at a minimum, on the uniform student content and performance standards for the common core of knowledge and skills specified under W.S. 21-9-101(a). Source: Wyoming Department of Education, Chapter 31, Graduation Requirements “School years” is defined as the credit earned during a school year which is synonymous with a Carnegie Unit of study that reflects the instructional time provided in a class	Students can choose between the Core 40 diploma, or the Core 40 with Honors, or Core 40 with Technical Honors. There is also an opt-out option, the General Diploma. *Core 40 Diploma* English/ Language Arts: 8 credits (Including a balance of literature, composition and speech). Mathematics: 6 credits in grades 9-12 (2 credits: Algebra I, 2 credits: Geometry, 2 credits: Algebra II, Or complete Integrated Math I, II, and III for 6 credits. Students must take a math course or quantitative reasoning course each year in high school). Science: 6 credits (2 credits: Biology I; 2 credits: Chemistry I or Physics I or Integrated Chemistry-Physics, 2 credits: any Core 40 science course). Social Studies: 6 credits (2 credits: U.S. History, 1 credit: U.S. Government, 1 credit:	All students must meet the Competency Determination (CD) standard, in addition to meeting all local graduation requirements. *Competency Determination Graduation Requirement:* Students must earn a scaled score of at least 240 on the grade 10 MCAS ELA and Mathematics tests, or earn a scaled score between 220 and 238 on these tests, or earn a score of Needs Improvement on a competency portfolio, and fulfill the requirements of an Educational Proficiency Plan (EPP). Students must also earn a scaled score of at least 220 on one of the high school MCAS Science and Technology/Engineering (STE) tests: Biology, Chemistry, Introductory Physics, or Technology/Engineering, or a score of Needs Improvement on a competency portfolio in one of these STE disciplines.	4 credits of English 2 credits of Mathematics 1 credit of Physical Sciences 1 credit of Biological Sciences 1 credit of US and NH History and Government 0.5 credit of Basic Business and Economic Education One credit of Physical Education 0.75 credit of Health Education 0.5 credit of Arts Education 0.5 credit of Computer Education Seven units of Electives	Language arts literacy: 20 credits Math: 15 credits Science: 15 credits Social studies: 15 credits Financial, economic, business and entrepreneurial literacy: 2.5 credits Health, safety and physical education: 3.75 credits per year Visual and performing arts: 5 credits Career-technical education: 5 credits World languages: 5 credits	The state of Vermont requires each student to complete at least 20 Carnegie units, including the following: Four years of English language arts Three years of Science Three years of Mathematics Three years of history, civics, and social sciences (including one year of U.S. history and government) One year of arts A year and a half of physical education	Virginia has two primary diploma options: *Standard Diploma* A student must earn at least 22 standard units of credit by (1) passing required courses and electives, including: English: 4 units Mathematics, Laboratory Science, and History & Social Sciences: 3 units each Health & Physical Education: 2 units Foreign Language, Fine Arts or Career & Technical Education: 2 units Economics and Personal Finance: 1 unit Electives: 4 units (2) earn at least six verified credits by passing end-of-course SOL tests or other assessments approved by the Board of Education. (3) earn a board-approved career and

Wyoming	Indiana	Massachusetts	New Hampshire	New Jersey	Vermont	Virginia
calculated by multiplying the number of minutes a district uses for a class by the number of pupil-teacher contact days in the district calendar as approved by the State Board of Education. This instructional time is usually between 125 and 150 hours in a calendar school year.	Economics, 2 credits: World History/ Civilization or Geography/ History of the World Directed Electives: 5 credits(World Languages, Fine Arts, Career and Technical Education) PE: 2 credits Health and Wellness: 1 credit Electives* 6 credits (College and Career Pathway courses recommended) *Core 40 with Academic Honors* Includes above as well as additional math credit, language credit, and fine arts credit requirements, as well as performance requirements including 3.0 GPA and a certain scores on ACT or AP/IB/concurrent courses *Core 40 with Technical Honors* Includes above as well as earning 6 credits in a state-approved College & Career Pathway and one of the following: 1. Pathway designated industry-based					technical education credential to graduate with a Standard Diploma; and (4) successfully complete one virtual course, which may be non-credit bearing. *Advanced Studies Diploma* (1) 26 standard units in: English, Math, Science and History and Social Sciences: 4 units each Foreign Language: 3 units Health & Physical Education: 2 units Fine Arts or Career & Technical Education: 1 unit Economics and Personal Finance: 1 unit Electives: 3 units (2) 9 verified units, and (3) successfully complete one virtual course

Wyoming	Indiana	Massachusetts	New Hampshire	New Jersey	Vermont	Virginia
	certification or credential, or 2.Pathway dual credits from the approved dual credit list resulting in 6 transcripted college credits; as well as performance requirements including 3.0 GPA and a certain scores on ACT, Workkeys, Compass or AP/IB/concurrent courses					

Exhibit 4. High School Graduate/New First-Year Student Admission Requirements to Enter a Public College or University- Regional States

Wyoming	Colorado	Idaho	Montana	Nebraska	North Dakota	South Dakota	Utah
University of Wyoming Cumulative, unweighted high school GPA of 3.0 (on a 4.0 scale) Minimum composite ACT score of 21 or SAT score of 1060 (math/critical reasoning combined) **Completion of the success curriculum** while attending high school (this is the Hathaway Success Curriculum for the Honors and Performance Scholarships) Admission with Support is available if you submitted official ACT or SAT scores. You can have a cumulative, unweighted high school GPA of 2.5-2.99 or 2.25-2.49 and a minimum composite ACT score of 20 or SAT score of 1020 (math/critical reasoning combined).	*University of Colorado* Does not specify a minimum GPA or minimum ACT/SAT scores but the middle 50% of enrolled first-time freshman have a high school GPA of 3.43 - 4.0, an ACT composite core of 25-31, or a combined SAT total Math and Evidence-Based Reading & Writing score of 1180 – 1350. **Minimum Academic Preparation Standards for College of Arts and Sciences (17 units):** 4 units (years) English (including 2 of composition) 4 units mathematics (includes at least 2 of Algebra, 1 of Geometry, and 1 of college prep math) 3 units natural science (includes 2 of lab science, 1 of which must be either chemistry or physics) 3 units social science (includes 1 of U.S. or world history and 1 of geography)	*University of Idaho* Students have to input their unweighted high school GPA and/or ACT or SAT scores via a weblink to see if they meet minimum admission requirements. A GPA of 3.0 met the minimum requirement without ACT and/or SAT scores. (It would take time going through the calculator to determine what is required if the GPA is 2.9 or below). **Academic Core Requirements:** **English** 8-credit (4 years) minimum requirement; Compo sition, literature, or courses that integrate composition, language, and literature. **Humanities & Language** **2-credit (1 year) minimum requirement;** literature, history,	*University of Montana* Primary Requirements: An ACT composite score of 22, or a SAT combined score of 1120 (1540 for tests prior to March 2016), or a 2.50 cumulative grade-point average, or a class rank in the upper half of your high school graduating class. **College Preparatory Requirements:** 4 years of English 3 years of math, including Algebra I, Geometry and Algebra II. Students are encouraged to take a math class their senior year of high school. 3 years of social studies, including one year of global studies, one year of American history and one year of government or another third-year course (i.e., economics, psychology, sociology). 2 years of laboratory science. One must be	*University of Nebraska-Lincoln* Score 20 or higher on the ACT, writing portion not required. Or, score a total of 1030 or higher on the SAT Critical Reading and Math sections. Or, rank in the top half of your high school graduating class. All first-year applicants under the age of 23 are required to submit an official ACT or SAT score. **Core Course Requirements (16 units)** 4 units of English: Units must include intensive reading and writing experiences. 4 units of math: Algebra, Algebra II, Geometry, 1 additional unit that builds on knowledge and concepts learned in Algebra II 3 units of social sciences: 1 unit drawn from American and/or world history, 1 additional unit drawn from history,	*University of North Dakota* **High school GPA and ACT or SAT score:** GPA: 3.5-4.0, minimum ACT or SAT* score of: 18 ACT or 940 SAT (math & reading) GPA: 3.00 - 3.49, minimum ACT or SAT* score of: 20 ACT or 1020 SAT (math & reading) GPA: 2.75 - 2.99, minimum ACT or SAT* score of: 22 ACT or 1100 SAT* (math & reading) **Successful completion of 15 units of high school core courses:** English (4 units) Math (3 units of Algebra I or above) Lab Science (3 units) Social Studies (3 units) 2 additional units from any category above (English, Math, Lab Science or Social Studies) or	*University of South Dakota* GPA of at least 2.6 (on a 4.0 scale) in all high school courses, Or ACT composite score of 21 or above (SAT 990), Or Rank in the upper 50% of your high school graduating class **High school coursework requirements** (course must completed with a "C" average or better): 4 years of English (or ACT English sub-test score of 21 or above or AP English score of 3 or above) 3 years of advanced mathematics (or ACT math sub-test score of 23 or above or AP Calculus score of 3 or above) 3 years of laboratory science (or ACT science reasoning sub-test score of 20 or above or AP Science score of 3 or above)	*University of Utah* Does not specify a minimum GPA or minimum ACT/SAT scores but the middle 50% of enrolled first-time freshman have at high school GPA of 3.4-3.9, an ACT composite of 22-29, or a combined SAT score of 1140-1330. Transfer students must have a minimum GPA of 2.6. **High School Core Requirements:** 4 years of English emphasizing composition and literature 2 years of mathematics beyond elementary algebra (selected from geometry, intermediate algebra, trigonometry, college or advanced algebra, or calculus) 3 years biological and/or physical science, two of which are required to be taken from the following: chemistry, physics and biology or human biology (one of the sciences

Wyoming	Colorado	Idaho	Montana	Nebraska	North Dakota	South Dakota	Utah
	3 units single foreign language 1 unit academic elective	philosophy, foreign language, fine arts (history, theory, appreciation, and evaluation) and interdisciplinary humanities (related study of two or more of the traditional humanities disciplines). These courses should emphasize history, appreciation, theory, analysis, and/or critique. History courses beyond those required for state high school graduation may be counted. Foreign language study is strongly recommended. **Math** **6-credit (3 years) minimum requirement;** algebra I or applied math I, geometry or applied math II, and algebra II. (Applied math courses must be approved by the Idaho State Department of Education.); an additional two (2) credits are strongly recommended; other course work may include probability, discrete math,	earth science, biology, chemistry or physics. The second year may be one of those sciences or another approved college preparatory laboratory science. 2 years chosen from the following: foreign language (preferably two years), computer science, visual and performing arts, or vocational education. In order to be fully admitted to the University of Montana (without conditions or provisions), students must demonstrate readiness in areas of mathematics and writing. Typically, students demonstrate their readiness by fulfilling at least one criterion in each of the following proficiency requirement sections: **Math Proficiency Requirements** A score of 22 on the ACT Math section or a score of 27.5 on the SAT Math Test (520 on SAT Math for tests prior to March	American government and/or geography, a 3rd unit drawn from any social science discipline 3 units of natural sciences: At least 2 units selected from biology, chemistry, physics, earth sciences 1 unit must include laboratory instruction 2 units of foreign language: both units must be in the same language. Students who are unable to take 2 years of foreign language in high school may still qualify for admission.	world language (including foreign languages, Native American languages or American Sign Language) Additional factors will be considered, such as grade trends, course difficulty, GPA in core classes, etc.	3 years of social studies (or ACT social studies/reading subtest score or 20 or above or AP Social Studies score of 3 or above) 1 year of fine arts (or AP Fine Arts score of 3 or above).	must include a laboratory experience) 1 year, American history and government. (Processes and structure of democratic governance) Foreign language First and second year (level) of the same foreign language taken during grades 7 through 12 Additional units: 4 years, from at least two of the following: history, English, mathematics beyond intermediate algebra, laboratory science, foreign language, social science, fine arts, technology and engineering education

Wyoming	Colorado	Idaho	Montana	Nebraska	North Dakota	South Dakota	Utah
		analytic geometry, calculus, statistics, and trigonometry; Four of the required mathematics credits must be taken in the 10th, 11th, and/or 12th grades. **Natural Science 6-credit (3 years) minimum requirement;** anatomy, biology, chemistry, geology, earth science, physical science, physiology, physics, and zoology. A maximum of two (2) credits from vocational science courses may be counted if the courses are jointly approved by the Idaho State Department of Education (SDOE) and the State Department of Vocational Education (SDVE); Ecology will count if SDOE approved. At least 2 credits must involve lab science experience. **Social Science 5-credit (2 1/2 years) minimum requirement;** American government (state and local),	2016) or a score of 3 or higher on the AP Calculus AB or BC exam or completion of a Rigorous High School Core that includes four years of math with grades of C or higher or a score of 4 on the International Baccalaureate calculus exam **Writing Proficiency Requirements** A score of 18 on the ACT Combined English/ Writing section or a score of 19 on the new ACT Writing Test Subscore (score of 7 on old scale of 2-12) or a score of 25 on the SAT Writing/Language Test (440 on SAT Writing for tests prior to March 2016) or a score of 7 on the SAT Essay Subscore (for tests prior to March 2016)				

Wyoming	Colorado	Idaho	Montana	Nebraska	North Dakota	South Dakota	Utah
		geography, U.S. history, world history, psychology, sociology, and economics. Approved consumer economics courses may be counted toward this requirement. **Other College Preparation 3-credit (1 1/2 years) minimum requirement;** speech or debate (No more than one credit. Debate must be taught by a certified teacher); Studio/performing arts (art, dance, drama, and music); or foreign language (beyond any foreign language credit applied in the Humanities & Language category).	or a score of 3 on the AP English Language or English Literature exam or a score of 50 on the CLEP Subject Exam in Composition or a score of 4 on the International Baccalaureate Language AI Exam If a student does not demonstrate full readiness prior to Orientation, students must attain full admission status by completing at least one college-level mathematics and college-level composition course with grades of C- or better before completing 32 credits or 3 semesters, whichever comes last.				

**Exhibit 4. High School Graduate/New First-Year Student Admission Requirements to Enter a Public College or University-
High Performing States**

Wyoming	Indiana	Massachusetts	New Hampshire	New Jersey	Vermont	Virginia
University of Wyoming Cumulative, unweighted high school GPA of 3.0 (on a 4.0 scale) Minimum composite ACT score of 21 or SAT score of 1060 (math/critical reasoning combined) **Completion of the success curriculum** while attending high school (this is the Hathaway Success Curriculum for the Honors and Performance Scholarships) Admission with Support is available if you submitted official ACT or SAT scores. You can have a cumulative, unweighted high school GPA of 2.5-2.99 or 2.25-2.49 and a minimum composite ACT score of 20 or SAT score of 1020 (math/critical reasoning combined).	*University of Indiana Bloomington* Applicants should complete at least 34 credits of college-preparatory courses, including: 8 credits (semesters) of English, such as literature, grammar, or composition 7 credits (semesters) of mathematics, including 4 credits of algebra and 2 credits of geometry (or an equivalent 6 credits of integrated algebra and geometry), and 1 credit of pre-calculus, trigonometry, or calculus 6 credits (semesters) of social sciences, including 2 credits of U.S. history; 2 credits of world history/civilization/geography; and 2 additional credits in government, economics, sociology, history, or similar topics 6 credits (semesters) of sciences, including at least 4 credits of laboratory sciences: biology, chemistry, or physics 4 credits (semesters) of world languages 3 or more credits (semesters) of additional college-preparatory courses;	*University of Massachusetts Amherst* Required high school units: English: 4 Mathematics (Algebra II minimum): 4 including math in the senior year of high school Natural Science (3 labs): 3 Social Science (one course in US history): 2 Foreign Language: 2 of same language Electives (from areas above, arts and humanities, or computer science): 2 Applicants to the College of Engineering, Isenberg School of Management, or the Computer Science major must have four math units including an advanced math course, such as Pre Calculus, Calculus or Trigonometry. Applicants to the College of Engineering must also have Chemistry and Physics.	*University of New Hampshire* Most first-year students accepted to a bachelor's degree program have completed rigorous coursework with solid B+ grades, or higher. Students should complete the following sequences of college preparatory coursework to be considered minimally* qualified for baccalaureate admission to the University: Four years of college preparatory English Three years of mathematics including Algebra I, Geometry and Algebra II Three years of science, two of which must be laboratory sciences Three years of social sciences (including U.S. History) Two years of a single foreign language (three years is preferred)	*Rutgers University, New Brunswick* Requirements for School of Arts and Sciences: English: 4 years Foreign Language: 2 years of one language Mathematics: 3 years, including algebra I, geometry, algebra II Science: 2 years Other Courses: 5 other academic courses Total: 16 academic courses Other Schools require additional course work including additional years of math and science depending on field	*University of Vermont* Minimum entrance requirements four years of English three years of mathematics (Algebra I, Algebra II and geometry (or equivalents) two years of the same foreign language (American sign language meets this requirement) three years of a natural or physical science, including a laboratory science three years of social sciences SAT/ACT Score Ranges for Middle 50% of Admitted Students* SAT EBRW: 600-690 SAT Math: 590-680 ACT: 27-32	*Virginia State University* 3 units of mathematics that must include the full Algebra I curriculum and two additional courses at or above the level of Algebra I. It is strongly recommended that students complete Geometry, Algebra II, and a fourth higher level math course 4 units of English 2 units of Science (must include a laboratory science, i.e. Biology, Chemistry or Physics) 2 units of Social Studies (History, Government, Civics, Geography) 2 Units of Foreign Language recommended a minimum cumulative high school GPA of 3.0 (grades 9-11). evidence of strong performance in a challenging academic curriculum as demonstrated by a

Wyoming	Indiana	Massachusetts	New Hampshire	New Jersey	Vermont	Virginia
	additional mathematics credits are recommended for students intending to pursue a science degree and additional world language credits are recommended for all student No minimum GPA, but for fall 2017 the middle 50 percent range for GPA for admitted freshmen was 3.57–4.00. No minimum SAT or ACT, but for fall 2017 the middle 50 percent range of SAT scores (critical reading and math) for admitted freshmen was 1190–1360. The middle 50 percent range for the ACT composite was 26–31.		*Some academic programs require an additional year of preparation in subject areas beyond what is listed above, in particular 4 years of math for related fields. The average SAT combined score for Fall 2015 admissions was 1630 (all three sections). The average ACT composite score was 24			grade of B or better in core course.

Exhibit 6. Similar Scholarship Programs in Comparison States

State	Program	Description	Eligibility Requirements (Academic)
South Dakota	South Dakota Opportunity Scholarship https://sdos.sdbor.edu/	Authorized by the South Dakota Legislature with funding from the state of South Dakota's Education Enhancement Trust Fund. Provides up to $6,500 over four years to a qualifying student who attends an eligible higher education institution in South Dakota. Amounts: $1,300 – 1st year of attendance $1,300 – 2nd year of attendance $1,300 – 3rd year of attendance $2,600 – 4th year of attendance	Students must receive a "C" or higher on all coursework (1 unit = 1 year of instruction) including: 4 units of English (courses with major emphasis on grammar, composition, or literary analysis may be included to meet this requirement) 4 units of Algebra or Higher Mathematics (algebra, geometry, trigonometry, or other advanced mathematics, as well as accelerated or honors mathematics [algebra] at the 8th grade, shall be accepted). Not included are arithmetic, business, consumer, or general mathematics or similar courses. (Note: this is one more unit than what is required for HS graduation) 4 units of Science, including 3 units of approved laboratory science (courses in biology, chemistry, or physics in which at least one regular laboratory is scheduled each week). (Note: this is one more unit than what is required for HS graduation) 3 units of Social Studies (such as history, economics, sociology, geography, U.S. government, and similar courses). 1 unit of Fine Arts (in art, theatre, or music, as well as approved extracurricular activity) 2 units of either of the following or a combination of the two: Approved Career and Technical Education Courses, Modern or Classical Language ½ unit of Personal Finance or Economics ½ unit of Physical Education ½ unit of Health or Health Integration ACT Composite Score of 24 or higher. If using SAT, the sum of the verbal and mathematics score must be at least 1090. Cumulative GPA of 3.0 (on a 4.0 scale) Curriculum requirements specified above are not

State	Program	Description	Eligibility Requirements (Academic)
			required for any student who has received an ACT Composite Score of 28 and meets the ACT college readiness benchmark scores equaling or exceeding 18 for English, 22 for Reading, 22 for Math, and 23 for Science.
Utah	Regents' Scholarship https://stepuputah.com/files/RS Program Guide 18.pdf	The Regents' Scholarship encourages Utah high school students to take a college prep curriculum above and beyond Utah high school graduation requirements and is merit-based. The scholarship is funded by the state of Utah and administered by the State Board of Regents. There are 11 colleges and universities where the scholarship may be used. There are three types of awards: *Base*: Up to $1,000, one time *Exemplary Academic Achievement*: up to $1,250 per semester, renewable for up to 4 semesters *Utah Education Savings Plan (UESP) Supplemental Award*: up to $400 matching funds, one-time A combination of awards is also possible.	*Base Award*: Complete required courses in grades 9-12 with a grade no lower than a "C" (see more detail on pp. 4-9 of the Guide of courses that qualify): 4 credits of English 4 progressive credits of Mathematics 3.5 credits of Social Science 3 credits of lab-based Science, especially one each of Biology, Chemistry, and Physics 2 progressive credits of the same World Language Cumulative H.S. GPA of 3.0 Submit at least one ACT test score *Exemplary Academic Achievement Award:* Must qualify for the Base Award (earning no grade lower than a "B" in the required courses) Cumulative H.S. GPA of 3.5 Submit ACT score of 26 *Utah Education Savings Plan Supplemental Award:* Must qualify for the Base Award plus Be a beneficiary of a UESP account (with stipulations regarding amount contributed to the account each year during ages of 14-17).

Appendix F

Special Education Requirements

Special Education
Wyoming Compared to Regional States

	Wyoming	Colorado	Idaho	Montana	Nebraska	North Dakota	South Dakota	Utah
State has alternate achievement standards[1]	Yes (ELA, math, science)	Yes (ELA, math, science, social studies)	In the process of adopting new alternate achievement standards in ELA and math. Alternate standards in science are under development based on general science standards that were recently adopted.	Yes (ELA and math. Alternative standards and assessment for science are being updated. Teachers will be using Dynamic Learning Maps® aligned to the Next Generation Science Standards until that is finalized.)	Yes (ELA, math, science)	Yes (ELA, math. Science standards are being updated.)	Yes (ELA, math, science)	Yes (ELA, math, science)
Age range for eligibility for services[2]	3–21	3–21	3–21	3–21	Birth–21 (Nebraska is one of only 4 states that mandates this under IDEA, Part B)	3–21	3–21	3–21 (Once a student is eligible, they are entitled to receive Free and Appropriate Education through age 22.)
Age range for transition services[3]	16–21	15–21	16–21 (or younger if appropriate)	16–21	16–21	16–21	16–21	16–21

[1] States are permitted (but not required) to define alternative achievement standards for children with the most significant cognitive disabilities who take an alternate assessment. 34 CFR §200.1(d); https://www.law.cornell.edu/cfr/text/34/200.1
[2] Beginning with PreK under IDEA, Part B, unless otherwise mandated by the state.
[3] In most cases, *planning* for transition services on the student's IEP begins at age 14.

Special Education
Wyoming Compared to State Selected Based on High Academic Performance

	Wyoming	Indiana	Massachusetts	New Jersey	New Hampshire	Vermont	Virginia
State has alternate achievement standards	Yes (ELA, math, science)	Yes (ELA, math, science, and social studies)	Yes (ELA, math, science and technology/ engineering, and history and social science. History and social science are not tested though.)	Yes (ELA, math, science)	Yes (ELA, math, science)	Yes (ELA, math, science. Will be developing in Physical Education. Has an RFP out for new alternate assessment to be based on CCSS and NGSS. Have been using DLM, which is based on Common Core Essential Elements but it is too expensive).	Yes (ELA, math, science, and history and social science)
Age range for eligibility for services	3–21	3–21	3–21	3–21 (Districts may elect to provide services to students younger than 3 and older than 21.)	3–21	3–21	2–21 (A student who turns 22 years of age after September 30 of the student's current school year remains eligible for the remainder of the school year.)
Age range for transition services	16–21	14–21	14–21	16–21	16–21	16–21	16–21

Appendix G

ELL Requirements

ELL Comparison

	How is ELL defined and identified?	Use WIDA standards?	State approved program model?
Wyoming	"The definition of an Active EL student is a student who: ● Is newly enrolled in the district or enrolled in the district after the state annual ELP assessment, ACCESS for ELLs 2.0, was given in the prior school year; and has been identified and evaluated by the district as being an Active EL through the use of an ELP screening assessment; or ● Is returning to the district from the previous school year; and ● Took the state's annual ELP assessment in the prior school year and has not yet achieved a 'proficiency' level." Home language surveys and English language proficiency exams are used for identification.	Yes	No specific required program model; examples of EL program models that meet the requirements of Title III: two-way immersion/dual language, transitional bilingual education, ESL pullout, conten-based ESL, sheltered English instruction, structured English immersion, heritage language, specially designed academic instruction in English, and native language literacy.
Regional States			
Colorado	"A student who is linguistically diverse and who is identified [using the state-approved English language proficiency assessment] as having a level of English language proficiency that requires language support to achieve standards in grade-level content in English." ELPA 22-24-103 (4) Colorado Senate Bill 109, C.R.S. 22 24-106 requires: One common assessment to identify English Learners and measure English language development W-APT – state mandated placement assessment must be used as one indicator to determine if the student is an English Learner and the English language proficiency level of the student ACCESS for ELLs – annual assessment to measure English language proficiency Colorado Senate Bill 109, ELP Assessment "ELPA requires school districts to: Provide an evidence-based ELD program for all eligible K-12 English learners to enable ELs to develop and acquire English proficiency while maintaining grade-level performance in academic content areas C.R.S. 22-24-102 Identify all ELs enrolled in the district using the state-approved ELP assessment (W-APT and ACCESS for ELLs) C.R.S. 22-24-105 Report number of ELs to CDE in Student October Count" C.R.S. 22-24-105 Colorado House Bill	Yes	The ELPA program is funded annually on a per pupil basis. The following programs are eligible for funding under ELPA: Bilingual Education Program, ESL Program, and Other methods of achieving the English language proficiency.
Montana	"Limited English Proficient (LEP) students are those students whose English proficiency or lack thereof, affects success in academic achievement; these students can also be called English Language Learners (ELLs)." Steps to identification involve pre-screening, English language proficiency screener, and consider academic achievement data.	Yes	The state does not prescribe or require any specific models, but offers a list of models for districts to consider that includes Sheltered English, Structured English Immersion, Language Development, ESL Push-In, Two-Way Immersion or Two-Way Bilingual, and Heritage Language or Indigenous Language Program.
Idaho	"An English Learner student in Idaho is classified according to the Federal government definition as described in Public Law 107-110 of NCLB."	Yes	"It is not the purview of the State to determine which program or curriculum materials/resources would work best for all districts; however, it is a Federal requirement that any program of service or curriculum provided to ELs must be research or evidence-based. In addition, OCR and Title III do not mandate or forbid any specific type of language program, such as bilingual education." Programs that can be considered are push-in, pull-out, dual language, bilingual, or newcomer programs.
North Dakota	"To be eligible for English language learner services, a student must: 1. Be at least five years of age, but must not have reached the age of twenty-two; 2. Be enrolled in a school district in North Dakota; 3. Have a primary language other than English or come from an environment in which a language other than English significantly impacts the individual's level of English language proficiency; and 4. Have difficulty speaking, reading, writing, and understanding English as shown by assessment results." (ND Administrative Code Section 67-28-01-04) "North Dakota requires that every district has a plan to identify and assess the language proficiency of students who meet the state ELL definition." The state developed and approved a list of home language surveys that schools can use for identification purposes.	Yes	"Program model based on research; ND content standards must be implemented within the program; English language development standards must be implemented within the program and mainstream classes." Example program models in ND districts such as push-in and pull-out models are given in this document: https://www.nd.gov/dpi/uploads/1370/StaffingProgramModels.pdf.
South Dakota	"English learner students are students with a home language background other than English, whose English language skills are not yet well enough developed for them to be able to participate successfully in classrooms where all academic instruction is provided in English." The state uses federal definition of LEP student. Students are identified as EL with home language surveys and language proficiency assessment.	Yes	Program models include dual language, two-way immersion, transitional bilingual, developmental bilingual, heritage language, sheltered instruction, structured English Immersion, specially designed academic instruction delivered in English, content-based ELL, pull-out ELL, push-in ELL, Newcomer, and extended instructional day.

	How is ELL defined and identified?	Use WIDA standards?	State approved program model?
Wyoming	"The definition of an Active EL student is a student who: ● Is newly enrolled in the district or enrolled in the district after the state annual ELP assessment, ACCESS for ELLs 2.0, was given in the prior school year; and has been identified and evaluated by the district as being an Active EL through the use of an ELP screening assessment; or ● Is returning to the district from the previous school year; and ● Took the state's annual ELP assessment in the prior school year and has not yet achieved a 'proficiency' level." Home language surveys and English language proficiency exams are used for identification.	Yes	No specific required program model; examples of EL program models that meet the requirements of Title III: two-way immersion/dual language, transitional bilingual education, ESL pullout, conten-based ESL, sheltered English instruction, structured English immersion, heritage language, specially designed academic instruction in English, and native language literacy.
Regional States (continued)			
Nebraska	"Whose difficulties in speaking, reading, writing, or understanding the English language may be sufficient to deny the individual: The ability to meet the State proficient level of achievement on State assessment described in 1111(b)(3) of No Child Left Behind; The ability to successfully achieve in classrooms where the language of instruction is English;/OR The opportunity to participate fully in society." A home language survey and English language proficiency assessment are administered by school district personnel to identify LEP students.	No	"This program, which is designed to support the LEP student in English-language acquisition, must be: A systematic approach to teaching English; A research-based approach that is supported by experts in the field of second-language acquisition; An approach that has the effect of developing the English proficiency of LEP students, enabling them to meet academic standards using the English language." Program models include newcomer program, structured immersion or sheltered instruction, ESL pull-out/ESL push-in, dual language program, and transitional bilingual.
Utah	"English Language Learner/Limited English Proficient" or "ELL/LEP" means an individual: (a) who has sufficient difficulty speaking, reading, writing, or understanding the English language, and whose difficulties may deny the individual the opportunity to: (i) learn successfully in classrooms where the language of instruction is English; or (ii) participate fully in society; (b) who was not born in the United States or whose native language is a language other than English and who comes from an environment where a language other than English is dominant; or (c) who is an American Indian or Alaskan native or who is a native resident of the outlying areas and comes from an environment where a language other than English has had a significant impact on such individual's level of English language proficiency." R277-716-2. "The Superintendent shall make available an identification and placement procedure model to LEAs to provide language acquisition services for ELL/LEP students. (2) The Superintendent shall develop and require all LEAs to use the statewide annual assessment based on the AMAOs for English language acquisition to measure growth and progress..." R277-716-3.	Yes	"The Superintendent shall make models and accountability measures in providing ALS services to students available to LEAs. (7) An LEA shall use Superintendent-identified models or models based upon educational research." R277-716-3. "Following receipt of Title III funds, an LEA shall: (a) determine what type of Title III ALS services are available and appropriate for each student identified in need of ALS services, including: (i) dual immersion; (ii) ESL content-based; and (iii) sheltered instruction;" R277-716-4.
High Performing States			
Massachusetts	"State law defines the term 'English learner' as a child who does not speak English or who is not currently able to perform ordinary classroom work in English." Home language surveys and English proficiency screening test are used for identification.	Yes	Castañeda Three-Prong Test is used to evaluate district programs: • The educational theory underlying the language assistance program is recognized as sound by some experts in the field or is considered a legitimate experimental strategy. • The program and practices used by the district are reasonably calculated to implement effectively the educational theory adopted by the district. • The program succeeds when producing results indicating that students' language barriers are actually being overcome. Some program types include sheltered English immersion program, two way immersion program, and transitional bilingual education.
Vermont	"In Vermont, the term ELL refers to those students who have not yet met the State's definition of proficiency, as measured by the State's English language proficiency assessments which are also linked to grade appropriate academic standards." Home language survey and English language proficiency assessments are used for identification.	Yes	Best practices in ELL instruction are built on a foundation of: • culturally responsive teaching and learning environments; • language and literacy instruction based on the student's stage of bilingual or multilingual language acquisition; and • sheltered content instruction planned around the student's level of proficiency in academic English. Sheltered English Instruction is one approved program model.
New Hampshire	"'LEP students' are defined as currently enrolled students who have not already reached threshold proficiency scores on the ACCESS test... Definition of Proficiency - In order to reach proficiency on the ACCESS 2.0, a student must attain a composite score of no less than 5.0." Home language surveys and proficiency assessments are used for identification.	Yes	"A School District may choose and implement one or more models for providing ESOL instruction that will meet the second language acquisition needs of its enrolled English Learners. Choices include: small group or individual pull-out program, ESOL instruction in the mainstream classroom, a self-contained (magnet) classroom for a limited period of time, and sheltered instruction in the mainstream classroom."

	How is ELL defined and identified?	Use WIDA standards?	State approved program model?
Wyoming	"The definition of an Active EL student is a student who: ● Is newly enrolled in the district or enrolled in the district after the state annual ELP assessment, ACCESS for ELLs 2.0, was given in the prior school year; and has been identified and evaluated by the district as being an Active EL through the use of an ELP screening assessment; or ● Is returning to the district from the previous school year; and ● Took the state's annual ELP assessment in the prior school year and has not yet achieved a 'proficiency' level." Home language surveys and English language proficiency exams are used for identification.	Yes	No specific required program model; examples of EL program models that meet the requirements of Title III: two-way immersion/dual language, transitional bilingual education, ESL pullout, conten-based ESL, sheltered English instruction, structured English immersion, heritage language, specially designed academic instruction in English, and native language literacy.
High Performing States (continued)			
New Jersey	"These students are defined as ELLs, above the age of seven, who: Have missed more than six consecutive months of formal schooling prior to enrolling in a U.S. school; and/or Are more than two years below grade level in content due to limited educational supports prior to enrolling in a U.S. school." Multiple indicators identification are used including home-language survey and English language proficiency test.	Yes	"Various ELS/ESL/bilingual program models including co-teaching, small-group work, and pull-out programs..."
Virginia	The state uses the federal definition of LEP student. "Designated division personnel should review registration and/or home language survey documents submitted to the school for educational information, language, and ELP assessment scores to determine the next step." "Identifying questions should be included in the enrollment process to ensure that ELLs are consistently identified. The identifying questions below are recommended by the U.S. Department of Education: What is the primary language used in the home, regardless of the language spoken by the student? What language is most often spoken by the student? What is the language the student first acquired?... School divisions may choose to use a home language survey (HLS) to determine the need for: an English language proficiency screening; and possible English as a Second Language (ESL) services."	Yes	No specific models were found, but strategies are outlined here: http://www.doe.virginia.gov/instruction/esl/resources/strategies_teach_english.pdf.
Indiana	In Indiana, English language proficiency is defined as a 5.0 overall composite score on the annual WIDA ACCESS assessment. "Indiana has established standardized statewide entrance procedures to identify and screen potential English learners based upon the accurate and timely administration of the Home Language Survey and the English language proficiency placement exam (WIDA Screener and the Kindergarten W-APT)."	Yes	"Provide English language development services (i.e. ESL, sheltered instruction, two-way immersion) above & beyond core E/LA instruction that are research based, reasonably calculated to implement the program effectively via resources and personnel, and evaluated regularly to ensure language barriers are being overcome..."

Appendix H

Gifted and Talented Requirements

Gifted and Talented Comparison

	How defined?	Mandated services?
Wyoming	“Gifted and talented students identified by professionals and other qualified individuals as having outstanding abilities, who are capable of high performance and whose abilities, talents and potential require qualitatively differentiated educational programs and services beyond those normally provided by the regular school program in order to realize their contribution to self and society.” (Wyoming Stat. Ann. § 21-9-101)	No specific mandated services.
Regional States		
Colorado	"The Exceptional Children’s Educational Act (ECEA) requires all administrative units (AUs) in Colorado to identify and serve students between the ages of five and twenty-one, and age four in administrative units with Early Access, whose aptitude or competence in abilities, talents, and potential for accomplishment in one or more domains are so exceptional or developmentally advanced that they require special provisions to meet their educational programming needs."	Not necessarily mandated services, but "the Advanced Learning Plan (ALP) is a legal document [22-20-R-12.00, C.R.S.] outlining programming for identified gifted students and is used as a guide for educational planning and decision-making."
Montana	"In the School Laws of Montana, MCAA 20-7-901, high ability/high potential students are defined as children with capabilities that 'require differentiated educational programs beyond those normally offered in public schools in order to fully achieve their potential contribution to self and society.'"	"Montana's School Accreditation Standards require each school district to provide educational services to high ability/high potential students commensurate with their needs as outlined in a comprehensive district framework for gifted education." "Montana's approach to providing educational services to high ability/high potential students involves adapting the systems through which education is normally offered; that is, many of these services can occur in a student's regular classroom, but the services must occur through planned and targeted strategies."
Idaho	"All students identified as gifted and talented in the State of Idaho have the right to an education that sustains, challenges, and ensures continued growth within the public school system. According to Idaho Code §33-2001, Gifted and Talented children demonstrate high performing capabilities in specific academic areas and require services that are not usually provided by the school. The Five Gifted and Talented Areas: Intellectual, Specific Academic, Leadership, Creativity, Visual/Performing Arts." Identification involves initial screening and appropriate placement.	"Each public school district is responsible for and shall provide for the special instructional needs of gifted/talented children enrolled therein. Public school districts in the state shall provide instruction and training for children between the ages of five (5) years and eighteen (18) years who are gifted/talented as defined in this chapter and by the State Board of Education. The State Board of Education shall, through its department of education, determine eligibility criteria and assist school districts in developing a variety of flexible approaches for instruction and training that may include administrative accommodations, curriculum modifications and special programs (Idaho Code §33-2003)."
North Dakota	"‘Student who is gifted’ means an individual who is identified by qualified professionals as being capable of high performance and who needs educational programs and services beyond those normally provided in a regular education program.” (North Dakota Cent. Code § 15.1-32-01)	The state has no mandates for programs or services, just guidelines.
South Dakota	No gifted policy in place.	No mandates.
Nebraska	“Learner with high ability means a student who gives evidence of high performance capability in such areas as intellectual, creative, or artistic capacity or in specific academic fields and who requires accelerated or differentiated curriculum programs in order to develop those capabilities fully.” (Nebraska Rev. Stat. § 79-1107)	No specific mandates, but there is guidance in legislation.
Utah	"LEAs shall have a process for identifying students whose academic achievement is accelerated based upon multiple assessment instruments." Utah Administrative Rule R277-707-3B. "This new rule defines “accelerated” students as “children and youth whose superior academic performance or potential for accomplishment requires a differentiated and challenging instructional model that may include: Advanced Placement courses (AP), Gifted and talented programs, International Baccalaureate programs (IB), Concurrent Enrollment."	Not mandated. "The responsibility for the development and implementation of gifted and talented programs rests with each school district (LEA) however, Utah Administrative Rule 277-707 is not a mandate for gifted and talented programming. All LEAs are eligible to apply for the Enhancement for Accelerated Students Program funds through the UCA"

	How defined?	Mandated services?
Wyoming	"Gifted and talented students identified by professionals and other qualified individuals as having outstanding abilities, who are capable of high performance and whose abilities, talents and potential require qualitatively differentiated educational programs and services beyond those normally provided by the regular school program in order to realize their contribution to self and society." (Wyoming Stat. Ann. § 21-9-101)	No specific mandated services.
High Performing States		
Massachusetts	The state loosely defines "academically advanced" throughout the study to refer to students who have achieved beyond the norm either on standardized assessments, or in classroom work, or in both areas.	No mandates.
Vermont	"'Gifted and talented children' means children identified by professionally qualified persons who, when compared to others of their age, experience, or environment, exhibit capability of high performance in intellectual, creative, or artistic areas, possess an unusual capacity for leadership, or excel in specific academic fields." 16 V.S.A. § 13	No mandates.
New Hampshire	"In New Hampshire, there is no state-level legislation or regulation regarding gifted education."	No mandates.
New Jersey	""Gifted and talented students" means students who possess or demonstrate high levels of ability in one or more content areas when compared to their chronological peers in the local school district and who require modifications of their educational program if they are to achieve in accordance with their capabilities." N.J.A.C. 6A:8-1.3	"District boards of education shall be responsible for identifying gifted and talented students and shall provide them with appropriate instructional adaptations and services." N.J.A.C. 6A:8-3.1(a)(5)
Virginia	"Gifted students" means those students in public elementary, middle, and secondary schools beginning with kindergarten through twelfth grade who demonstrate high levels of accomplishment or who show the potential for higher levels of accomplishment when compared to others of the same age, experience, or environment. Their aptitudes and potential for accomplishment are so outstanding that they require special programs to meet their educational needs. These students will be identified by professionally qualified persons through the use of multiple criteria as having potential or demonstrated aptitudes in one or more of the following areas: general intellectual aptitude, specific academic aptitude, career and technical aptitude, and visual or performing arts aptitude. 8VAC20-40-20	"If a student is identified as gifted and eligible for services, the identification and placement committee shall determine which service options most effectively meet the assessed learning needs of the student. Identified gifted students shall be offered placement in an instructional setting that provides: 1. Appropriately differentiated curriculum and instruction provided by professional instructional personnel trained to work with gifted students; and 2. Monitored and assessed student outcomes that are reported to the parents and legal guardians." 8VAC20-40-20
Indiana	"The Indiana Code defines a student with high abilities as one who: Performs at, or shows the potential for performing at, an outstanding level of accomplishment in at least one domain when compared to other students of the same age, experience, or environment; and: Is characterized by exceptional gifts, talents, motivation, or interests." (IC 20-36-1-3).	"Effective July 1, 2007, Indiana schools shall identify students with high ability in the general intellectual and specific academic domains and provide them with appropriately differentiated curriculum and instruction in core content areas, K-12." (refer to IC- 20-36-2-2).

Appendix I

Small Schools and Isolation Policies

Appendix I
Table I1
State Policies for Small School Funding

		Small School Funding Details			
	Small School Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
Alaska	**Yes**	Schools with 1,022 students or fewer	No requirements	No requirements	The state calculates funding based on school building. Any school with fewer than 1,022 students receives a bonus in their student count. As the school's population grows smaller, the bonus increases.
Arizona	**Yes**	Districts with fewer than 600 students	Contains at least one school that is fewer than **30** miles by the most reasonable route from another school that teaches one or more of the same grades and is operated by another school district in this state.	Must meet size and distance requirements and be designated by the superintendent of public education.	Based on a sliding scale: K-8 Schools: 99 or fewer students (1.399), 100-499 (1.278), 500-599 (1.158). 9-12 schools: 99 or fewer students (1.559), 100-499 (1.398), 500-599 (1.268).
Arkansas	**No**				
California - Elementary	**No**				

		Small School Funding Details			
	Small School Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
California - Secondary	**No**				
Colorado	**Yes**	Districts with fewer than 5,000 students receive additional funding under the formula: - Less than 276 students 1.5457 + (0.00376159 x the difference between the funded pupil count and 276) - 276 or more but less 01.2385 + (0.00167869 x the difference than 459 between the funded pupil count and 459) 459 or more but less 1.1215 + (0.00020599 x the difference than 1,027 between the funded pupil count and 1,027) 1,027 or more but less 1.0533 + (0.00005387 x the difference than 2,293 between the funded pupil count and 2,293)	None	None	Note: Districts with fewer than 500 students receive additional funding if they have lost students to charter schools.

		Small School Funding Details			
	Small School Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
		2,293 or more but less 1.0368 + (0.00001367 x the difference than 3,500 between the funded pupil count and 3,500) 3,500 or more but less 1.0297 + (0.00000473 x the difference than 5,000 between the funded pupil count and 5,000) 5,000 or more 1.0297.			
Florida	**No**				
Georgia	**No**				
Hawaii	**No**				
Idaho	**No**				

		Small School Funding Details			
	Small School Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
Kansas	**Yes**	District with fewer than 1,622 students	No requirements	No requirements	The weighting is calculated on a linear transition: districts with 100 or fewer students receive a weighting of approximately 101.4% of the enrollment of the district, and that amount transitions to approximately 3.5% of the enrollment of the district as the enrollment approaches 1,622 students.
Louisiana	**Yes**	District with fewer than 7,500 students	No requirements	No requirements	The Economy of Scale Weight is calculated as a curvilinear weight of 20% at a student membership count of zero down to 0% at a student membership count equal to or greater than 7,500.
Maine	**No**				
Michigan	**Yes**	No requirements	7.3 or fewer pupils per square mile in the district	A district that receives isolation funding cannot receive this funding.	Funding is provided on a prorated per-pupil basis. In 2017-18, the state allocated $4,042,700 to this program.
Minnesota	**No**				

	Small School Funding Details				
	Small School Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
Missouri	**Yes**	Schools with fewer than 350 students	No requirements	No requirements	In the 2017-18 school year, the state has a $10,000,000 grant program for small schools. $5 million is distributed to small schools (350 students or less) on a per-pupil basis (Estimated amount of $277 per student). The other $5 million is distributed to districts with fewer than 350 students who also levee a minimum property tax.
Montana	**No**	No requirements	No requirements	No requirements	The state does not provide small/isolated districts with additional funding, but if an elementary school has less than 10 students or a high school has fewer than 25, then the district needs to apply for designation as an isolated district (MCA 20-9-302). If they don't receive designation as an isolated district, then they will be forced to fund their elementary schools with a higher amount of local funding. (MCA 20-9-303).
Nebraska	**Yes**	District with fewer than 900 students	No requirements	No requirements	The base funding amount for each district is determined through a review of the previous year expenditures for the 5 next smallest districts and the 5 next largest districts. Districts with fewer than 900 students have a base amount based on the same comparison but they are allowed to eliminate the two highest and lowest spending districts.

		Small School Funding Details			
	Small School Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
New Mexico	**Yes**	Four programs: 1) Schools with less than 400 students, 2) Districts w/ less than 4,000 students, 3) Districts with greater than 10,000 students that have fewer than 4,000 high school students, and 4) schools with less than 200 students that have been certified by the state.	No requirements	No requirements	Each of the four types of small/isolated schools have different formulas that generate additional funding. The funding formulas are based on district or school size.
New York	**Yes**	School – seven or fewer teachers	No requirements	No requirements	State law: Title 5 - Article 73 - Part 1 - 3602-b - however this section of the law appears to be outdated.
North Carolina	**Yes**	Districts that have 3,200 or fewer students	No requirements	No requirements	Districts receive funding based on their size. During the 2016-17 school year, districts received between \$1.71 million (districts 600 or below) to \$1.47 million (2,301 to 2,600 students).
North Dakota	**No**				

		Small School Funding Details			
	Small School Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
Oklahoma	**Yes**	District with fewer than 529 students	No requirements	The state also provides grants to districts with fewer than 800 students to help them establish cooperative agreements to create efficiencies.	State formula: 529 minus the average daily membership divided by 529 times .2 times total average daily membership.
Oregon	**No**				
South Dakota	**Yes**	District with fewer than 600 students	No requirements	No requirements	State funding is based on teaching positions. Districts under 200 students have a teacher to student ratio in the formula of 12. Districts with over 200 but under 600 have a student teacher ratio of between 12 and 15. Districts with more than 600 students have a ratio of 15.
Texas	**Yes**	Two programs – one for districts of 1,600 students or less and one for 5,000 students or less	No requirements	No requirements	Districts of 5,000 students or less receive the following funding: Per-pupil funding = (1 + ((5,000 - student count) X .000025)) X adjusted basic allotment. Districts of 1,600 students or less receive the following funding: Per-pupil funding = (1 + ((1,600 - student count) X .00025)) X adjusted basic allotment
Utah	**No**				

		Small School Funding Details			
	Small School Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
Vermont	**Yes**	Schools with fewer than 100 students or an average class size of 20 or fewer.	No requirements currently. There will be a geographic requirement starting in 2019-20 school year.	No requirements	The greater of: (1) the amount determined by multiplying average enrollment by $500.00 and subtracting the product from $50,000.00, with a maximum grant of $2,500.00 per enrolled student; or (2) the amount of 87% of the base education amount for the current year, multiplied by the two-year average enrollment, multiplied by the AGS factor.
Washington	**Yes**	Elementary schools with enrollment of fewer than 100 students. Districts with two or fewer high schools with a total secondary population of less than 300.	No requirements	No requirements	Additional funding for different schools based on grades educated and student enrollment. See state budget page 147.
West Virginia	**Yes**	No requirements	Districts receive minimum funding from the state based on their relative sparsity. There are four groups: Sparse-Density: Less than 5 students/sq. mile, Low-density: between 5 and less than 10 students/sq. mile, Medium-density: Between 10 and less than 20 students/sq. mile and High-density: 20 or more	No requirements	Minimum funding is provided. See state law: 18-9A-2 (j) through (m)

		Small School Funding Details			
	Small School Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
			students/sq. mile		
Wisconsin	**No**				
Wyoming	**Yes**	A school with 49 or fewer students. A district with fewer than 243 students. If all of the schools in a district have 49 or fewer students then both the schools and the district receive additional funding.	No requirements	No requirements	Additional funding is provided to both small schools and small districts through the state's resource model.

Appendix I
Table I2
State Policies for Isolated School Funding

		Isolated School Funding Details			
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
Alaska	**No**				
Arizona	**Yes**	Districts with fewer than 600 students	Contains no school that is fewer than **30 miles** by the most reasonable route from another school, or, if road conditions and terrain make the driving slow or hazardous, **15** miles from another school that teaches one or more of the same grades and is operated by another school district in this state.	Must meet size and distance requirements and be designated by the superintendent of public education.	Based on a sliding scale: K-8 Schools - 99 or fewer students (1.559), 100-499 (1.358), 500-599 (1.158). 9-12 schools - 99 or fewer students (1.669), 100-499 (1.468), 500-599 (1.268).
Arkansas	**Yes**	A school with fewer than 350 students	**(1)** There is a distance of 12 miles or more by hard-surfaced highway from the high school of the district to the nearest adjacent high school in an adjoining district; (2) The density ratio of transported students is less than 3 students per square mile of	A district must have fewer than 350 students and meet at least 4 of the 5 transportation requirements.	All districts that qualify receive Categories 1 funding - ((350-ADM)/850) x ADM) x foundation amount. If districts have below 1.2 students per sq. mile they also receive Cat. 2 funding which is an additional 50% above their Cat. 1 funding.

		Isolated School Funding Details			
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
			area; (3) The total area of the district is 95 sq. mi. or greater; (4) Less than 50% of bus route miles is on hard-surfaced roads; and (5) There are geographic barriers such as lakes, rivers, and mountain ranges that would impede travel to schools that otherwise would be appropriate for consolidation, cooperative programs, and shared services.		
California – Elementary	**Yes**	The district must have fewer than 2,501 students. An elementary school (K-8) with less than 97 students.	(1) If as many as 5 pupils have to travel more than 10 miles one way from a point on a well-traveled road nearest their home to the nearest other public elementary school. (2) If as many as 15 pupils to have to travel more than five miles one way from a point on a well-traveled road nearest their home to the nearest other public elementary school. (3) If topographical or other conditions exist in a school	A school must meet both the size requirement and at least one of the travel requirements.	•School 25 or less w/ 1 teacher: $52,952. •School 25 to 48 pupils w/2 teachers: $105,850 •School 49 to 72 pupils w/3 teachers: $158,775 •School 73 to 96 pupils w/4 teachers: $211,700.

	Isolated School Funding Details				
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
			district that would impose unusual hardships if the number of miles specified in paragraph (1) or (2) were required to be traveled, or if during the fiscal year the roads that would be traveled have been impassable.		
California – Secondary	**Yes**	The district must have fewer than 2,501 students. High school with less than 287 students.	(A) The high school with 96 pupils that is more than 15 miles to the nearest other public high school and either 90% of the pupils would be required to travel 20 miles or 25% of the pupils would be required to travel 30 miles one way. (B) Between 96 and 143 pupils and is more than 10 miles from the nearest public high school and either 90% of the pupils would be required to travel 18 miles or 25% of the pupils would be required to travel 25 miles one way. (C) Between 144 and 191 pupils and is more than 7.5 miles from the nearest	A school must meet both the size requirement and at least one of the travel requirements.	Ranges between $124,250 (1 teacher 19 or few students) to $2,043,300 (286 or few students and 15 or more teachers) For greater detail see: http://www.cde.ca.gov/fg/aa/pa/pa1718rates.asp

	Isolated School Funding Details				
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
			public high school and either 90% of the pupils would be required to travel 15 miles or 25% of the pupils would be required to travel 20 miles one way. (D) Between 192 and 286 pupils and is more than 5 miles from the nearest public high school and either 90% of the pupils would be required to travel 10 miles or 25% of the pupils would be required to travel 15 miles to the nearest other public high school. Or topographical or other conditions exist that would impose unusual hardships on the number of miles traveled.		
Colorado	**No**				

		Isolated School Funding Details			
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
Florida	**Yes**	Elementary: Must contain grades K-5 (Can contain 6, 7, or 8) 28 to 100 students – 75% of which qualify for F/R Lunch. High School: 28 to 100 students.	Elementary school that is 35 miles from nearest school. High school that is 28 miles from nearest school.	A school must meet both the size and travel requirements.	An isolated district can multiply their unweighted full-time equivalent students by 2.75.
Georgia	**Yes**	Elementary: below 450 students. Middle School: below 624 students and High School below 485 students.	The state must determine that the school/district cannot be consolidated with another school/district.		The funding is provided as a grant; In the 2017-18 school year, state funding for this grant amount totaled $5,680,692.
Hawaii	**No**				The state did have isolated funding that provided an additional 5% per student to schools. However, the program was discontinued in the 2011-12 school year.
Idaho	**Yes**	See "Other"	See "Other"	State law does allow districts to apply for additional "isolation funding" but it does not put any parameters on what an isolated school is.	Not defined.
Kansas	**No**				

		Isolated School Funding Details			
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
Louisiana	**No**				
Maine	**Yes**	K-8 Schools: 14 or fewer students per grade Non-K-8: 28 or fewer students per grade Secondary school: Fewer than 200 students per school	For all primary schools – nearest school is more than 8 miles away. For secondary schools from furthest point in the district to nearest high school is at least 18.5 miles and nearest high school is more than 10 miles away.	School must meet both size and travel requirements or be an island school to qualify for funding.	Districts with qualifying schools receive a 10% adjustment their state funding. For qualifying secondary schools, the student teacher ratios are reduced to 11:1 for schools with fewer than 100 students and to 13:1 for schools with between 100 and 199 students. For Island schools operating on the island there is a 13-26% adjustment to EPS operating and maintenance costs based on the size and level of the school
Michigan	**Yes**	Districts must have fewer than 250 pupils	Each school in the district meets at least one of the following: Is located in the Upper Peninsula at least 30 miles from any other public school building, or is located on an island that is not accessible by bridge.		In FY 2017-18, $957,300 was budgeted for this program. "The amount of the additional funding to each eligible district under subsection (2) shall be determined under a spending plan developed as provided in this subsection and approved by the superintendent of public instruction. The spending plan shall be developed cooperatively by the intermediate superintendents of each intermediate district in which an eligible district is located."
Minnesota	**Yes**	Primary schools: 20 or fewer students per grade. Secondary schools - fewer than 400 students	Primary school – be located 19 miles or more from nearest school. Secondary school – sparsity		Primary school funding is based on the number of students in the district multiplied by a sparsity formula. Secondary school funding is based on number of students and

		Isolated School Funding Details			
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
			ratio based on district size & miles to nearest high school (square root of: .55 times district. size in miles plus miles to nearest school).		a districts sparsity index (See page 19 for calculation: http://www.house.leg.state.mn.us/fiscal/files/16fined.pdf)
Missouri	**No**				
Montana	**Yes**	None stated	A school is more than 20 miles from an incorporated town or from another school of the district, or the state superintendent determines that the schools has an unusual transportation hardship due to geography or some other transportation issue.	Must meet the mandates and be receive isolated designation from the state superintendent	If a school is designated as isolated then its student count is calculated separately from the other schools of the district and thus the district "receives" an additional basic entitlement.
Nebraska	**No**				
New Mexico	**No**				

	Isolated School Funding Details				
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
New York	**Yes**	None stated	Fewer than 21 students per square mile.	No requirements	Increase in the student count based on the following formula: (21 - students/square mile)/317.88
North Carolina	**No**				
North Dakota	**No**				The state had a program for isolation funding but began to phase the program out beginning in the 2014-15 fiscal year. The program is now fully phased out.
Oklahoma	**Yes**	None stated	A district can achieve this status because of "unusual hardship" related to geography/transportation	Districts receive either the small school funding amount or the isolated amount whichever is higher.	See page 37 for full description: http://sde.ok.gov/sde/sites/ok.gov.sde/files/TechAsstDoc.pdf
Oregon	**Yes**	Elementary schools: 28 students or fewer per grade. High schools: Districts has less than 8,500 students and a 4-grade school has below 350 students or a 3-grade school has below 267 students.	For an elementary school to qualify it must be at least 8 miles away from the next nearest elementary school or there has to be a geographic barrier between it and the next nearest schools. High schools have no distance requirement.	Elementary schools must have at least 25 students to qualify and high schools must have at least 60 students.	Districts receive additional funding based on the size of qualifying schools.

	Isolated School Funding Details				
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
South Dakota	**No**				
Texas	**Yes**	Districts with 1,600 students and smaller	At least 300 square miles in size.	To receive this isolation funding a district must meet both the size and geographic requirements.	Districts that qualify receive the following funding: Per pupil funding = (1 + ((1,600 - student count) X .0004)) X adjusted basic allotment
Utah	**Yes**	Size limit to qualify: Elementary schools: 160 students. Secondary schools: One or two-year schools - 300 students, 3-year schools - 450 students, 4-year schools - 550 students, 6-year schools - 600 students.	Students in grades K-6: travel of more than 45 minutes to school. Students in grades 7-12: travel of more than 1 hour and 15 minutes to school.	In order for a school to qualify for necessarily existent status, the school district must apply to the State Board of Education on behalf of the school.	Funding is allocated to a school district with qualifying schools on a "weighted pupil unit" (WPU) basis. Program WPUs are determined by "a regression formula based on prior year ADM and school grade span"
Vermont	**No**				
Washington	**Yes**	Determined by the state superintendent	Determined by the state superintendent	No requirements	Additional funding for different schools based on grades educated and student enrollment. See state budget page 147.

		Isolated School Funding Details			
	Isolated Funding	**Enrollment Qualifications**	**Geographic Qualifications**	**Other**	**Funding**
West Virginia	**Yes**	District with 1,400 or fewer students	District density (students per square mile) are factored into funding allocation.	No requirements	Additional funding is provided to districts with 1,400 or fewer students based on their relative student density.
Wisconsin	**Yes**	District with 745 or fewer students	Less than 10 students per square mile	No requirements	$300 per student
Wyoming	**No**				

Sources of State Policies on Small School and Isolated School Funding

	Sources
Alaska	Alaska state law: 14.17.450: http://codes.findlaw.com/ak/title-14-education-libraries-and-museums/ak-st-sect-14-17-450.html
Arizona	http://www.azleg.gov/viewdocument/?docName=http://www.azleg.gov/ars/15/00943.htm State write-up: https://www.azed.gov/finance/files/2011/12/equalization-formula-funding.pdf State definition: http://www.azleg.gov/ars/15/00901.htm
Arkansas	State law: § 6-20-601
California - Elementary	State Education Law: § 42282
California - Secondary	State Education Law: § 42285
Colorado	C.R.S. 22-54-104(I.5)
Florida	State law: 1011.62(1)(h) http://www.fldoe.org/core/fileparse.php/7507/urlt/Fefpdist.pdf
Georgia	Georgia Code: 20-2-292 and State administrative rules: 160-5-4-.14
Hawaii	
Idaho	State law: Chapter 10, Section 33-1003(3). State isolated funding form: https://www.sde.idaho.gov/finance/files/general/other/Remote-Schools-Petition.pdf
Kansas	State legislative publication: http://www.kslegislature.org/li/b2017_18/measures/documents/summary_sb_19_2017.pdf
Louisiana	State publication: https://www.louisianabelieves.com/docs/default-source/minimum-foundation-program/proposed-fy2016-17-mfp-resolution---submitted-to-legislature-march-15-2016.pdf?sfvrsn=2
Maine	State Law: Title 20 - Part 7 - Chapter 606-B, 15683 (E). State pub (page 14): https://www1.maine.gov/education/data/eps/ED279linebyline.pdf

	Sources
Michigan	State law: 388.1622d. http://www.legislature.mi.gov/(S(kfbh5vgwnku10lrytd1ybl5c))/mileg.aspx?page=getObject&objectName=mcl-388-1622d-amended
Minnesota	State school funding publication: http://www.house.leg.state.mn.us/fiscal/files/16fined.pdf
Missouri	https://dese.mo.gov/sites/default/files/finance/memos/documents/sf-June2017.pdf page 3
Montana	Montana state law: 20-9-311(b)(8)(a)(i). http://leg.mt.gov/bills/mca/20/9/20-9-311.htm
Nebraska	Nebraska Revised Statute: 79-1007.16.3
New Mexico	State law: Chapter 22 - Article 8 - Sect. 22-8-23. State write-up: https://www.nmlegis.gov/lcs/lesc/lescdocs/briefs/July2011/Item%203a%20-SM%2070,%20Rural%20Isolation%20Units%20Study%20%20(July%202011).pdf
New York	State description (Pages 32 & 45): https://www.budget.ny.gov/pubs/executive/eBudget1718/fy18localities/schoolaid/1718schoolaid.pdf
North Carolina	State publication (page 12): http://www.ncleg.net/documentsites/committees/JLEOC/Reports%20Received/2016%20Reports%20Received/Low%20Wealth%20and%20Small%20School%20Supplemental%20Funding_2016.pdf
North Dakota	http://www.legis.nd.gov/cencode/t15-1c27.pdf#nameddest=15p1-27-15 (Section 15.1 – 27 – 15.1)
Oklahoma	State law: Section 70-18-201.1(B)(3)(a)
Oregon	State law: Volume 9 - 327.077 https://www.oregonlegislature.gov/bills_laws/ors/ors327.html
South Dakota	State law: Section 13-13-10.1(2C) http://sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=13-13-10.1
Texas	Texas Education Code: § 42.103 http://codes.findlaw.com/tx/education-code/educ-sect-42-103.html

	Sources
Utah	State legislature publication: https://le.utah.gov/lfa/reports/cobi2015/Appr_PPC.htm
Vermont	State law: T16 V.S.A. § 4015. http://legislature.vermont.gov/statutes/section/16/133/04015
Washington	State budget (Page 147): http://leap.leg.wa.gov/leap/Budget/Detail/2015/6052-S.PL.pdf. State law: WAC 392-349-015. http://apps.leg.wa.gov/wac/default.aspx?cite=392-349-015
West Virginia	State law: 18-9A-2(i)(5) http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=18&art=9A#09A
Wisconsin	State publication: https://dpi.wi.gov/sfs/aid/categorical/sparsity-aid-program
Wyoming	State summary of the school funding system: https://edu.wyoming.gov/downloads/schools/wyoming-funding-model-guidebook.pdf. https://edu.wyoming.gov/downloads/schools/2013-03-01schoolfoundationblockgrantflowchart.pdf

Supplemental Report B

Equity Study of Current Funding Model

Prepared for the

Select Committee on School Finance Recalibration

By

Augenblick, Palaich and Associates

Final, January 12, 2018

Contents

I. Introduction

This report presents the results of APA's equity analysis of Wyoming's school finance system. As a school finance term, "equity" refers to how resources are allocated across school districts and, ultimately, across schools and students. The most common notion of equity assumes that a school finance system that distributes resources *equally* is equitable. However, both research and APA's experience working in other states have shown that school systems vary in their numbers of special needs students (e.g. at-risk students, English language learner (ELL) students, and special education students), who require higher levels of resources to achieve the same, or similar outcomes, as general population students. Thus, to achieve outcomes that are equitable, or comparable to, outcomes for general population students, special needs students require higher amounts of resources. Furthermore, local school districts differ in their abilities to raise revenues locally. Disparities in local property and income wealth mean some school districts may be able to raise significantly higher local revenues than other districts. Some districts also face factors beyond their control that can lead to higher operating costs. For example, districts may have small student enrollments or low population density. A strong finance system that is truly equitable will accommodate for differences between districts in terms of: (1) student resource needs, (2) district characteristics, and (3) district revenue-raising abilities.

This equity analysis makes use of generally accepted statistical methods used in studies across the country to assess the equity of states' school finance systems. The analysis examined the fiscal equity of Wyoming's school finance system for fiscal year 2015-16, the most recent year for which all of the needed data were available. The Wyoming Department of Education provided all of the data used in this analysis, including datasets of district revenues; expenditures; taxable values; student counts and demographics; and teacher counts, characteristics, and salaries.

The remaining sections of this report:

1. define key terms;
2. provide a definition of school finance equity;
3. provide a brief description of the Wyoming school finance context;
4. describe key school district characteristics;
5. present the results of the horizontal equity, vertical equity, and fiscal neutrality analyses; and
6. present the key findings of the equity study.

Defining Terms and Data Elements Used in this Report

The definition of several terms and measures of district revenues and expenditures used throughout this report are provided below.

- **Need Factor.** The need factor is a measure used by APA to compare the level of student need across districts. Districts with high need factors serve higher concentrations of students with special needs than districts with low need factors. To calculate the need factor, APA used student weights for at-risk, ELL, and special education students. These weights were determined on the basis of work APA has done around the country examining the additional costs special needs students create for districts. For this study, at-risk students were assigned a weight of 0.4, ELL students a weight of 0.7, and special education students a weight of 1.1. The average daily membership (ADM) count for each of these special need categories in each district was multiplied by the appropriate weight to create a weighted ADM (WADM). This weighted ADM count is then divided by the actual ADM to determine the need factor. For example, if District A has 2,000 total students, 200 special education students, 800 at-risk students, and 60 ELL students, then its need factor calculation is: 2,000 total students + (200 special education students x 1.1) + (800 at-risk students x 0.4) + (60 ELL students x 0.7))/2,000 total students = 1.29 need factor.

- **Weighted ADM (WADM).** Weighted ADM is a district's ADM count adjusted by the weights described above to account for the number of students with special needs in the district.
- **General Fund Operating Revenue.** Consists of general fund revenues from state, county, and local sources (excluding levies for capital maintenance, adult education, BOCES, and parks and recreation levies). It also excludes transportation fees, bond and interest revenues, food service revenues, and 8,500 other revenues.
- **General + Special Revenue Fund Operating Revenues.** Consists of the general fund revenues from above and special revenue funds from state, county, local, and federal sources (excluding major maintenance and 8,500 other revenues).
- **General Fund Expenditures.** Consists of general fund expenditures (excluding transportation, food service, debt service, facilities major maintenance and services, and fund transfers).
- **General + Special Revenue Fund Expenditures.** Consists of the general fund expenditures from above plus special revenue fund expenditures (excluding transportation, food service, debt service, facilities major maintenance and services, and fund transfers).
- **Expenditures for Instruction.** Includes expenditures for general and special instruction services.

Defining Equity

There are two key concepts involved in the assessment of state school finance systems. The first is fiscal adequacy, or the extent to which the finance system provides the resources necessary for districts, schools, and students to achieve state performance expectations. Studies of adequacy attempt to answer the question of how much is enough. The second concept is fiscal equity. Equity addresses the question of how equitably the finance system distributes resources to districts and ultimately to students.

School finance equity has been discussed and analyzed both in terms of the focus on whom or what is being treated equitably, and the particular type of equity of interest. Most often, equity studies focus on the distribution of resources to school districts, since nearly every state calculates its state school finance formula at the district level. While equity at the school level is also of concern, resource allocations to individual schools are, in nearly all cases, the result of local school board policies and procedures. However, it is also reasonable to be concerned about how equitably resources are ultimately directed toward schools and individual students. Are resources being allocated fairly to schools within districts? Are more resources being targeted toward students with greater educational needs? Taxpayers comprise another legitimate focus of equity. Are some taxpayers subject to much higher tax rates solely because they live in a school district with little wealth? Do other taxpayers enjoy the ability to raise much higher levels of revenues at lower tax efforts because they live in wealthier communities?

There are also multiple equity concepts that are typically addressed in school finance equity analyses. The most common equity concepts are horizontal equity, vertical equity, and fiscal neutrality (Berne & Stiefel, 1984). These concepts are described below.

Horizontal equity is concerned with how equally resources are allocated to districts or students in similar situations. It is sometimes said that horizontal equity addresses the “equal treatment of equals.” In other words, an equitable school finance system will provide a roughly equal amount of resources to students with similar educational needs. Under a school finance system with high horizontal equity, students with no special needs are funded roughly equally, regardless of which school district they attend.

Vertical equity measures how well school finance systems take into account varying student and district needs. A system with high vertical equity will provide more resources for students with greater educational needs or districts with characteristics that impact costs, such as very small size or geographical isolation. In this way, a system with high vertical equity provides additional resources for supporting the programs and interventions that are required for students with greater educational needs to succeed in school. It also incorporates mechanisms for providing resources to offset the effects of characteristics that influence costs that are outside the control of districts.

Fiscal neutrality assesses the link between local wealth and the amount of revenue available to support a school district. A touchstone of school finance theory asserts that there should be little or no relationship between local wealth, such as the local property tax base, and the amount of resources available to a local school district. A school finance system with high fiscal neutrality minimizes the relationship between local wealth, or capacity, and district spending.

These three dimensions of school finance are the focus of APA’s analysis of school finance equity in Wyoming.

State Context

Decisions by Wyoming's courts[1] have led, over time, to a state school finance system that is in several ways structured to promote equity, particularly in terms of fiscal neutrality. The state established several standardized mill levies for funding schools that apply to all 48 school districts. Local districts have little authority to levy other local property taxes beyond those required by the state. Local districts are not allowed to authorize additional override mill levies for operating costs (which often lead to inequities in other states), and the state's School Facilities Commission pays for most facility construction costs using state resources (local bond issues are only needed in cases where districts choose to add enhancements beyond state school facility standards). In addition to the required mill levies, districts, or the counties in which they are located, may assess certain limited, voluntary levies for specific purposes, such as supporting a BOCES.

Wyoming's education funding model also includes elements that typically support equity when appropriately designed. These elements include additional funding for supporting students with special needs, including at-risk students, ELL students, and students with disabilities. The state fully reimburses all approved special education costs. A regional cost adjustment is used to compensate for areas with higher than average costs of living, and several mechanisms establish minimum resources for small schools and districts.

School District Characteristics

The State of Wyoming's 48 school districts are the seventh fewest among the states (Snyder, de Brey, & Dillow, 2016)[2]. The districts vary considerably in terms of enrollment size, measured here by the average daily membership, or ADM, count. In 2015-16, the state's smallest district, Sheridan County School District #3, enrolled 89.7 ADM, while its largest district, Laramie County School District #1, enrolled 13,825.1 ADM. Seven of the state's districts have enrollments of fewer than 300 ADM and 11 have fewer than 500 ADM. The state also has a large number of very small schools, some with enrollment in the single digits. Because the state education funding model includes several mechanisms for adjusting funding for small districts and schools, enrollment size is a significant consideration when analyzing and understanding the equity of the funding system.

Table 1.1 presents summary information on a number of key district and school finance characteristics. As noted above, district ADM counts range from 89.7 to 13,736.0 ADM, with an average district ADM of 1,931.9. Student need, as measured by the need factor, varies from 1.21 to 1.76, with a state average of 1.34. The 12 districts in the highest need quartile, those with need factors exceeding 1.37, have an average need factor of 1.45. Only three districts, all located in Fremont County, have a need factor of 1.50 or higher.

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[1] See, for example, *Washakie County School District Number One v. Herschler*, 606 P.2d 310 (Wyo. 1980) and *Campbell County School District v. State,* 907 P.2d 1238 (Wyo. 1995).

[2] The states with fewer districts are Hawaii (which has one statewide district), Nevada (18), Delaware (19), Maryland (24), Rhode Island (32), and Utah (41).

There is a large range in general fund operating revenues per ADM. Average general fund revenues total $15,728 per ADM. However, these amounts range from a minimum of $14,039 per ADM to $42,980 per ADM. A similar wide range exists when revenues from the special revenue fund are added. These amounts range from $15,165 per ADM to $43,854 per ADM.

A similar range of values is also found for per ADM general fund and general fund plus special revenue fund expenditures. Expenditures per ADM from the general fund range from $12,776 to $34,944, with an average of $14,424. Adding special revenue fund expenditures increases the average by just under $1,400 to $15,817 per ADM, with a range of $13,890 to $35,212.

The total taxable value per ADM, the most commonly used measure of local school district fiscal capacity, ranges from $11,160 in Fremont County School District #38 to nearly $3.1 million in Sublette County School District #1. Two other districts, Park County School District #16 and Sublette County School District #9, have a taxable value per ADM exceeding $1.0 million. Only two districts other than Fremont #38 have taxable values per ADM of less than $50,000, Fremont #14 and Fremont #21. The average for the state is $280,992 per ADM.

There are several other measures that may be used to provide some indication of the equity in program quality across districts. These include two measures often associated with teacher quality: the average teacher years of experience in a district and the percentage of teachers with advanced degrees. Two other measures include average teacher salaries and the number of teachers per 1,000 ADM (a measure of the number of students per teacher in the district). This is not the same as class size because the teacher count used includes non-regular classroom teachers, such as tutors, ELL teachers, Title I teachers, etc. There is a large range among districts for all of these measures. The average years of experience in the highest district (18.9 years) is more than double that of the lowest district (8.8 years). The average across all districts is 12.8 years. There is a larger range in the percent of teachers with advanced degrees, ranging from 17.6 percent to 68.3 percent. The state average is just under 50 percent. Average teacher salaries range from $51,236 to $70,275, while the number of teachers per 1,000 ADM ranges from 73.5 to 181.6. This means that the district at the top of the range has more than twice as many teachers to serve the same number of students as the district at the bottom of the range.

Table 1.1
Key School District Enrollment and Fiscal Characteristics: FY 2015-16

Variable	Minimum	Maximum	Range	Mean	Median
ADM	89.7	13,825.7	13,736.0	1,931.9	959.3
Weighted ADM	115.3	18,543.9	8,428.6	2,584.9	1,211.7
Need Factor	1.21	1.76	0.55	1.34	1.33
General Fund Operating Revenue Per ADM	$14,039	$42,980	$28,941	$15,728	$16,871
General Fund Operating Revenue Per Weighted ADM	$10,202	$33,440	$23,238	$11,755	$12,879
General + Special Revenue Fund Operating Revenues Per ADM	$15,165	$43,854	$28,689	$17,400	$18,345

Variable	Minimum	Maximum	Range	Mean	Median
General + Special Revenue Fund Operating Revenues Per Weighted ADM	$11,021	$34,120	$23,099	$13,005	$13,790
General Fund Expenditures Per ADM	$12,776	$34,944	$22,168	$14,424	$15,241
General Fund Expenditures Per Weighted ADM	$9,371	$27,188	$17,817	$10,781	$11,561
General + Special Revenue Fund Expenditures Per ADM	$13,890	$35,212	$21,322	$15,817	$16,808
General + Special Revenue Fund Expenditures Per Weighted ADM	$10,365	$27,396	$17,031	$11,822	$12,532
General Fund Expenditures for Instruction Per ADM	$7,323	$17,268	$9,945	$8,874	$9,019
General Fund Expenditures for Instruction Per Weighted ADM	$5,322	$13,436	$8,114	$2,020	$6,860
General + Special Revenue Fund Expenditures for Instruction Per ADM	$7,694	$17,524	$9,830	$9,727	$10,274
General + Special Revenue Fund Expenditures for Instruction Per Weighted ADM	$6,179	$14,171	$7,992	$7,270	$7,726
Average Teacher Salary	$51,236	$70,275	$19,040	$60,339	$58,355
Average Teacher Years of Experience	8.8	18.9	10.1	12.8	13.3
Average Percentage of Teachers with MA or Greater	17.6%	68.3%	50.7%	49.7%	43.2%
Teachers Per 1,000 ADM	73.5	181.6	108.1	85.1	93.4
Total Taxable Value Per ADM	$11,160	$3,070,663	$3,059,503	$280,992	$170,233

For most of the measures discussed here, the wide range in values is explained in large part by the number of very small districts and schools in the state and the way in which the funding model adjusts resources to compensate for these small sizes. The funding model incorporates minimum staffing levels for both small schools and small districts. Small schools (those with 49 or fewer ADM) are allocated minimum staffing of 1.0 full-time equivalent (FTE) teacher for every seven students and a 1.0 FTE assistant principal.

Similarly, the funding model provides minimum staffing levels for the smallest school districts. Districts with 500 or fewer ADM receive a minimum of 3.0 FTE central office administrators and 3.0 FTE classified staff. There are also minimum central office staffing requirements for districts at the 1,000 ADM and 3,500 ADM thresholds. Given what we know about the effects of economies of scale, it is entirely reasonable for the state to provide additional resources to small districts and schools. The question of whether these adjustments are adequate is addressed in the full recalibration report. They are included in this equity discussion because so much of the variation in resources across districts is due to the higher level of funding, on a per ADM basis, found in small districts and schools.

While Table 1.1 provides a summary of fiscal measures for all 48 school districts, policymakers and analysts are also interested in examining whether there are differences among groupings of districts. The most common approach to grouping districts in an equity analysis is by wealth per pupil. These analyses may group districts by percentiles, quintiles, or quartiles. Because there are so few districts in Wyoming this analysis uses quartiles to organize districts into groups.

Table 1.2 presents key fiscal information by each wealth quartile. Quartile 1 includes 12 districts with an average taxable value per ADM of $66,995. The average taxable values per ADM for the remaining three quartiles are $134,115 in quartile 2, $266,463 in quartile 3, and $988,179 in quartile 4. These compare to the state average of $280,992.

The summary data in Table 1.2 shows that per student resources, whether revenues or expenditures, and whether measured on a per ADM or per WADM basis, are quite consistent across the four quartiles. Quartile 3 is consistently somewhat higher in most measures of per ADM or WADM revenues and expenditures. This may be due to the fact that two of the very small districts with high per-pupil revenues, Sheridan #3 and Washakie #2, fall into this quartile. Quartiles 3 and 4 also have higher teacher counts (per 1,000 students) because both quartiles contain a number of smaller school districts. Overall, the data presented here indicate that local wealth has little effect on the amount of resources available to school districts in the state.

Table 1.2

Key School District Enrollment and Fiscal Characteristics by Wealth Quartiles: FY 2015-16

		Wealth Quartile					
School Finance Variables	**State**	**1**	**2**	**3**	**4**	**Min**	**Max**
Districts	48	12	12	12	12	-	-
Number of ADM in Quartile	92,733	28,907	28,133	15,558	20,135	89.7	13,825.1
Need Factor	1.3	1.4	1.3	1.3	1.3	1.2	1.8
General Fund Operating Revenue Per ADM	$15,728	$16,978	$17,644	$20,943	$19,322	$14,039	$42,980
General Fund Operating Revenue Per Weighted ADM	$11,755	$12,135	$13,240	$15,887	$14,747	$10,202	$33,440
General + Special Revenue Fund Operating Revenues Per ADM	$17,400	$22,642	$18,973	$22,507	$21,147	$15,165	$43,854
General + Special Revenue Fund Operating Revenues Per Weighted ADM	$13,005	$15,775	$14,237	$17,068	$16,150	$11,021	$34,120
General Fund Expenditures Per ADM	$14,424	$16,930	$16,127	$18,373	$17,417	$12,776	$34,944
General Fund Expenditures Per Weighted ADM	$10,781	$11,947	$12,100	$13,932	$13,288	$9,371	$27,188
General + Special Revenue Fund Expenditures Per ADM	$15,817	$18,663	$17,506	$19,796	$19,140	$13,890	$35,212
General + Special Revenue Fund Expenditures Per Weighted ADM	$11,822	$13,155	$13,135	$15,008	$14,608	$10,365	$27,396
General Fund Expenditures for Instruction Per ADM	$8,874	$10,015	$9,724	$10,249	$9,842	$7,323	$17,268
General Fund Expenditures for Instruction Per Weighted ADM	$6,633	$7,102	$7,300	$7,770	$7,500	$5,322	$13,436
General + Special Revenue Fund Expenditures for Instruction Per ADM	$9,727	$11,284	$10,661	$11,287	$10,871	$7,694	$17,524
General + Special Revenue Fund Expenditures for Instruction Per Weighted ADM	$7,270	$7,971	$8,005	$8,558	$8,281	$6,179	$14,171
Average Teacher Salary	$60,339	$60,481	$57,374	$56,748	$58,936	$51,236	$70,275
Teachers per 1,000 ADM	85.1	89.4	97.5	109.5	101.3	73.5	181.6
Total Taxable Value per ADM	$280,992	$66,995	$134,115	$266,463	$988,179	$11,160	$3,070,663

II. Horizontal Equity, Vertical Equity, and Fiscal Neutrality

This section of the equity analysis examines horizontal equity, vertical equity, and fiscal neutrality. Horizontal equity is concerned with how equally similarly situated students are funded across school districts. Vertical equity assumes that a greater amount of resources is needed to effectively educate special needs students, such as special education students, ELLs, and at-risk students. Fiscal neutrality examines the relationship between the wealth of districts and the amount of money that districts spend on educating their students.

While there are a number of generally accepted statistical approaches to analyzing equity (Berne & Stiefel, 1984; Odden & Picus, 2014), the study team has found there are several statistical measures that are most useful for policymakers trying to understand the equity of a school finance system. These statistical measures are described below:

Range: Range describes the difference between the smallest and largest values of any given variable, e.g. per student spending. The greater the range within a system, the less likely it is that a system is equitable.

Coefficient of Variation (CV): The CV measures how much items vary around an average. In statistical terms, CV is the standard deviation divided by the mean (average). If per-student expenditures do not vary greatly across districts (low variation), then all of the expenditure figures will be tightly packed around the average. If expenditures *do* vary greatly across districts (high variation), then the expenditure figures will be widely dispersed from the average. The value of the CV ranges from zero and higher, and can be presented as a percentage (30 percent) or as a decimal (0.30). A lower number (closer to zero) indicates less variation and a higher number indicates more variation, with a number more than 0.010 showing a higher amount of variation than is typically desirable in a school finance system.

The range and CV may be used for measuring both horizontal and vertical equity. However, measures of vertical equity use weighted students counts while horizontal equity uses non-weighted counts. By using weighted student counts, which provide a measure of student need, the study team is able to assess how spending varies with student need. The study team's expectation is that higher spending will be associated with higher levels of student need.

McLoone Index and Verstegen Index: The McLoone and Verstegen Indices are lesser known but valuable measures of equity. Used together, they can help to pinpoint where (in terms of the per-student revenue or expenditure distribution of school districts) a state is most equitable or inequitable. The McLoone Index was created to measure the bottom half of the per-student distribution of school districts to indicate the degree of equity of those school districts below the median value of revenues or expenditures per student (or the 50th percentile). The McLoone Index ranges from zero to 1.0, with 1.0 representing perfect equity. An index of at least 0.95 is considered desirable. Conversely, the Verstegen Index provides the same information for the top half of the revenue or spending distribution (those districts above the median revenues or expenditures per student). The ideal value of the Verstegen Index is 1.0 and the standard is no more than 1.05.

Correlation Coefficient: The correlation coefficient is the most common statistic used for measuring fiscal neutrality, or the relationship between per-student property wealth and per-student revenues or spending. A high-quality school finance system will exhibit little relationship between the two, since local property wealth should not determine how much money a school system has available to spend. The correlation coefficient ranges from -1.0 to 1.0, where -1.0 represents a perfect negative relationship and 1.0 represents a perfect positive relationship. In a perfect negative relationship, a one-unit *increase* in one item (such as a one-unit increase in per-student property wealth) results in a one-unit *decrease* in another item (e.g. per-student spending). In a perfect positive relationship, a one-unit *increase* in one item results in a one-unit *increase* in the other item. A correlation of zero means there is no relationship between two items. The generally accepted standard for an acceptable level of equity is equal to or less than 0.50.

Horizontal Equity

Horizontal equity is a measure of how equally similarly situated students are funded across school districts. A state school finance system that is horizontally equitable should meet or exceed the standards of all of the equity statistical measures described above. The variation in revenues or spending that exists among districts should be largely explained by differences in student need.

Table 2.1
Horizontal Equity Summary Statistics

Horizontal Equity Measures	2015-16
Coefficient of Variation (Standard of <=0.10)	
General Fund Operating Revenue Per ADM	0.286
General + Special Revenue Fund Operating Revenues Per ADM	0.346
General Fund Expenditures Per ADM	0.281
General + Special Revenue Fund Expenditures Per ADM	0.271
General Fund Expenditures for Instruction Per ADM	0.228
General + Special Revenue Fund Expenditures for Instruction Per ADM	0.233
Average Teacher Salary	0.064
Average Teacher Years of Experience	0.142
Average Percentage of Teachers with MA or Greater	0.263
Teachers Per 1,000 ADM	0.231
McLoone Index - General Fund Operating Revenues/ADM (Standard of >= 0.95)	0.89
McLoone Index - General Fund Expenditures/ADM (Standard of >= 0.95)	0.90
Verstegen Index - General Fund Operating Revenues/ADM (Standard of <= 1.05)	1.13
Verstegen Index - General Fund Expenditures/ADM (Standard of <= 1.05)	1.16

The top portion of Table 2.1 shows the CV for a number of different types of resources, including per ADM revenues and expenditures and key teacher characteristics. All but one of the CVs presented here exceed the standard noted above of equal to or less than 0.10. This would suggest there is more variation than would be expected in these resource measures among districts if Wyoming's funding system was truly equitable. The one measure that meets the standard is variation in teacher salaries, with a CV of 0.064. However, as noted above, due to the number of small schools and districts in the state, these results may be misleading. More in-depth analysis of the data shows that much of this variation is due to the state's policy of providing more resources per ADM to small schools and districts to compensate for their lack of economies of scale.

First, the study isolated those districts in the 90th percentile and above in general fund revenues (those exceeding $25,223 per ADM) and those in the 10th percentile (those below $13,416 per ADM) and compared their enrollment size and need levels. The information in Table 4 shows that the districts in the highest revenue percentile all have small ADM counts, averaging 252.2 ADM. The districts in the bottom percentile are all much larger, averaging 5,496.4 ADM. It should also be noted that most of the small districts also consist of small schools eligible for the small school minimum staffing adjustments. These data also show that need does not play a significant role in differences between these two sets of districts. On average, the need factor is similar across the two groups, averaging 1.4 for the top percentile and 1.3 for the bottom percentile. However, the top group does include two higher need districts, Fremont #21 at 1.56, and Fremont #38, which at 1.76 has the highest need ratio in the state.

Table 2.2
Comparison of Districts in 90th and 10th Percentiles of GF Revenues

District	Per ADM GF Revenues	ADM	Need Factor
Districts in 90th Percentile			
Sheridan #3	$34,944	89.7	1.29
Fremont #2	$27,794	141.5	1.32
Fremont #38	$27,666	418.5	1.76
Park #16	$26,228	114.5	1.27
Districts in 10th Percentile			
Sheridan #2	$13,246	3,433.1	1.29
Lincoln #2	$13,195	2,788.7	1.31
Natrona #1	$13,186	12,826.5	1.35
Uinta #4	$12,975	2,785.4	1.22
Sweetwater #1	$12,776	5,648.2	1.36

The study team also broke districts into size quartiles. Districts in quartile 1, the smallest districts, had enrollments of fewer than 574 ADM. Districts in quartile 2 had ADM counts between 574 and 959. Districts in quartile 3 had ADM counts between 960 and 1,899. And, districts in quartile 4 had ADM counts equal to or greater than 1,899. What Table 5 shows is that as districts get larger, the variation in revenues decreases. The CV is highest in quartile 1, which includes the smallest districts, and decreases to well under the 0.10 standard in the two quartiles with the largest districts. Finally, the correlation coefficient of general fund revenues to district size is -.391, a moderate negative relationship (i.e. as district enrollment decreases, general fund revenues increase). Taken together, this evidence shows that the higher than desirable variance in revenues and expenditures per ADM found when analyzing all districts is actually a result of state policies to adjust per ADM funding so that small districts are not disadvantaged.

Table 2.3
CV by Size Quartiles

Size Quartile	GF Revenues	GF Expends
1	0.253	0.216
2	0.135	0.165
3	0.084	0.059
4	0.056	0.052

The study team also used the McLoone and Verstegen indices in an effort to identify where in the range of district resources per ADM the most inequality occurs. For example, is variation large throughout the system or is there greater inequality among the lowest- or highest-spending districts? A higher Verstegen Index would be consistent with the results of the size quartile analysis, showing higher levels of variation at the top end of the distribution of per ADM revenue or expenditures due to the higher resource levels found in small districts. The results of the McLoone Index and Verstegen Index analyses presented in Table 2 show that this is the case. The McLoone Index for general fund revenues and expenditures per ADM are 1.13 and 1.16, respectively. The index for general fund revenues is eight points above the standard of 1.05, while the index for expenditures is 11 points above. The McLoone Index for revenues is six points below the standard and five points below the standard for expenditures. This confirms that resource variation is greater in the top half of the distribution of districts.

Vertical Equity

The results for vertical equity are very similar to the horizontal equity results. Vertical equity assumes a greater amount of resources is needed to effectively educate special needs students. This vertical equity analysis used weighted student counts in the CV calculation, thereby taking into account the variations in spending between districts with different numbers of special needs students. As was the case with the horizontal equity analysis, all of the CVs presented in Table 5 exceed the 0.10 standard. Again, much of this variation can be attributed to the funding adjustments for small districts and schools.

Table 2.4
Vertical Equity Summary Statistics

Vertical Equity Measures	2015-16
Coefficient of Variation (Standard of <=0.10)	
General Fund Operating Revenue Per WADM	0.260
General + Special Revenue Fund Operating Revenues - Excl. Fed. Per Weighted ADM	0.281
General + Special Revenue Fund Operating Revenues - Incl. Fed. Per Weighted ADM	0.315
General Fund Expenditures Per Weighted ADM	0.274
General + Special Revenue Fund Expenditures Per Weighted ADM	0.261
General Fund Expenditures for Instruction Per Weighted ADM	0.220
General + Special Revenue Fund Expenditures for Instruction Per Weighted ADM	0.218
Teachers Per 1,000 ADM	0.246

However, revenue and expenditure amounts vary to some extent because of differences in student needs. For example, general fund expenditures include spending for programs for at-risk students, ELL students, and students with disabilities. By weighting the ADM counts using the weights for these service categories, less variation in per-student revenues and expenditures would be expected (and when looking at resources on a weighted ADM basis). The differences in the CVs calculated on a WADM basis in Table 6 are somewhat lower than the ADM-based CVs in Table 3, but the differences are very small. This suggests the additional resources in the funding model targeted to students with special needs may not be great enough to ensure vertical equity across districts. A larger difference in the CVs calculated using weighted ADM versus unweighted ADM would indicate the funding model allocates significantly more resources to those districts with a high concentration of special need students.

This finding is supported by several correlations between the need factor and other resource measures. The correlation between the need factor and general fund operating revenues per ADM is only 0.037, indicating a very weak relationship between need and per-ADM general fund revenues. The relationship between per-WADM general fund revenues is actually slightly negative, at -0.192, suggesting a weak, negative relationship between need and general fund revenues. The relationship between need and general fund expenditures is similar, with a correlation coefficient of 0.024 between need and general fund expenditures per WADM. Adding special revenue fund revenues or expenditures, which tend to be more targeted toward special need students, improves the strength of the relationships somewhat. The correlation between need and general fund + special revenue fund revenues per WADM improves to 0.325, a low to modest positive relationship. The correlation between need and combined expenditures per WADM is also improved, with a coefficient of 0.219.

Fiscal Neutrality

Fiscal neutrality examines the relationship between the wealth of a district and the resources it has for educating its students. The statistical measure used here for measuring fiscal neutrality is the correlation coefficient. The correlation coefficient assesses the strength and direction of two variables related to fiscal neutrality, such as per-ADM taxable value and per-ADM revenues or expenditures. In an equitable school finance system, there should be little or no relationship between local wealth and resource levels. The results presented in Table 6 show that Wyoming has a very high level of fiscal neutrality (e.g. there is little to no relationship between local wealth and school district resources).

The analysis summarized in Table 2.5 assesses the correlation between per-ADM taxable values, a number of different resource variables (including general fund per ADM and WADM revenues), general fund per ADM and WADM expenditures, combined general and special revenue fund revenues and expenditures per ADM and WADM, and teacher salaries and teachers per 1,000 ADM.

Table 2.5
Fiscal Neutrality Summary Statistics

Fiscal Neutrality Measures	2015-16
Correlation Coefficient (Standard of <=0.50)	
Taxable Value/ADM and General Fund Operating Revenue/ADM	0.136
Taxable Value/ADM and General Fund Operating Revenue/WADM	0.196
Taxable Value/ADM and General + Special Revenue Fund Operating Revenues - Federal/ADM	0.232
Taxable Value/ADM and General + Special Revenue Fund Operating Revenues - Federal/WADM	0.293
General Fund Expenditures Per ADM	
General Fund Expenditures Per WADM	0.140
General + Special Revenue Fund Expenditures/ADM	0.104
General + Special Revenue Fund Expenditures/WADM	0.198
Taxable Value/ADM and Average Teacher Salary	0.034
Taxable Value/ADM and Teachers Per 1,000 ADM	0.116

As Table 2.5 shows, the correlations between taxable value per ADM and all of these variables are very low, well below the standard of 0.50. The correlations with key measures of teacher resources (average teacher salary and teachers per 1,000 ADM) are also very low. These results provide strong evidence that Wyoming's school funding system is very effective at severing any relationship between district wealth and district resources.

District Fund Balances

APA was also asked to examine whether the amount of school districts' cash fund balances varied in a way that may indicate inequities in funding levels across different types of districts. For example, are larger fund balances found in smaller or larger districts? Under state law, districts are allowed to maintain a general fund balance of up to 15 percent of their foundation program guarantee net of exclusions consisting of Federal Impact Aid, pre-1997 cash reserves, and a one-time appropriation correcting a 1999 half-day kindergarten ADM calculation error. Reserves exceeding this amount are considered local revenues for purposes of entitlement and recapture calculations. Over the past three fiscal years the 15 percent limitation has been exceeded six times by six different districts. Three districts exceeded it in 2013-14 (Converse #2, Sublette #1, and Washakie #2), one in 2014-15 (Uinta #6) and two in 2015-16 (Weston #7 and Lincoln # 1). Table 8 presents 2015-16 amounts for districts' general fund balances, its percentage of their foundation guarantee, and fund balance per ADM.

Table 8
2015-16 Fund Balances by District

	Net Fund Balance Subject to 15% Limitation Test		
District	**Dollars**	**% of Guarantee**	**Dollars Per ADM**
Albany #1	$1,272,588	2.2%	$328
Big Horn #1	$2,390,833	14.4%	$2,408
Big Horn #2	$483,804	4.5%	$699
Big Horn #3	$653,170	7.0%	$1,261
Big Horn #4	$979,484	13.3%	$3,296
Campbell #1	$18,696,559	14.0%	$2,069
Carbon #1	$3,565,570	13.1%	$1,933
Carbon #2	$1,649,479	11.0%	$2,565
Converse #1	$4,396,174	14.7%	$2,547
Converse #2	$1,118,983	9.8%	$1,725
Crook #1	$1,344,410	6.4%	$1,178
Fremont #1	$2,928,678	10.8%	$1,750
Fremont #14	$1,399,744	11.8%	$2,241
Fremont #2	$422,192	9.9%	$2,983
Fremont #21	$1,447,084	14.6%	$2,912
Fremont #24	$1,053,008	14.0%	$2,681
Fremont #25	$4,978,164	13.1%	$1,985
Fremont #38	$1,330,557	13.4%	$3,179
Fremont #6	$476,400	5.8%	$1,270
Goshen #1	$3,545,682	11.8%	$2,041
Hot Springs #1	$497,722	4.6%	$760
Johnson #1	$2,022,533	9.8%	$1,598
Laramie #1	$27,243,469	13.6%	$1,971
Laramie #2	$2,231,711	12.1%	$2,286
Lincoln #1	$1,645,828	15.6%	$2,764
Lincoln #2	$4,993,075	12.0%	$1,790
Natrona #1	$15,409,447	8.2%	$1,201
Niobrara #1	$751,924	5.8%	$883
Park #1	$3,716,953	14.6%	$2,080
Park #16	$459,782	13.3%	$4,015
Park #6	$2,553,508	8.2%	$1,239
Platte #1	$2,034,688	11.5%	$2,053
Platte #2	$690,262	13.4%	$2,877

District	Net Fund Balance Subject to 15% Limitation Test		
	Dollars	% of Guarantee	Dollars Per ADM
Sheridan #1	$1,112,478	7.2%	$1,181
Sheridan #2	$6,284,796	13.0%	$1,831
Sheridan #3	$144,817	3.9%	$1,614
Sublette #1	$2,027,012	12.0%	$1,987
Sublette #9	$1,472,212	13.0%	$2,483
Sweetwater #1	$9,252,355	11.7%	$1,638
Sweetwater #2	$5,507,527	13.8%	$2,074
Teton #1	$6,234,494	13.4%	$2,260
Uinta #1	$3,152,680	7.8%	$1,132
Uinta #4	$1,565,133	12.9%	$1,887
Uinta #6	$1,704,769	14.8%	$2,472
Washakie #1	$2,455,254	11.6%	$1,812
Washakie #2	$438,084	14.3%	$4,111
Weston #1	$1,315,098	10.4%	$1,653
Weston #7	$924,502	15.2%	$3,468
State	$161,974,678	11.2%	$1,747

Source: Wyoming Department of Education

In 2015-16, the percentage of fund balance to foundation guarantee runs from 2.2 percent in Albany #1 to 15.6 percent in Lincoln #1. The amount of fund balance per ADM ranges from $328 in Albany #1 to $4,111 in Washakie #2. While these figures show a wide range in the size of fund balances, the majority of districts possess double digit fund balance percentages, with 33 of the state's 48 districts holding fund balances in excess of 10 percent. The amount of districts' fund balances per ADM are moderately correlated with general fund revenues (0.505) and expenditures (0.553), but are only weakly correlated with district size, as measured by the number of ADM (-0.251) or need factor (0.149). The relationship between the fund balance amount per ADM and two other district resource measures is mixed. There is a moderate positive relationship with teachers per 1,000 ADM (0.507) but a weak, negative relationship with average teacher salary (-0.107). In short, higher spending districts also appear to have larger fund balances, but fund balance size is not correlated with size or student need.

III. Conclusions

Overall, the results of the equity analysis show that Wyoming's school finance system is quite equitable based on commonly accepted methods and standards for measuring the equity of state school finance systems. The measures of the state's horizontal equity show more variation in per-ADM revenues and spending than is desirable in an equitable school finance system. However, further analysis shows that much of this variation is due to funding adjustments made to accommodate very small school districts and schools. The finance system exhibits a very high level of fiscal neutrality. All of the correlations used to measure this were well below the commonly accepted standard.

The one area of potential concern is vertical equity. A state system with a high level of vertical equity should see at least a modest decrease in the amount of variance in per-student revenues and expenditures when comparing between revenues or expenditures per ADM versus per-weighted ADM. Although the variance measures did decrease in this analysis, the amount of the decrease was very small. This is an indication that Wyoming's funding model may not provide enough additional resources for programs for students with special needs to compensate for differing levels of student need across school districts.

References

Berne, R. & Stiefel, L. (1984). *The Measurement of Equity in School Finance: Conceptual, Methodological, and Empirical Dimensions*. Baltimore, MD: Johns Hopkins University Press.

Odden, A. R. & Picus, L.O. (2014). *School Finance: A Policy Perspective* (5th ed.). New York, NY: McGraw-Hill.

Snyder, T. D., de Brey, C. & Dillow, S.A. (2016). *Digest of Education Statistics 2015* (NCES 2016-014). Washington, DC: National Center for Education Statistics, Institute for Education Sciences, U.S. Department of Education.

Supplemental Report C

Review of Teacher Salaries, Regional Cost Adjustment, and External Cost Adjustment

Prepared for the

Select Committee on School Finance Recalibration

By

Daniel Player, University of Virginia

On behalf of

Augenblick, Palaich and Associates

Final, January 12, 2018

Contents

I. An Updated Analysis of Wyoming Teacher Salaries

Overview

The purpose of this analysis was to analyze the attractiveness of Wyoming teacher salaries. The first part of the analysis focused on Wyoming teacher salaries relative to: 1) other salaries of college-educated people in the state, and 2) salaries of teachers and non-teachers in other states. The second part of the analysis focused on differences in salary levels within the state to determine whether some regions have markedly different salaries and attrition rates from teaching. The methods in this analysis mirror those conducted in previous analyses of teacher salaries in Wyoming.

The results of these analyses are consistent with prior estimates, and indicate that teacher salaries in Wyoming are higher than teacher salaries in neighboring states. However, the advantage over other regions is beginning to shrink. Since 2013, teacher salaries have lost ground in Wyoming relative to other full-time, employed college graduates. This is largely because teacher salaries have remained relatively flat, while other Wyoming workers' salaries have increased significantly since 2010. After adjusting for inflation and rising wages in non-teaching jobs, teacher salaries in Wyoming have fallen by up to 13 percent since 2012. Districts typically pay above the model salaries determined by the state by an average of roughly $3,900 annually, but there has been relatively little change in model salaries or received salaries over the period 2011-12 to 2016-17.

Since 2014, there has been a slight rise in the number of teachers leaving teaching, and the trend appears to be similar for experienced (those with more than three years of experience) and those with three years of experience or less. Comparison estimates of teacher turnover are not available with neighboring states or the nation over this same period, so we cannot rule out that this reflects a larger general trend in the teacher labor market. However, it does suggest Wyoming should closely monitor trends moving forward.

Within Wyoming, there is a fairly wide range of average salaries across districts and regions. Teachers in the districts with the highest teacher salaries can expect to be paid roughly $18,000 more, on average, than teachers in districts with the lowest average salaries. These differences translate to modest regional differences in average salary. Average salaries in the southwest region of Wyoming, the highest paying region in the state, are approximately five percent higher than in the in the central region, the lowest paying region.

Analysis of teacher departure rates by district and region revealed no discernible pattern to suggest differences in salaries explained meaningful differences in departure rates. Departure rates from the profession vary widely across districts, and vary substantially within districts across years. There is no discernible correlation between departure rates and salary levels, either measured as model salaries or payments districts make above model salary rates.

Recommendations: If Wyoming is interested in maintaining its advantage over its neighbors in terms of the relative attractiveness of teacher salaries, we recommend a substantial level adjustment to keep pace with the rate of growth of non-teaching salaries in the region. As a result, we recommend increasing the average funding model teacher salary by $3,900 to bring funding model salary levels back in line with the actual salaries paid by districts across the state.

Background

In 2015, Dr. Christiana Stoddard (2015) provided a report to the Wyoming Select Committee for School Finance Recalibration that examined trends in teacher salaries for the period 2000 to 2014. The focus of that report was to provide an estimate of how attractive it was to teach in Wyoming public schools by comparing Wyoming teacher salaries with: 1) the salaries of professionals in other non-teaching professions in the state, and 2) the teaching salaries of neighboring states. The rationale for such a comparison is that prospective teachers have a choice of whether to enter or remain in the teaching profession and, if they decide to teach, whether they will teach in Wyoming. Teacher salaries that either fall below comparable occupations or below teachers in other states could cause teachers to exit schools and potentially create challenges for Wyoming schools in retaining teachers.

Stoddard concluded that teacher salaries in Wyoming had risen sharply between 2005 and 2010 and were considerably higher than teacher salaries in neighboring states. She found that Wyoming teacher salaries were much closer to professional non-teacher salaries in Wyoming than other states' teacher salaries were to the non-teacher professionals in their states. She also concluded there was little evidence that teacher exits were a substantial concern for Wyoming.

The purpose of this report is to update Dr. Stoddard's initial report in two ways. First, the study team examines data that extends through the 2016-17 school year, and second, this analysis extends her analyses to examine district and regional differences in salaries and teacher departures. These extensions will help determine whether there is any evidence that the picture has changed since her original work, and to see whether state averages are masking substantial regional variation in some of the key metrics used.

Data

The data for these analyses come from the Wyoming Department of Education (WDE) and from two national surveys of worker compensation. Each data source has advantages in the coverage and the level of detail on the respondents. Each is described below:

American Community Survey*:* The American Community Survey (ACS) is an annual survey conducted by the U.S. Census Bureau to assess, among other things, the wages and salaries of workers in many different occupations and regions.[1] For this analysis, we focus the analysis on respondents from Wyoming and its bordering states (Colorado, Idaho, Montana, Nebraska, South Dakota, and Utah) in the years 2003 through 2016, the year with the most recently available data. The advantage of these data is that they provide sufficient detail to restrict comparisons to other people in the sample who are college educated and working full-time jobs. This allows a closer comparison to teachers. The disadvantages of

[1] For more information on the ACS, please see the ACS website: https://www.census.gov/programs-surveys/acs/about.html

the data are: 1) we cannot directly observe teacher experience, a critical determinant of teacher salary; and 2) sample sizes restrict our ability to estimate salary levels within the state.

Occupational Employment Statistics: Occupational Employment Statistics (OES) are generated by the U.S. Bureau of Labor Statistics (BLS) and provide the number of people and the average earnings of workers in over 800 occupations at the national, state, and metropolitan and nonmetropolitan statistical area level.[2] As with the ACS, these statistics are updated annually. The Wyoming Department of Workforce Services supplements the federal OES data collection to produce county-level employment statistics averaged over three years to account for the relatively small sample sizes within the county.[3] The primary advantage of these data is that they are available at the county level in Wyoming, so we can compare regional wage differences within the state. They are also available at the state level for Wyoming and its neighboring states, which allow a consistent comparison across state borders. The disadvantages of the data are: 1) they do not distinguish between public and non-public school teachers; and 2) we cannot observe the educational level of the occupations, which makes it more difficult to find comparisons with other college-educated adults. To address the latter limitation, we restrict our analysis to a set of occupations that have been identified in prior research as being similar to teaching in terms of job characteristics and required qualifications. But, because of the differences in data between the OES and the ACS, readers should be cautious in making direct comparisons of salary levels between the two data sources, although the general trends should be comparable.

Wyoming Department of Education. For this analysis, the WDE provided us with salaries, full-time employment status, degree attainment, experience, and assignments for every Wyoming public school employee between 2011-12 and 2016-17. The advantage of the WDE data is that it is comprehensive because it includes every teacher in the state. Also, unlike the ACS or OES, it is generated from administrative data and does not rely on worker self-reports. Therefore, we expect the WDE data to be more precise than either of the other two survey data sources because it has less measurement error. The major disadvantage of the data is that it is only available for teachers in Wyoming and does not permit comparisons with neighboring states.

Findings

The subsections below address some of the key questions that are critical in our assessment of the attractiveness of teacher salaries in Wyoming, and how that attractiveness has changed over time. Each subsection begins with the key question that is being addressed and a description of the methodological considerations specific to this question. We then conclude with the findings.

1. How do Wyoming teacher salaries compare to the salaries of similar non-teacher occupations, and how does the relative attractiveness of Wyoming teacher salaries compare with the relative attractiveness of teacher salaries in neighboring states?

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[2] For more information on the OES, please see the OES website: https://www.bls.gov/oes/

[3] For more information on Wyoming's OES data collection, please see Occupations, Earnings, and Wages page of the Wyoming Department of Workforce Services web page: http://doe.state.wy.us/lmi/oes.htm

The primary purpose of salary comparisons between teachers and non-teachers is to determine the relative attractiveness of teaching salaries for those who might be interested in teaching. Some occupations are more likely to be attractive for the types of people who become teachers, while other occupations might be less likely to attract the types of people who become teachers. The challenge is that it is difficult to know what kinds of occupations compete for teachers. For instance, an analysis of the NCES Teacher Follow-up Survey reveals that most people who leave teaching stay in education in one way or another, and those who leave education go to a broad array of occupations, ranging from janitors to retail to law (Fowler & Mittapalli, 2006; Startz, 2001). Therefore, it is not clear which occupations should be included in a comparison for teachers. To illustrate, Wyoming has seen significant growth in the energy industry over the last decade, and it is not clear whether relatively high-paying "blue collar" jobs in the energy sector are an attractive option that might lure teachers away from the classroom. Unfortunately, there is no simple solution to this problem. Comparing teacher salaries to all non-teacher salaries might overstate the attractiveness of teacher salaries if there are many lower-paying occupations that are not competing for the types of people who become teachers.

Therefore, we analyzed this question in two ways. First, we used the person-level data available from the ACS to statistically adjust non-teaching salaries to reflect the characteristics of teachers.[4] Second, we restricted the OES data to only those occupations that other research has found to be most similar to teaching: management; business; computers and mathematics; architecture; science; community and social services; legal; training; arts, design, entertainment, sports, and media; and healthcare (Allegretto, Corcoran & Mishel, 2004).

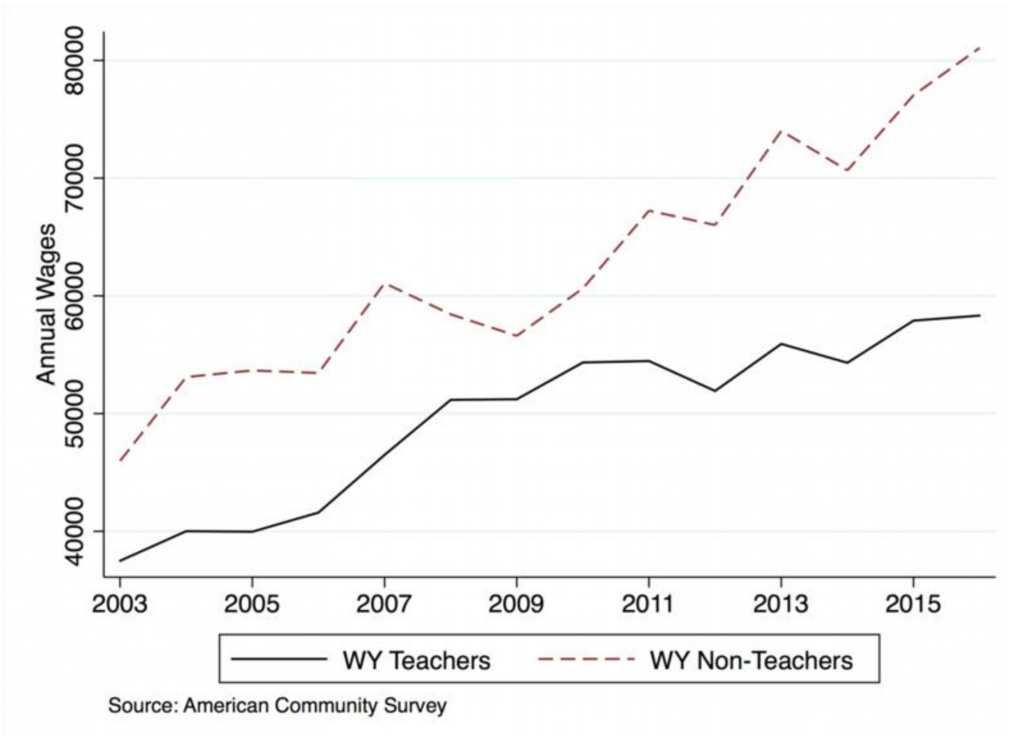
Except where otherwise noted, we report salaries that have not been adjusted for inflation or cost of living. We do this to facilitate comparisons and because a national inflation adjustment, such as the consumer price index (CPI), might not accurately reflect inflation in a particular state.

Results. Data from the American Community Survey suggest the average teacher in Wyoming made roughly $58,000 in 2016 compared with the $73,527 made by non-teachers with similar personal and educational profiles as the teacher workforce. The OES estimates for teachers are very similar. They estimate teachers in Wyoming made approximately $58,700 in 2016, while those in occupations similar to teaching made approximately $66,000. It is encouraging that both data sets estimate very similar teacher salaries. Non-teacher salaries are different depending on the source, but that is to be expected given the different definitions of non-teachers in the two data sources. One might interpret these as upper and lower bounds, respectively, on comparable occupations.

[4] Specifically, we ran an ordinary least squares regression of wages on age, age^2, gender, degree level, and race, with state and year fixed effects, on the sample of non-teachers. We then took the coefficients from this regression to predict the non-teacher salaries for all teachers in our sample. We ran this analysis in several ways, including using only the characteristics of Wyoming teachers as well as the characteristics of teachers in their respective states. The differences were trivial, so we present the analysis that uses the characteristics of each state's own teachers.

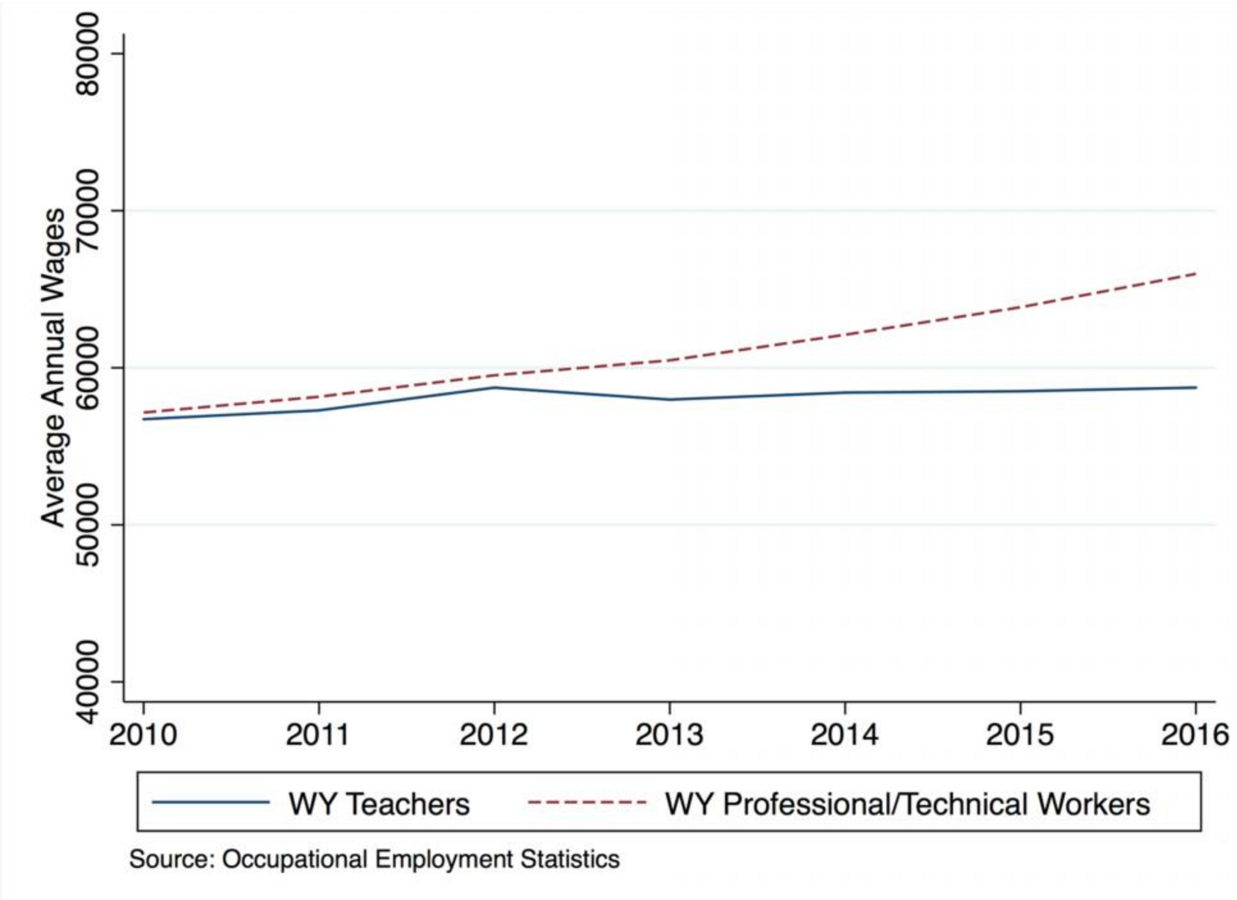
Between 2003 and 2011, there appeared to be a narrowing of the gap in salaries between teachers and non-teachers in Wyoming (Figure 1.1). Since that time, the growth of non-teacher salaries has been nearly twice that of teacher salaries. Over the period from 2011 to 2016, teacher salaries have risen by approximately $4,400 (or about seven percent), while the salaries of non-teachers with similar characteristics rose by roughly $13,800 (or about 17 percent) (Figure 1.1).

Figure 1.1
Teacher Salaries and Salaries of Other Full-time College Graduates in Wyoming Over Time



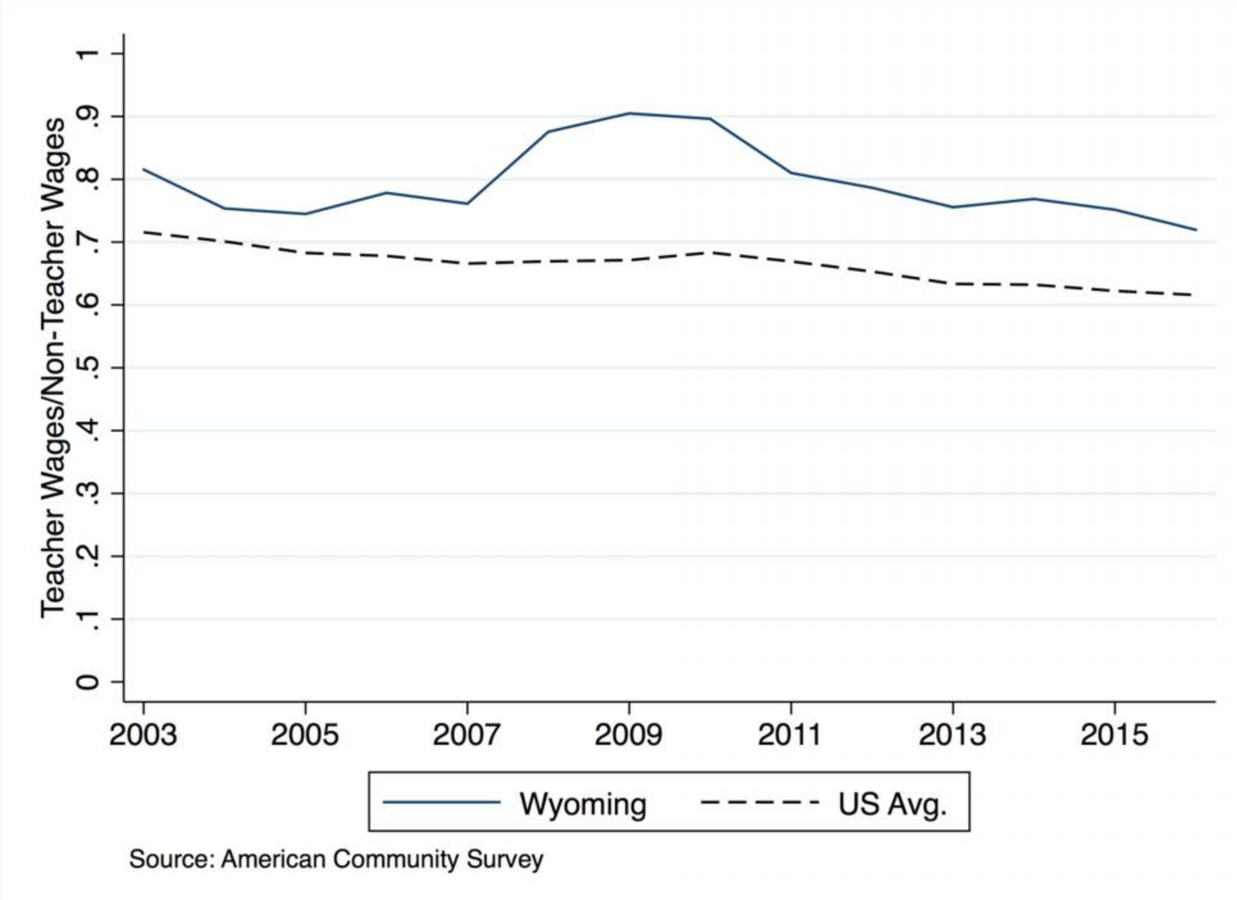
The OES data confirm the general patterns found in the ACS, but the trends are more pronounced over time (Figure 1.2). We do not go as far back on the OES data, but the trend between 2010 and 2012 suggests teacher salaries of professional and technical workers map closely with teacher salaries, and then outpace teacher salaries markedly over the period of 2012 to 2016. One important illustration from the OES data is that the differences between professional/technical workers and teachers is due mostly to a stagnation of teacher salaries over the period rather than accelerated growth of professional/technical worker salaries over time.

Figure 1.2
Teacher Salaries and Salaries in Comparable Occupations in Wyoming Over Time



An alternative way to examine the relative attractiveness of teacher salaries over time is to examine the ratio of teacher salaries to the salaries of non-teachers with similar characteristics. A ratio of 1.0 would indicate that teachers and non-teachers earn the same amount, while a ratio below 1.0 indicates that teachers earn less than non-teachers and a ratio above 1.0 suggests the opposite. Figure 1.3 confirms that teacher salaries were gaining ground on non-teacher salaries until around 2010, and have been steadily falling since that time. The relative change in Wyoming reflects a general national trend of declining relative teacher salaries, but the change has been more pronounced in Wyoming because, at one point, the teacher salaries were approaching parity with non-teacher salaries. Recent research by the Economic Policy Institute also confirms the general national trend of declining relative teacher salaries (Allegretto & Mishel, 2016).

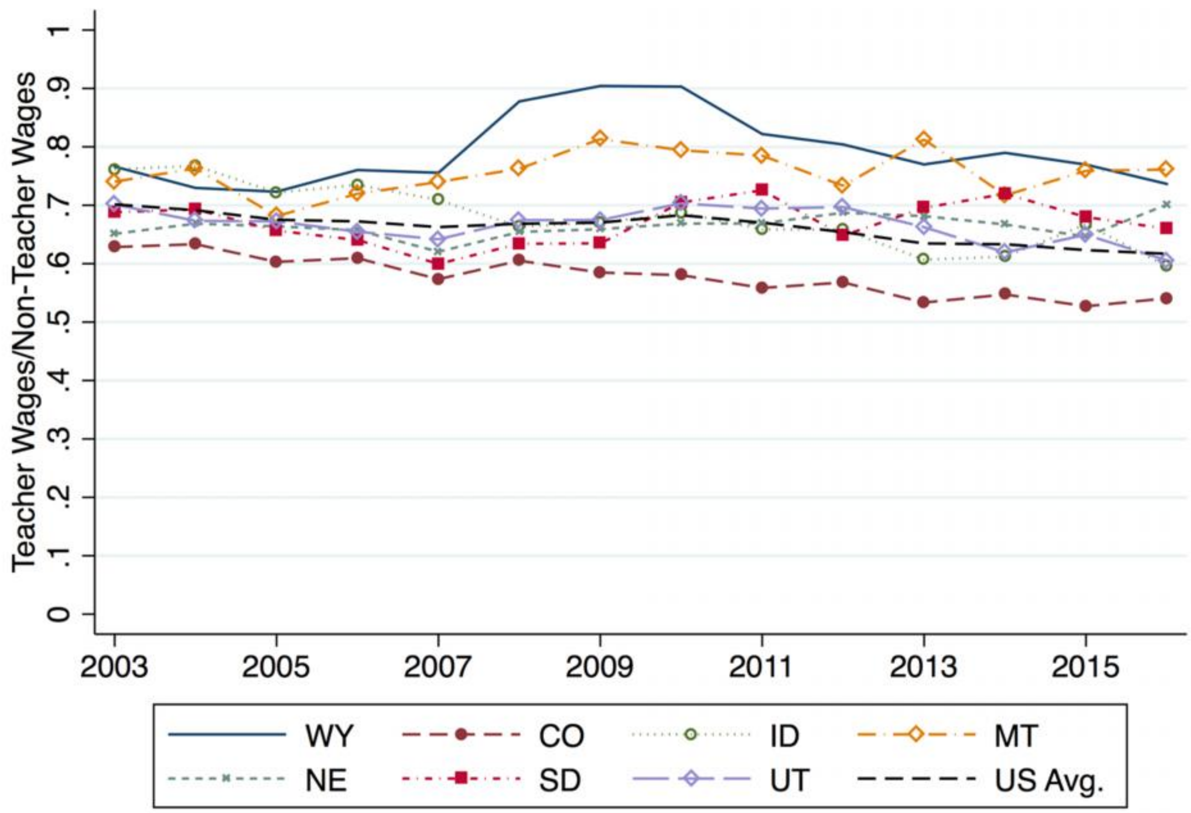
Figure 1.3
Ratio of Teacher Salaries to Non-Teacher Salaries in Wyoming and the U.S. Over Time



Although teacher salaries have not grown as rapidly as non-teacher salaries in Wyoming, it is instructive to see whether this is a phenomenon that is isolated to Wyoming or whether similar trends have been observed in neighboring states. To address this question, we examined the ratio of teacher salaries to non-teacher salaries in Wyoming and in the six states that border Wyoming (Colorado, Idaho, Montana, Nebraska, South Dakota, and Utah).

Results: Wyoming teacher salaries are much closer to Wyoming non-teacher salaries than in neighboring states (Figure 1.4). With the exception of Montana, none of the bordering states approached the ratio of salaries found in Wyoming. However, the salary ratio appears to be falling faster in Wyoming than in neighboring states, suggesting Wyoming teachers have lost some of the relative advantage over the past five years. To illustrate, the salaries of teachers in neighboring states were at 63 percent of those of non-teachers in 2011 and, as of 2016, salaries were at 59 percent of those of non-teachers. Wyoming teachers, by contrast, fell from 81 percent of non-teacher salaries to 72 percent. In absolute terms, salaries of teachers in neighboring states have fallen about four percentage points, while salaries of Wyoming teachers have fallen about eight percentage points. It is worth noting that Wyoming teachers were paid relatively more in 2016 than teachers in most neighboring states have ever been paid, but the downward trend is worth noting. A comparison of ACS estimated average teacher and non-teacher salaries in Wyoming to the national average and to those of surrounding states for the years 2003 through 2016 is provided in Table A1 in Appendix A.

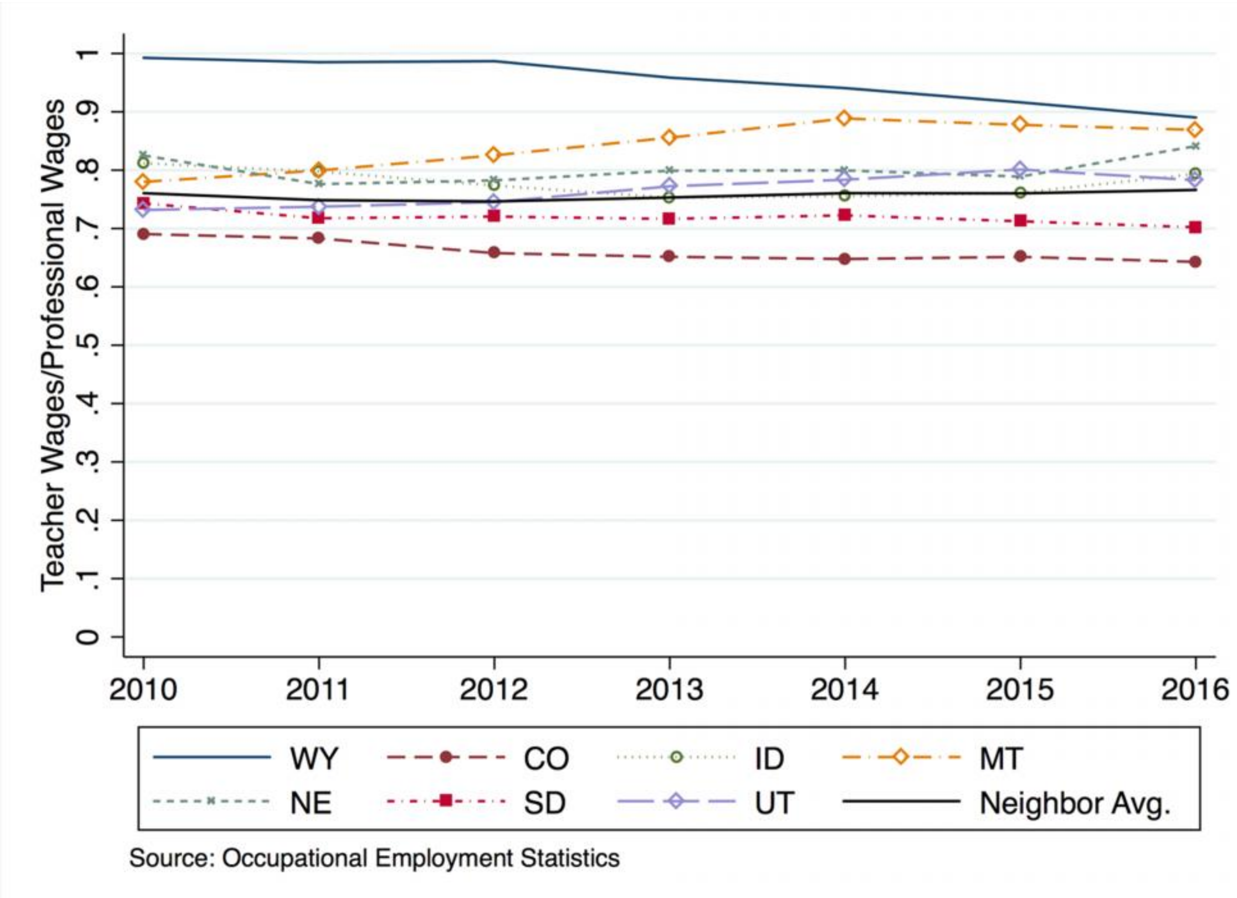
Figure 1.4
Ratio of Teacher Salaries to Non-Teacher Salaries in Wyoming and the U.S. Over Time



Source: American Community Survey

The OES data paint a similar picture, but the narrowing of the gap is more starkly visible (Figure 1.5). On average, neighboring states have held almost constant over the period from 2010 to 2016, while the Wyoming ratio of teacher salaries to professional/technical workers started at close to 1.0 in 2010 and has fallen about 10 percentage points to 0.9. As with the OES data, Montana is the neighboring state that comes the closest to the relative attractiveness of Wyoming, and in 2016, it had nearly closed the gap entirely. Colorado, in contrast, continues to be well below Wyoming, as the lowest relative wage state. A comparison of OES estimated average teacher and professional and technical worker salaries in Wyoming to those of surrounding states for the years 2010 through 2016 is provided in Table A2 in Appendix A.

Figure 1.5
Ratio of Teacher Salaries to Professional and Technical Worker Salaries in Wyoming and Neighboring States Over Time



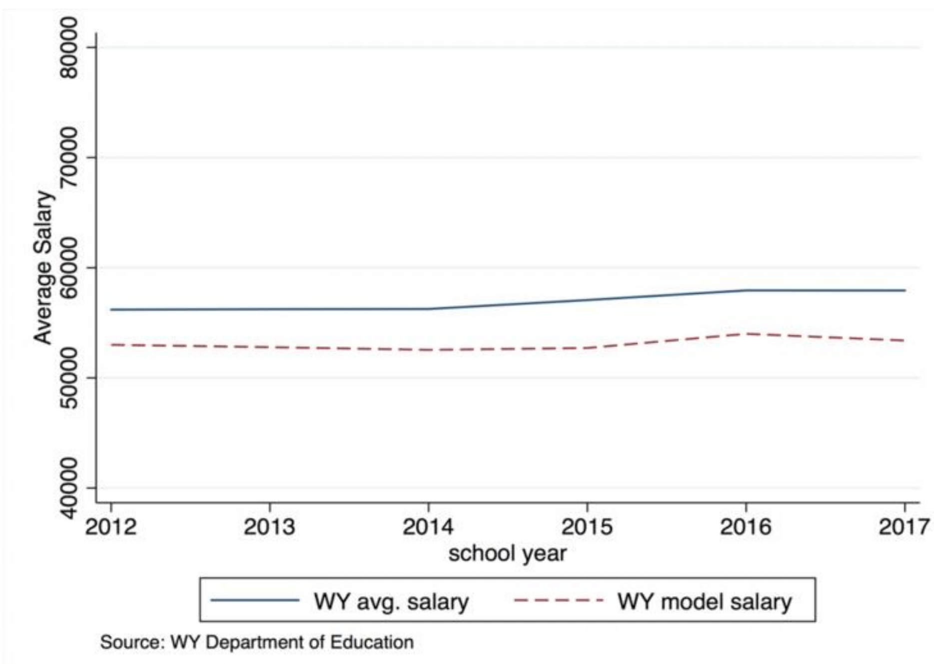
Summary. Taken together, the findings suggest Wyoming teacher salaries have lost ground relative to the salaries of a broad class of non-teachers in Wyoming, particularly since 2011-12. A similar pattern has been seen in neighboring states and in the United States more generally, but the decline in Wyoming has been somewhat more pronounced. As a result, Wyoming teachers are still relatively better situated than teachers in neighboring states, but the gap appears to be shrinking. Without an upward adjustment of teacher salaries, the trends suggest Wyoming could soon be eclipsed by Montana and Idaho, but they still have substantial advantage over other states in the region.

2. What do administrative data suggest about the patterns in Wyoming teacher salaries over time?

We answered this question with comprehensive administrative data from WDE on teacher salaries for 2011-2012 to 2016-17. We focused this analysis on base salary and excluded pay for other responsibilities (e.g. coaching). The data are reported by assignment, and some teachers have multiple assignments as part of their full-time job. For example, a teacher might work half-time in one school and half-time in another school. To generate the full-time salary, we sum the base salary of every teaching assignment an employee holds. For teachers working less than full time, we generate a full-time equivalent salary by dividing the salary by the percentage of a full-time equivalent (FTE) position. For example, if a teacher is working 0.5 FTE and earns $30,000, we adjust the salary to the full-time equivalent of $30,000/0.5 or $60,000. This is the adjustment WDE makes when reporting average salaries and we wanted to make our analysis match as closely to their values as possible. This report focuses only on those with teaching assignments, although subsequent reports will produce similar estimates for non-teaching positions in the state, including principals, central office administrators, and classified staff. It is important to note that these data reflect the actual salaries earned by teachers in the state and may be different from levels on published salary schedules if districts pay teachers above what is indicated on the salary schedule.

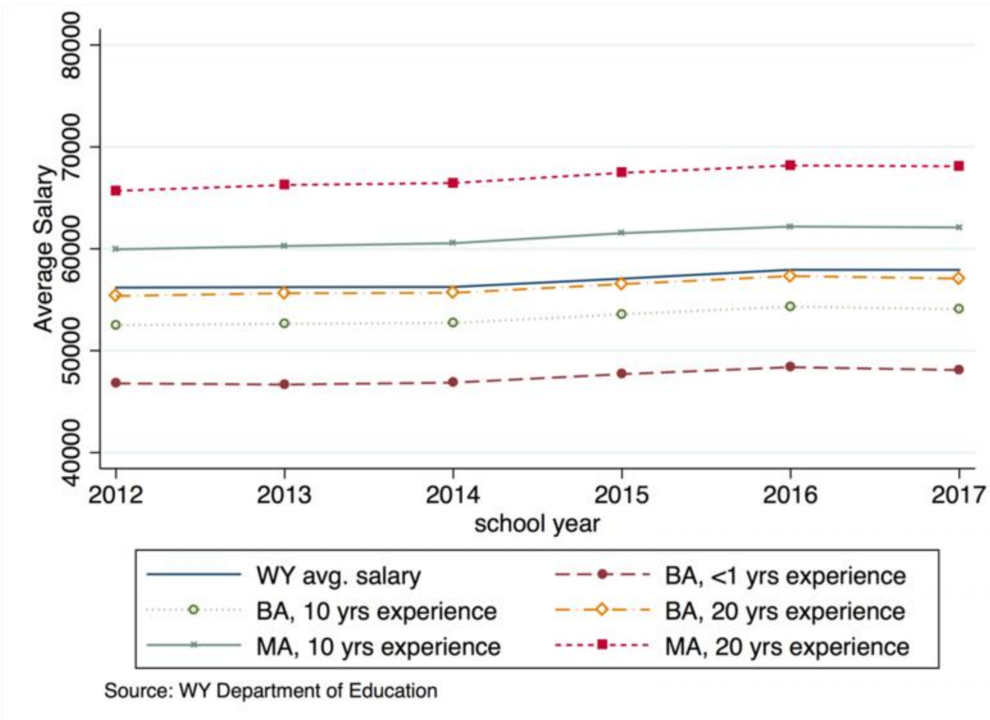
Results. Average teacher salaries have remained fairly flat over the period from 2011-12 to 2016-17 (Figure 1.6). Without any adjustment for inflation or cost of living, teacher salaries have grown from about $56,000 to $58,000, a change of about three percent over the period. Average teacher salaries have consistently been above model salaries (or the salaries identified by the state to be paid out to teachers based on regional cost adjustments). The difference has been fairly consistent across the period.

Figure 1.6
Wyoming Teacher Salaries over Time



One potential explanation for the lack of growth in average teacher salaries over time is that Wyoming has seen a shift in the qualifications and/or experience of teachers over the period. Since teacher salaries are based on education and experience levels, it is possible that what is seen as stagnation in average salaries is actually the result of the teacher workforce becoming less experienced over time due to teacher retirements or other selective attrition. To examine this possibility, we examined teacher salaries after accounting for experience and degree level. The results of this analysis suggest that the stagnation in average teacher salaries over time have been felt uniformly over all degree and experience levels (Figure 1.7).

Figure 1.7
Wyoming Teacher Salaries by Experience and Degree Level Over Time

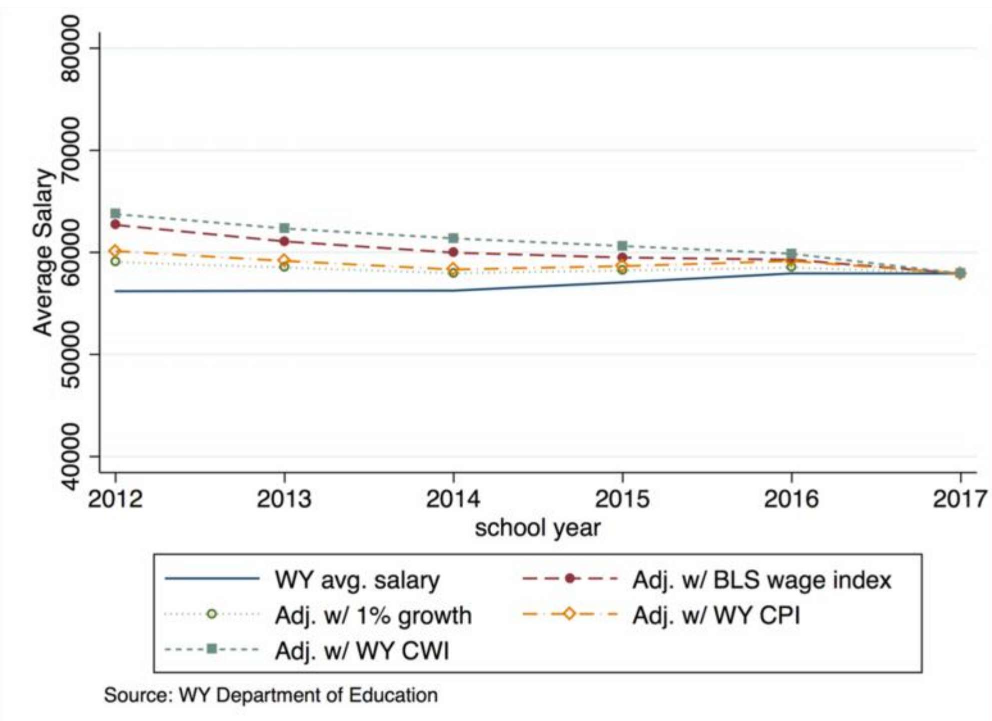


To this point, we have reported nominal teacher salaries, or teacher salaries that have not been adjusted for inflation. One challenge with adjusting for inflation is that it is not clear what the appropriate adjustment should be. The BLS generates national estimates of the consumer price index, but Wyoming could experience inflation or cost-of-living changes that are more or less than what is seen in national numbers. The state of Wyoming also calculates a Wyoming-specific CPI, but even then, it is not clear whether that accurately reflects the purchasing power that workers care about. We explore the real wages of Wyoming teachers based on four alternative assumptions. The first is that we assume the cost of living has gone up one percent per year annually since 2012. This is a conservative assumption since the national CPI figures suggest that inflation has been closer to two percent annually over this period. Alternatively, we use the average wages of professional and technical workers from OES (from Figure 1.5) to calculate a Wyoming comparable wage index (CWI), or simply an index of non-teacher wages. The CWI is anchored to 2011, such that every index value is relative to 2011. For example, a CWI of 1.05 would indicate that professional/technical wages in that year were 105 percent, or five percent above, what they were in 2011. The assumption of the CWI is that other professional/technical wages that are determined in competitive labor markets reflect price pressures and changes in the cost of living. As a third measure, we adjust using the BLS employment cost index, a national wage index similar to the Wyoming-specific CWI but based on national averages of wages.[5] Finally, we use the Wyoming CPI calculated by the Department of Administration and Information Economic Analysis Division.[6]

Figure 1.8 shows what real salaries have done over this period under different assumptions about changes in the cost of living. Even with the most conservative estimates about inflation in Wyoming, teacher salaries that are adjusted for inflation have fallen in real terms over the period from 2011-12 to 2016-17. Assuming a one percent annual inflation rate suggests real salaries have fallen by about two percent since 2011-12. The Wyoming CPI, which produces the most negative picture, suggests salaries have fallen in real terms by about nine percent. Other assumptions about inflation produce estimates between those extremes. In any case, it appears real salaries have fallen over time.

Figure 1.8

Wyoming Teacher Salaries Over Time After Adjusting for Inflation Under Different Assumptions



Summary. Without taking inflation into account, teacher salaries have remained basically flat since 2011-12. This stagnation in the average is not due to a shift in the credentials or experience of teachers

[5] For more information about the employment cost index, visit the BLS's page that describes the indices it calculates: https://www.bls.gov/bls/newsrels.htm

[6] For more information on the Wyoming CPI, visit the Wyoming Department of Administration and Information's page that describes the CPI: http://eadiv.state.wy.us/index.asp

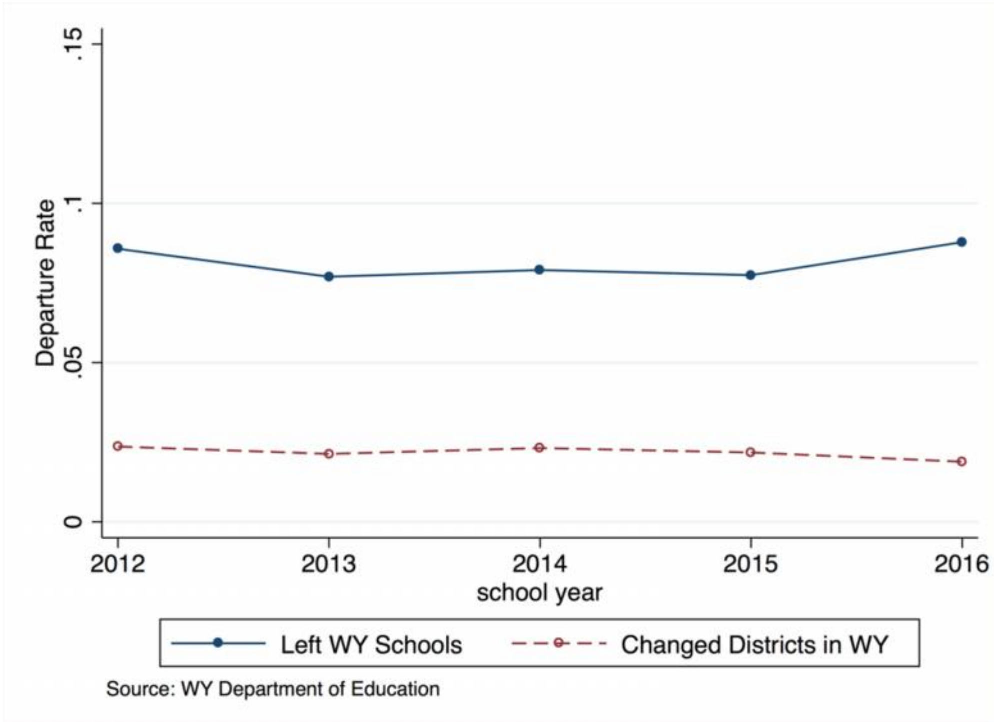
in Wyoming because teachers of all experience and degree levels have remained very flat over time. This stagnation in teacher salaries translates to a decline of between two percent and nine percent in real, or inflation-adjusted, teacher salaries over this period.

3. What do administrative data suggest about the patterns of teacher attrition in Wyoming over time?

One of the key reasons to examine the attractiveness of salaries in Wyoming is because low salaries could cause teachers to exit the profession or, alternatively, to not enter the profession. It is difficult to observe the latter, so in this section we examine teacher departures from schools. We examine teacher attrition in two ways: *movers*, who move to another school district in Wyoming, and *leavers*, who leave the public school system entirely. To calculate these rates, we examine year-by-year teacher placements in the administrative data. Any teacher who is in the data in the next year at a different school district than they were in the previous year is classified as a mover for that year, and any teacher who is not observed in the data the next year after having been in the data the previous year is classified as a leaver. The administrative data go up to the 2016-17 school year, so the last year we can observe whether teachers were movers or leavers is in 2015-16 because we cannot yet observe their placement in 2017-18.

Results. Departure rates have been fairly flat over the time period of the sample (Figure 1.9). There was a slight uptick in departure rates in 2015-16, but we do not have sufficient data to know whether that year was an anomaly or the beginning of a larger trend. Unfortunately, we cannot easily compare turnover rates in Wyoming to neighboring states because we lack the detailed administrative data from neighboring states. Likewise, national estimates of teacher turnover are not available. But, estimates from the most recent national Teacher Follow-Up Study from the National Center for Education Statistics suggest the national annual exit rate for teachers was approximately eight percent, very close to what is seen in Wyoming. These estimates are from the 2011-12 school year, so it is impossible to know how they compare to more recent national levels.

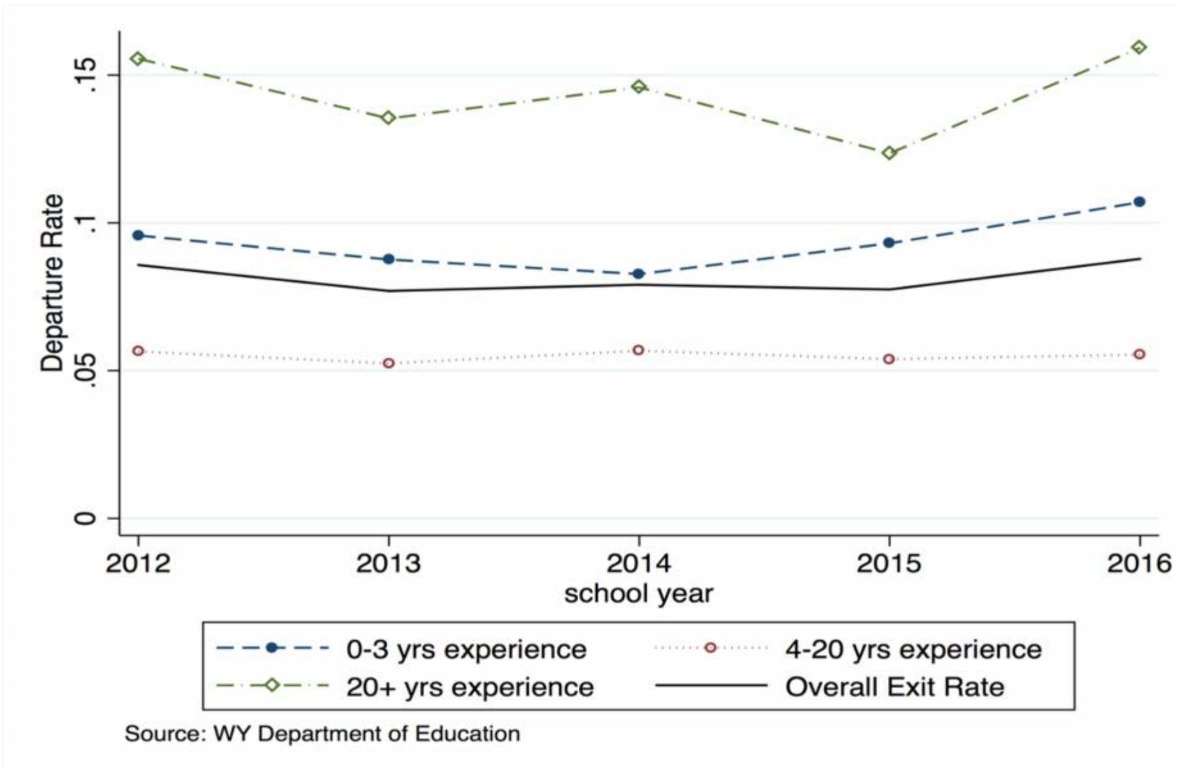
Figure 1.9
Wyoming Departure Rates over Time



Teachers leave the profession for many reasons, and it is difficult to know what the optimal level of turnover should be. Just like most economists agree that the optimal unemployment rate is something above zero, the optimal teacher turnover rate is almost certainly above zero also. For example, it is probably a good thing if some very seasoned teachers exit the profession because they are retiring. Likewise, some less experienced teachers must necessarily exit the profession to find a profession that is a better fit for their skill set and expectations. We might be more concerned, though, if established teachers were leaving the profession at high numbers before they were reaching a natural retirement age. To examine this possibility, we look at teacher turnover rates by experience level.

Figure 1.10 illustrates that a fair number of the departures are by teachers with more than 20 years of experience, which we can likely attribute to relatively higher retirement rates. This group has seen the largest fluctuations in departure rates over this time period. Novice teachers with less than three years of experience leave at a rate of about 10 percent annually. Since 2014, there has been an increase in the number of novice teachers exiting the profession. It is unclear whether this is a natural correction of the decline in exit rates between 2012-14 or whether this is the beginning of a larger trend. Novice teachers have historically had higher exit rates, but it is something Wyoming should continue to monitor. National estimates for novice teachers suggest slightly higher rates of attrition than what is being observed in Wyoming. For example, an analysis of NCES's Beginning Teacher Longitudinal Study (BLTS) found that 10 percent of novice teachers left in their first year, 12 percent did not teach beyond their second year, and 15 percent did not teach beyond the third year (Gray & Taie, 2015).

Figure 1.10
Exit Rates by Teacher Experience Level



Exit rates of teachers with between four and 20 years of experience have remained fairly constant at around five percent, and there is no reason to believe that these teachers have left Wyoming in higher numbers over the last several years. This experience group represents the largest group of teachers in Wyoming, so it is encouraging that this number has remained fairly constant over time.

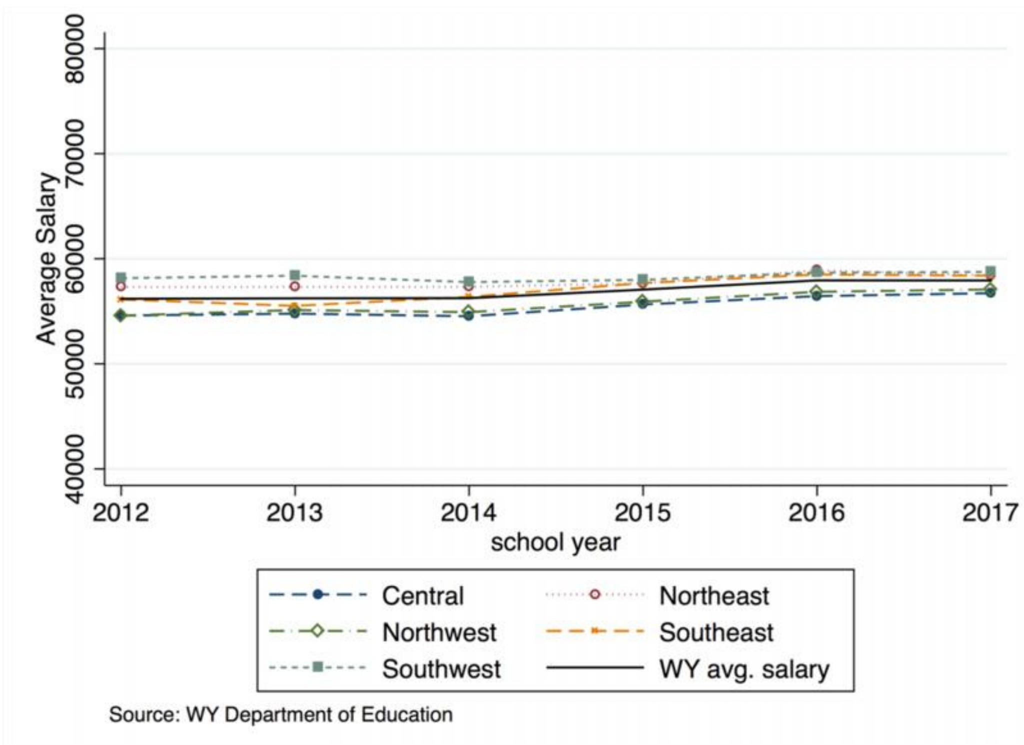
Summary. Teacher departure rates have remained fairly flat over the period of this analysis. There has been a slight increase in the attrition rates of novice teachers, but the rates are not significantly higher than what is seen nationally among novice teachers. Attrition among the largest group of teachers, those with between four and 20 years of experience, has remained very constant at around five percent over the full period.

3. What do administrative data suggest about within-state variation in important measures of the teacher labor force?

For this question, we examined regional- and district-level variation in many of the outcomes we have examined thus far to see whether state-level averages mask important variation within the state across regions and districts. For this analysis, we grouped school districts according to the county in which they are located based on the five regions defined by the Wyoming Department of Workforce Services: Central (Carbon, Converse, Natrona), Northeast (Campbell, Crook, Johnson, Sheridan, Weston), Northwest (Big Horn, Fremont, Hot Springs, Park, Washakie), Southeast (Albany, Goshen, Laramie, Niobrara, Platte), and Southwest (Lincoln, Sublette, Sweetwater, Teton, Uinta).[7]

Results. Salary levels vary by region (Figure 1.11), and the variation has been fairly consistent over time. Specifically, districts in the Southwest region consistently pay the highest salaries and districts in the Central region consistently pay the lowest. The Southeast region stands out somewhat in this regard, however, since it is the only region that has changed relative position over time. In the early years it was close to the state average and relatively close to the Central region, but over time the Southeast has moved to be very close to the highest paying region.

Figure 1.11
Average Teacher Salaries by Region and Year

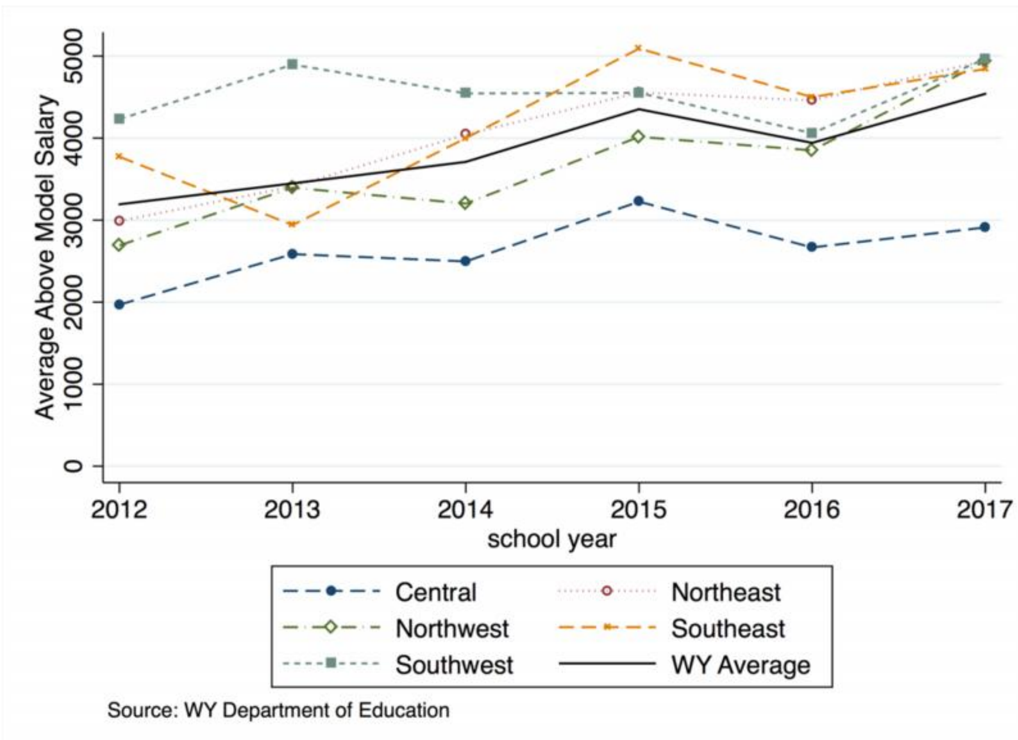


The difference between the lowest and highest-paying regions is roughly $2,000 and $3,600, depending on the year. Some of that difference could be due to differences in teacher characteristics between the regions. After accounting for differences in teacher experience and degree level, the Central region (the lowest-paying region) paid an average of $4,322 less than the Southwest region (the highest-paying region), and the difference was statistically significant.[8]

[7] http://doe.state.wy.us/lmi/0394/0394t1a1.htm
[8] This analysis was done by regressing teacher salary on experience level, degree level, and fully interacted year effects. The model also included region fixed effects, which were used to determine the size and statistical significance of regional pay differentials.

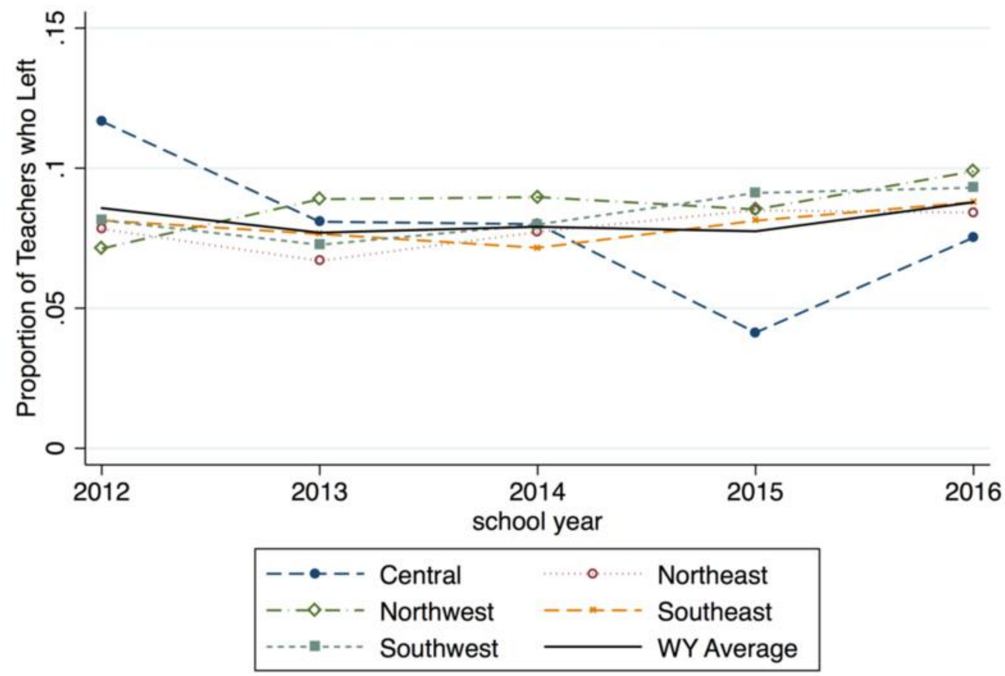
Some of the regional variation in pay could be due to the funding model that allows for regional cost adjustments. We also explored the degree to which districts paid above the funding model salaries to see whether some regions were paying relatively more in order to overcome some disadvantage (real or perceived) in the state funding model. The results indicate that the differences in overall average salary are reflected in differences in payments above the funding model's salaries (Figure 1.12). Consistent with the evidence above, the Central region offers the lowest payments above the funding model's salaries and the Southwest is relatively high. It is also important to note that all the regions pay above the funding model's salary by at least $2,000 and the highest regions pay close to $5,000 above the model salary on average.

Figure 1.12
Payments Above Model Salaries by Region and Year



Regional pay differences could be associated with different teacher turnover rates; although it is not clear which direction the causality would go. For instance, districts with higher pay might have lower turnover because teachers are more satisfied with their salary. Or, districts with lower pay might choose to pay lower because teachers have fewer non-teaching opportunities to leave their schools. Regardless, we examine whether there is evidence that turnover varies significantly by region and find little evidence of significant differences in exit rates (Figure 1.13). The central region has seen the most variation over the time period and has ranged from being the region with the highest turnover to the region with the lowest turnover. Despite a few anomalous observations, regional exit rates track fairly closely with each other and do not reveal substantial regional variation in turnover.

Figure 1.13
Departure Rates by Region



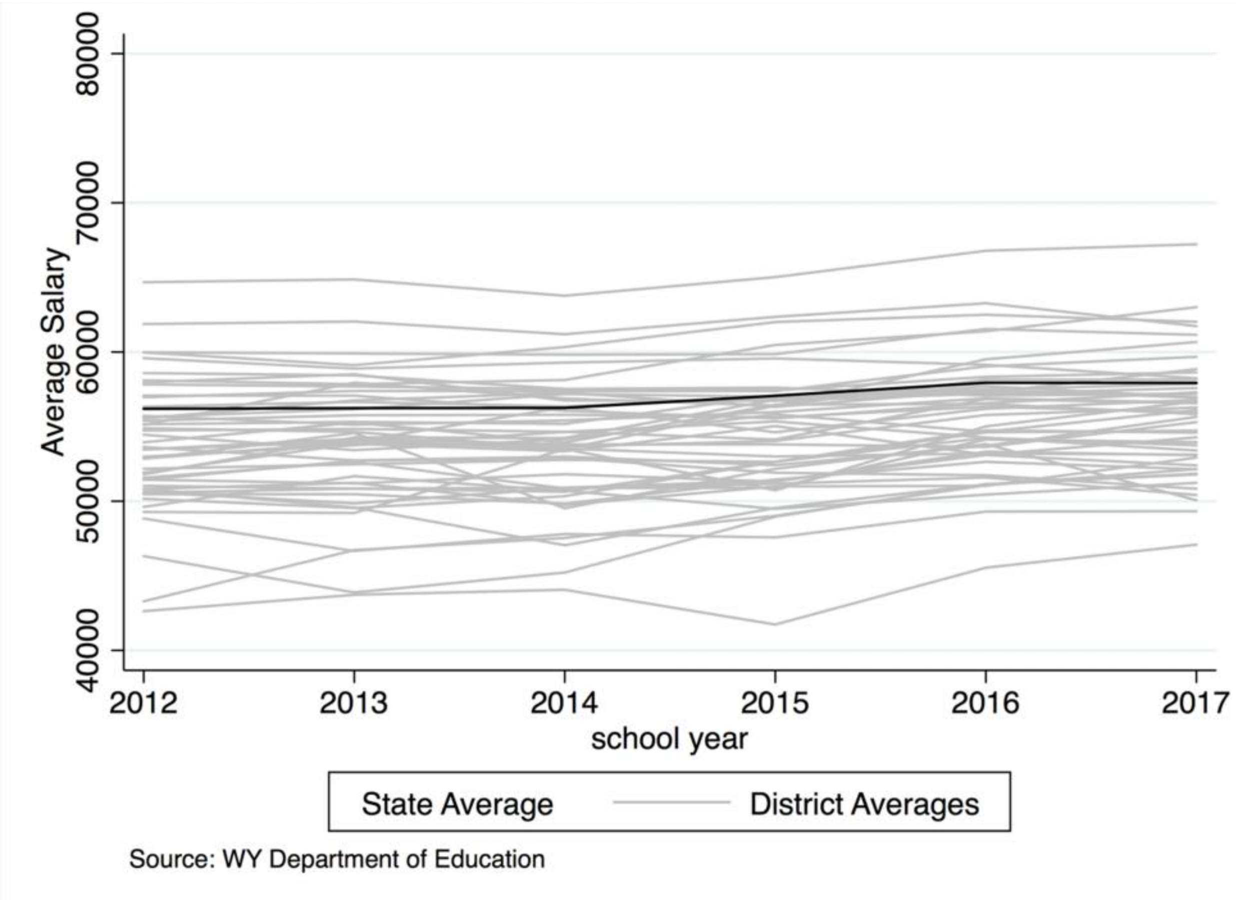
Source: WY Department of Education

The lack of substantial regional variation in teacher turnover might be somewhat surprising to those who suspect other states are effectively luring teachers across the Wyoming border. A teacher who leaves Wyoming teaching could, in fact, be moving to other states to go teach. We would expect that to be a larger problem in regions bordering the relatively high-paying states. However, we do not see evidence of a systematic loss of teachers from any one region.

Even regional variation could mask substantial district-level variation in some of these important outcomes. To explore this, we examined select district-level outcomes to get a sense of the level of variation. These findings should be interpreted cautiously since districts have relatively small sample sizes in any given year and therefore might be influenced by a few outliers.

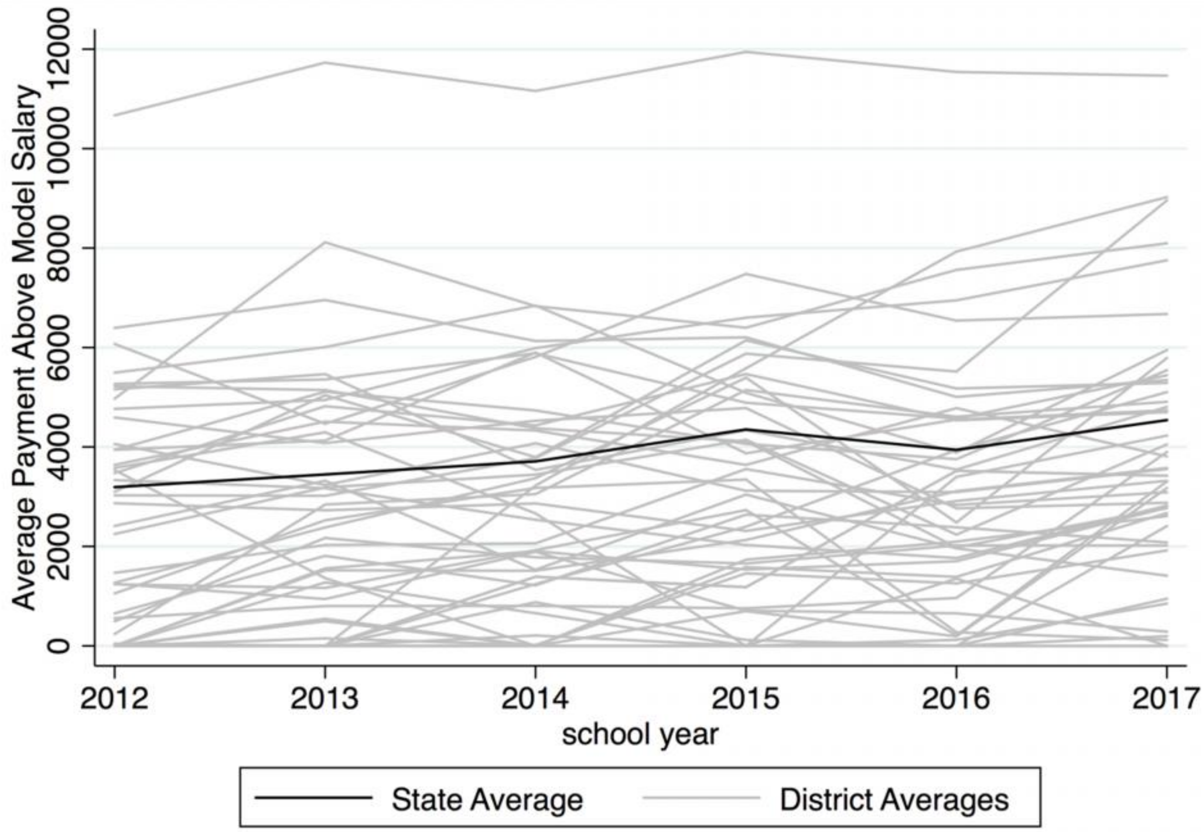
District-level measures of average salary illustrate substantial district-level variation in salary levels (Figure 1.14). The lowest-paying district is around $45,000 while the highest paying district is nearly 50 percent higher at around $65,000. Most districts are clustered between $50,000 and $60,000, which still suggests a substantial $10,000 difference between districts. Because some of this difference is due to differences in teacher characteristics between districts, we also examined the difference after accounting for teacher experience and degree level. After making those adjustments, the lowest-paying district paid about $18,000 less than the highest-paying district in the state. This suggests that if a teacher left the highest-paying district and took a job in the lowest-paying district, he or she would take a nearly $20,000 pay cut.

Figure 1.14
Average Salaries by District over Time



There is substantial across-district variation in the degree to which districts pay teachers above the model salary (Figure 1.15). Some districts are at essentially zero, paying teachers at the model salary, while the most extreme is a district that pays nearly $12,000 above the model salary. Minus that outlier, most pay less than $7,000 above the model salary, but most also pay nonzero amounts above the model salary.

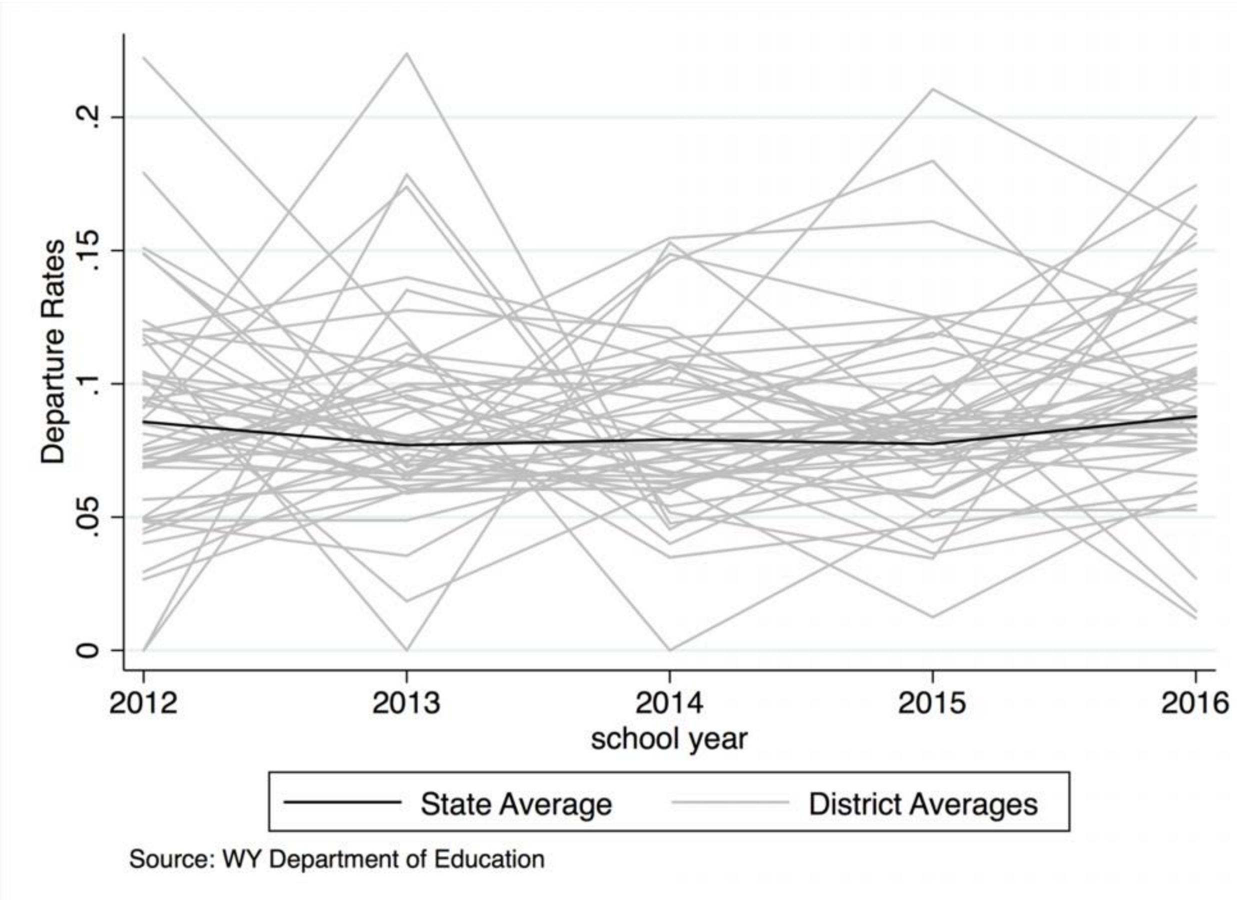
Figure 1.15
Payments Above the Model Salary by District over Time



Source: WY Department of Education

Substantial variation in pay across districts could suggest large differences in teacher turnover across districts. The picture for this analysis is less clear because there is significant year-to-year variation in turnover rates within districts (Figure 16). But, the variation itself is telling. No district in the state consistently has a 20 percent or even a 15 percent exit rate. All of the districts that had years with an exit rate above 15 percent also had years with rates below 10 percent. Because many districts are small and a few teachers can make a difference in exit rates, it is not surprising that there are jumps from one year to the next. It is reassuring that no district is consistently plagued by high teacher exit rates. Although not shown, we also did the analysis with teacher move rates (i.e. the rate at which they move from one school district to another) and found no systematic differences between districts in the rate at which teachers move from their district to other districts.

Figure 1.16
Teacher Exits by District



As a final check, we analyzed the correlation between a district's turnover rate (measured separately as the teacher exit rate and the teacher move rate) and the salary paid in that district. The correlations were small and positive, but were not large enough that we could rule out that they arose by chance.

Summary. Regional differences in teacher pay do not correlate with regional differences in teacher exits. There is also substantial district-level variation in teacher pay, but there is little evidence to suggest that districts are plagued with higher exit or move rates. We cannot rule out the possibility that moves are being prevented by the districts that pay a higher salary, but there is no evidence of a negative correlation between turnover rates and salary levels.

Conclusion

Wyoming pays teachers more than other states do, either nationally or regionally, but there has been substantial stagnation over the last five years in teacher salaries. If Wyoming aims to retain its advantage over neighboring states, it should adjust teacher salaries upward by at least two percent to maintain levels comparable to where they were in 2011-12.

The degree to which districts pay teachers above the model salary suggests that they believe the model salary is insufficient to attract and retain high-quality teachers. While we cannot expressly rule that out, the current data do not suggest Wyoming has a big problem with teacher attrition and there is no evidence of substantial movement across districts within the state. However, this could be the result of high salaries being paid by districts, and we cannot know for certain what it would look like if districts were paying at the model salary level.

State averages mask substantial variation in the state. Some districts pay well above others. There is currently an $18,000 pay gap between the lowest- and highest-paying districts, even after accounting for possible differences in the types of teachers who work in the districts. We do not have evidence that points to marked differences in retention rates across districts, and we were unable to identify any evidence that teacher salary levels were correlated with teacher turnover.

We were unable to examine teacher benefits in this analysis, but economic research suggests employees often do not factor benefits into their compensation, and so an analysis with benefits would be unlikely to show substantially different results in terms of the relationship between overall compensation and turnover or attrition.

Since about 2005, Wyoming has been strong in terms of teacher salary. If it aims to retain its advantage over states in the region, we recommend increasing the model salary to do so.

II. Regional Cost Adjustment

Overview

The state of Wyoming seeks to adjust teacher salaries to adjust for regional cost differences across the state, recognizing that purchasing power might be different depending on where the teachers reside. Taylor (2015) examined options for adjusting teacher salaries in Wyoming based on modified versions of the Wyoming Hedonic Wage Index and the Wyoming Cost-of-Living Index. Ultimately, she advocated for the development of a comparable wage index (CWI) in which non-teaching wages in the state are used to calibrate teacher salaries by county. The advantage to this approach is that it is a market-based approach that relies on fewer researcher assumptions about the tradeoffs workers are making between community amenities and wages. We agree with Taylor's (2015) recommendations that Wyoming adjust teacher salaries according to a comparable wage index of market-determined, non-teaching wages in each county. This method was also recommended by Taylor (2006) in a U.S. Department of Education report.

We conducted the analysis in Wyoming to determine the index values that could be used to adjust teacher wages in each district. We used the National Bureau of Labor Statistics' Occupational Employment Survey (OES) data, which is available from the Wyoming Department of Workforce Services for every county in Wyoming, to calculate how non-teaching salaries compare in each Wyoming county. Using a multivariate regression, we estimated the degree to which the non-teaching salaries in each county were above or below the state average. These estimates were then converted to an index that was averaged at 100. With such an index, the values for each county can be interpreted as the percentage of the state average. For example, if a county is assigned an index value of 94, it implies non-teaching workers in that county earn, on average, 94 percent of what average workers in the state receive in the same occupation. Likewise, a county with an index of 105 suggests that workers in that county earn 105 percent of the state average salary in their occupation.

The results of our analysis produced a range of estimates from 87 to 119. These results suggest that the county with the lowest CWI had non-teaching wages that were 87 percent of the state average, and the county with the highest CWI had non-teaching wages that were 119 percent of the state average. These index values were comparable to the index values calculated by Taylor (2015), which ranged from 89 to 115. The largest change for any district between the two years was in Platte County, which increased 10 percentage points from 91 in 2015 to 101 in 2017.

Wyoming statute currently requires that the regional cost adjustments (RCA) cannot be lower than 100 (the statewide average) for any district. Given this requirement, we present the adjusted CWI where values less than 100 are adjusted to equal 100. This adjustment results in just eight counties (corresponding with 15 school districts) with index values that would require an adjustment. With the appropriate readjustment in 2015 and 2017, the net change between the two years is positive for eight counties and is not negative for any Wyoming county.

Recommendations

We agree with Taylor's (2015) recommendation that the state adjust teacher salaries according to a comparable wage index (CWI). This approach uses the wages of non-teaching professionals as a benchmark for what teacher wages would be if they were determined in competitive labor markets. The greatest challenge schools face in getting high-quality teachers is attracting them to teaching instead of pursuing other job opportunities. This approach accounts for the attractiveness of non-teaching jobs, sometimes referred to as the opportunity cost, that teachers weigh when they choose to teach.

The key advantage of the CWI over the Wyoming Cost of Living Indices (WCLI) and the 2005 Hedonic Wage Index (HWI) is its simplicity. The CWI approach relies only on the assumption that wages for non-teaching professionals, which are determined through numerous negotiations between employers and employees in competitive labor markets, appropriately reflect the complex interaction of cost of living and the attractiveness of an area's amenities. Unlike the HWI, the CWI is also easily understood by a non-technical audience because, while there are important but relatively minor statistical adjustments to ensure teachers and non-teachers have comparable characteristics, it ultimately reflects the average wage of non-teaching professionals in each region. Regions where non-teaching professionals, such as managers and executives, earn relatively higher salaries will be allowed to offer higher salaries for teachers than regions in which non-teaching professionals earn less.

As with Taylor (2015), we also recommend the state use the full index to adjust the salaries in each county. The current RCA approach moves the majority of districts to the statewide average because the minimum index value for any district is the base of 100. This results in overpayment of some teachers in lower-paying counties. The harm in this approach is that these overpayments reflect state money that could be used for other educational investments.

Limitations and Options

As described in Taylor (2015), the CWI has some limitations that are worth noting. First, the CWI is calculated at the county level and might mask important within-county differences in wages. Without finer grained estimates of comparable wages within counties, there is no obvious improvement that can be done to overcome this limitation.

Second, the wages reported in OES are measured with some error and are, in some cases, based on relatively small sample sizes. The resulting wage index may be sensitive to the small sample sizes. Indeed, three of the counties with the largest changes in index values between 2015 and 2017 were also three of the smallest counties. To account for this limitation, we suggest averaging the CWI over three to five years as a way to smooth estimates. The Wyoming OES data itself is an average of multiple years of data, but averaging the CWI over multiple years (for example, a three-year moving average) will decrease the volatility of estimates.

Regional Cost Adjustments for Wyoming School Districts

Wyoming, as with all states, faces different regional costs of hiring and retaining high-quality teachers. The challenge Wyoming faces is to account for those differences accurately without unintentionally advantaging some districts over others. Given the realities of state budget constraints, it must be acknowledged that every dollar that goes to support one district is a dollar that is not being spent to support a different district.

The state currently adjusts costs between districts according to the larger of the HWI, the WCLI, or the state average index value of 100. Each method has its limitations, so districts may be inappropriately penalized by one or the other. While we recognize that this contingency plan is based on a number of political factors and compromises, the effect is an opaque RCA that is potentially subject to manipulation.

In the previous recalibration effort in 2015, Taylor compared the potential RCA models and recommended the state adopt a comparable wage index (CWI) as the sole model by which costs would be adjusted between districts. She outlined many of the limitations with the current approach, and in the interest of space we will not recite all her objections.[9] Below, we briefly outline some of the key concerns about the current system that we share with Dr. Taylor.

Hedonic wage models have been shown to have very limited validity in public school settings because they build off entrenched, non-competitive salaries (Goldhaber, Destler, & Player, 2010). Hedonic wage models are also subject to district manipulation if the statistical model does not appropriately account for factors that are within the district's control. As pointed out by Taylor, the HWI has the potential to confuse high-spending districts with high-cost districts, potentially exacerbating inequities by subsidizing more affluent, higher-paying districts.

A cost of living index (CLI) has the advantage that it is not dependent at all on the decisions districts make, and therefore is not subject to manipulation,[10] but it is not without its limitations. A CLI is sensitive to the basket of goods that is included, and it is not always clear how these goods should be weighted in the calculation. It is therefore subject to some substantial discretion by the researcher who calculates it, which consequently opens it to substantial critiques.

Another disadvantage of the CLI is reflective of prices but not necessarily amenities. Prices reflect supply and demand, and a CLI has the potential to inappropriately reward areas with high amenities. For example, urban areas are often more desirable for young people because they have opportunities for spousal employment and education, entertainment, and other lifestyle amenities. Urban areas also tend to have higher home prices because of the demand to live there. In contrast, remote rural areas tend to have lower housing prices due to lower demand, but they also lack many of the amenities that are attractive to potential teachers. A CLI in which housing is a large proportion would shift payments toward the urban district. However, all else being equal, teachers might actually be willing to earn less

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[9] Interested readers may find Taylor's report, which was included as Appendix E of the 2015 Recalibration *Report to the Legislature*, at
http://legisweb.state.wy.us/LSOWeb/SchoolFinance/20160115SchoolFinanceRecalibrationReport.pdf.

[10] This assumes that the school district is a small enough employer that it does not influence the cost of living in an area.

and live in the urban area than in the remote rural area. In this scenario, the rural area has a higher cost of attracting teachers because it must compensate teachers for the lack of amenities in the area (e.g. the lack of attractive employment for a spouse or partner). But, an RCA based only on a CLI would allocate more to the urban district and further disadvantage the rural district.

The CWI is based on the wages of employees in each area. Most wages are determined in labor markets in which employers must compete for employees. In competitive markets, the wages are determined as the equilibrium value based on many negotiations between employers and employees. On average, they will simultaneously reflect the cost of living and the availability of local amenities. In competitive labor markets, employers who try to underpay will face competition from other employers and be forced to raise wages to the competitive level. This is not always the case for public employees, such as teachers, where wages may be subject to regulation and determined in non-competitive settings. The CWI has the advantage of applying competitive labor market values to a non-competitive setting.

The other advantage of this approach is that it explicitly accounts for the wages of jobs teachers could be taking if they were not teaching. Economists refer to this as the teachers' opportunity cost. One of the primary motivations for regional cost adjustments is that districts in each locale need to be responsive to their teachers' opportunity costs so they can attract and retain the best teachers. The CWI recognizes the attractiveness of other jobs in the area and adjusts costs accordingly.

The third advantage to the CWI is that it is transparent and subject to little researcher subjectivity. It is much easier for districts and schools to understand how the CWI is calculated than a HWI or a CLI. Transparency is often a key lever to get buy-in from the diverse set of stakeholders who stand to gain and lose from the RCA.

In the sections below, we calculate the CWI for Wyoming. We use the same method proposed by Dr. Taylor in the most recent recalibration report, described briefly below, and compare our current numbers with her calculated numbers. We conclude with some implementation recommendations.

Data and Method

The calculation of the CWI depends on accurate data on non-teacher wages at a local level. The U.S. Bureau of Labor Statistics (BLS) generates annual OES, which include the number of people and the average earnings of workers in over 800 occupations at the national, state, metropolitan, and nonmetropolitan statistical area level.[11] The Wyoming Department of Workforce Services supplements the federal OES data collection to produce county-level employment statistics averaged over three years to account for the relatively small sample sizes within some counties.[12] For simplicity, we refer to these as OES data, although the data used for this analysis are from the Wyoming Department of Workforce Services and are not official BLS data.

[11] For more information on the OES, please see the OES website: https://www.bls.gov/oes/

[12] For more information on Wyoming OES data collection, please see Occupations, Earnings, and Wages page of the Wyoming Department of Workforce Services web page: http://doe.state.wy.us/lmi/oes.htm

The calculation of the CWI is straightforward. We use statistical adjustments to measure how much each county pays, on average, more or less than other counties in the state for each occupation.[13] For example, if a county pays lawyers $10,000 more than the average lawyer is paid in the state and the county pays managers $5,000 more than the average manager, then this county would be paying, on average, $7,500 more than other counties in the state. When we include all occupations, weighted by the number of people in that occupation in the county, the index reflects the overall average payment above or below the state level.

After calculating the average differential payment for all non-teachers in each county, we predict the average non-teaching salary for each county and set the state average predicted salary to 100. Each county is then assigned an index value based on how their predicted non-teacher wage in that county compares to the state average. For example, if the state average salary is $50,000 and a county's average is $55,000, that county would be assigned a CWI of $100 \times \left(\frac{55{,}000}{50{,}000}\right) = 110$. This index value can be interpreted to mean that non-teacher wages in that county are 110 percent of, or 10 percent above, the state average. The RCA would then provide that district with 10 percent above the average determined adjustment.

There is some question as to whether the CWI should include the wages of all employees or only the employees that are similar to teachers. The justification for limiting it to just those occupations that are similar to teaching is that some non-teaching occupations, such as construction, might be less appealing to teachers. However, we argue that the CWI should include all occupations for two reasons. First, at a practical level, the precision of the CWI is strongest when it reflects the average of as many labor market transactions as possible. Limiting the sample to a subset of those transactions could introduce measurement error, particularly in low-population counties. Second, it is not always clear what is a comparable occupation to teaching. For example, if one area is paying construction workers very high wages, some teachers will find that to be an attractive alternative to teaching. Limiting the sample to comparable employees introduces additional researcher discretion into the calculation that could open the analysis to more criticism. Nonetheless, we recognize the possibility that a county may be dominated by a sector that pays well below the state average for reasons we cannot observe, and the effect would be to penalize the teachers in that county. To allow for this possibility, we also calculated the index restricting the OES data to the subset of occupations that is most like teaching based on job description and required education: management; business; computers and mathematics; architecture; science; community and social services; legal; training; arts, design, entertainment, sports, and media; and healthcare. The results were qualitatively similar. However, due to significantly reduced sample size and subsequent precision, we agree with Taylor's 2015 recommend that the index be based on the full set of occupations.

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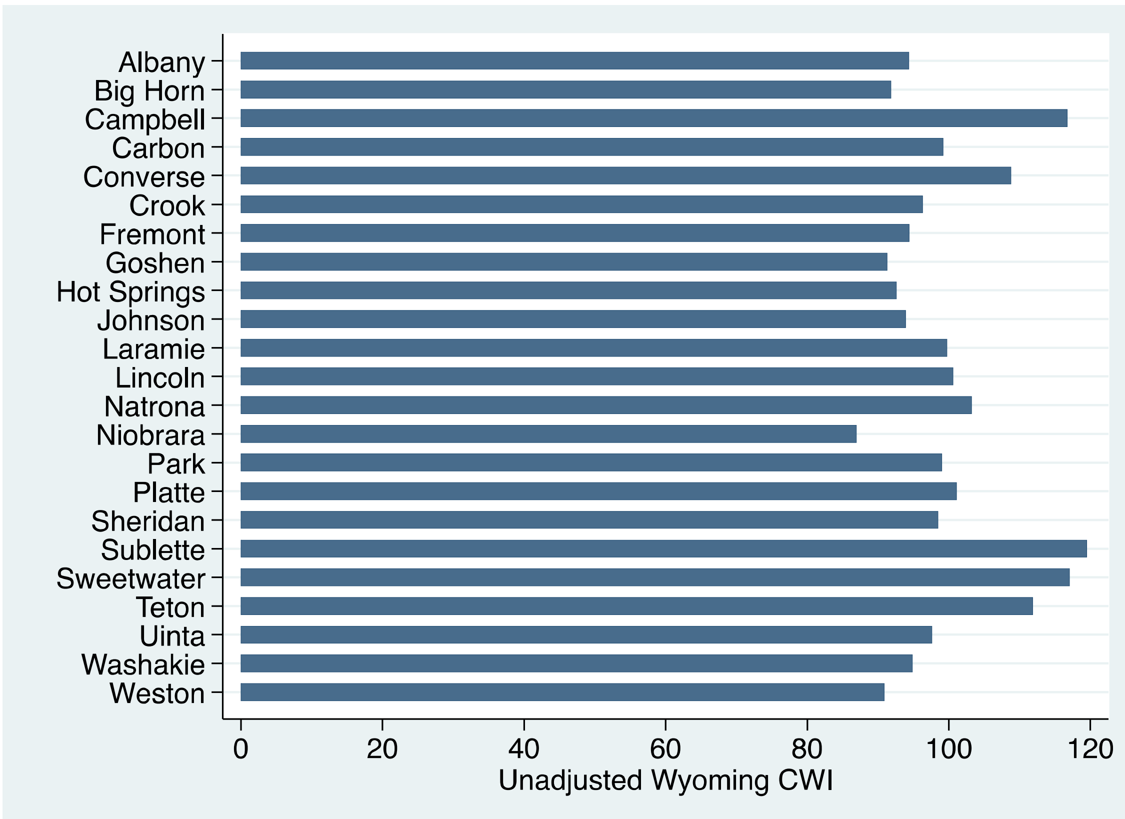
[13] In practice, we do this by running a weighted regression of the average wage on a series of occupation and county fixed effects. The coefficients on the county fixed effects are then used to calculate the index values. We also used median annual wages and found no discernible differences in the results.

Results

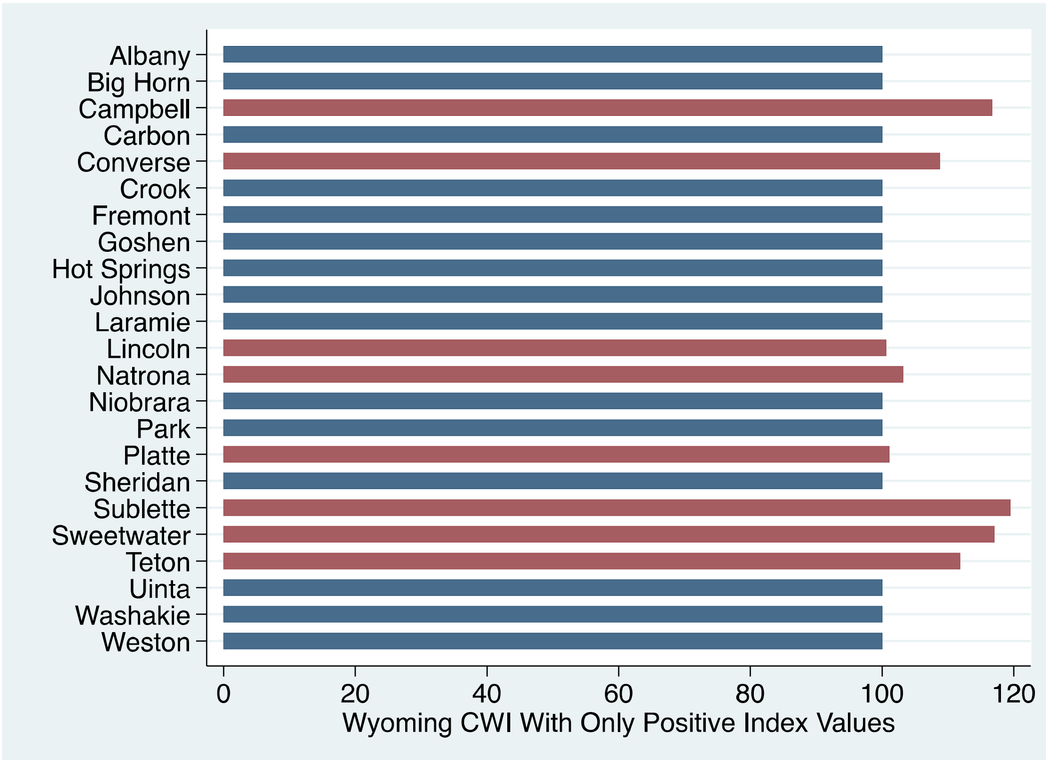
The state average predicted salary for all non-teaching positions is approximately $45,600. The county-level averages range from roughly $39,000 to $54,000, translating to index values ranging from 87 to 119, meaning the range of county-level non-teaching wages ranges from 87 percent of the state average to 119 percent of the state average (Figure 2.1). The index is highest in the southwest region of the state and relatively low in the far eastern part of the state.

Figure 2.1
Unadjusted CWI by county in 2017



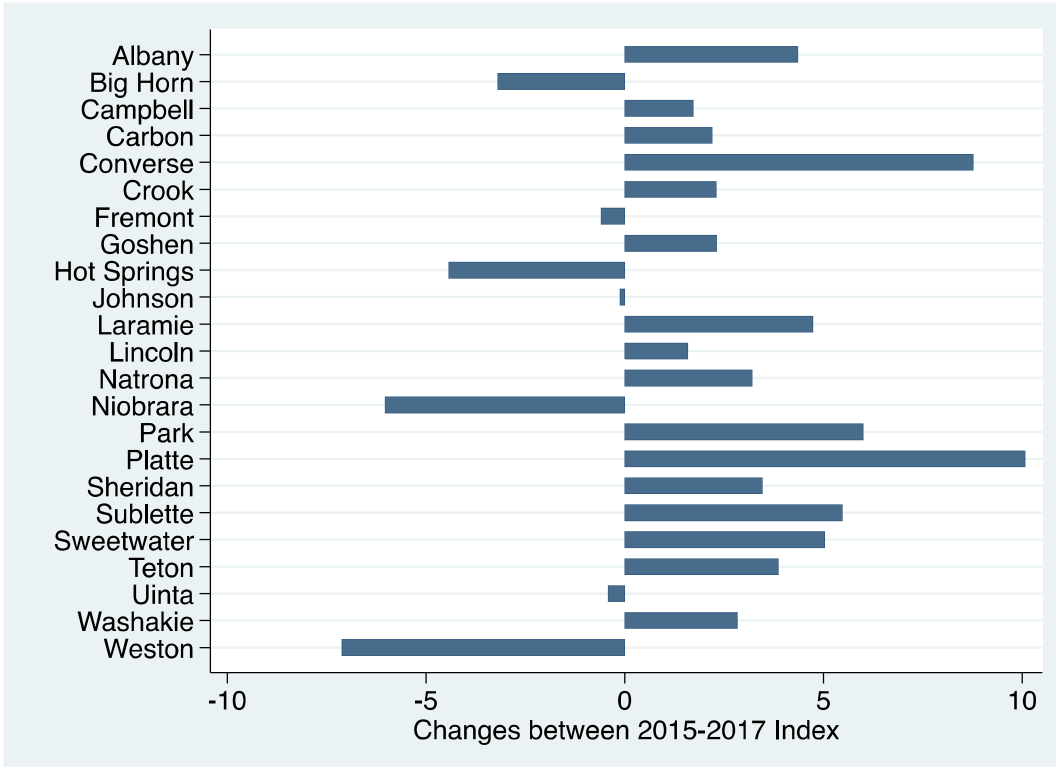
The current RCA method does not allow any districts to be below 100. If that were implemented with the CWI, only 13 districts in eight counties in the state (Campbell, Converse, Lincoln, Natrona, Platte, Sublette, Sweetwater, and Teton) would receive a regional cost adjustment and all others would be at the same level (Figure 2.2). In our view, this does not accomplish the goal of the RCA because the additional salary that is provided to districts with low CWI is money that could be spent in other ways. If the state is worried about inequities, one compromise could be to round each county's CWI up to the nearest five (i.e. everything below 90 becomes 90, everything between 91 and 95 becomes 95, etc.). This would reduce the variability in index values across the state and would also reduce the potential overpayments to districts with index values well below the state average.

Figure 2.2
2017 CWI Adjusted So No County Has an Index Value Less than 100



We contrast our CWI with the CWI proposed by Lori Taylor and find that most counties did not change by more than five points on the scale between the two years (Figure 2.3). The correlation between the two years is quite high (0.87), suggesting that the index values are fairly stable over the three-year time span in which they were run. If the index is not allowed to fall below 100, even fewer changes result.

Figure 2.3
Net Changes in Index Values Between 2015 and 2017



We recognize that volatility is not a desirable feature of any RCA because district wages cannot easily be adjusted from year to year. In fact, the RCA probably moves much more than actual wages do because it is based on a sample, often a relatively small sample, in each district. To illustrate this, the largest changes in CWI between 2015 and 2017 were seen in some of the counties with the fewest workers (Figure 2.4). One desirable feature of placing a minimum on the index value at 100 is that it reduces volatility (Figure 2.5). Another option to reduce volatility is to have each year's RCA be a moving average of three years of the CWI. By design, this would minimize volatility and allow for slower adjustments over time. Using the average of Lori Taylor's CWI from 2015 and our CWI from 2017, the averages produce a range of CWI's from 90 to 116.5.

Figure 2.4

Relationship Between Changes in CWI and Total Workers on which OES are Based

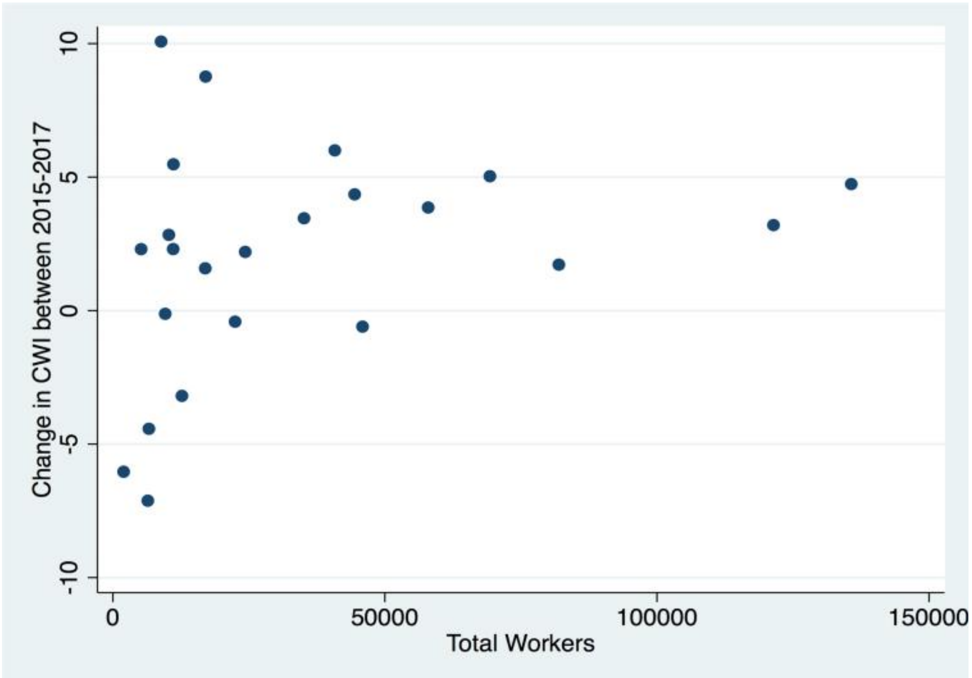
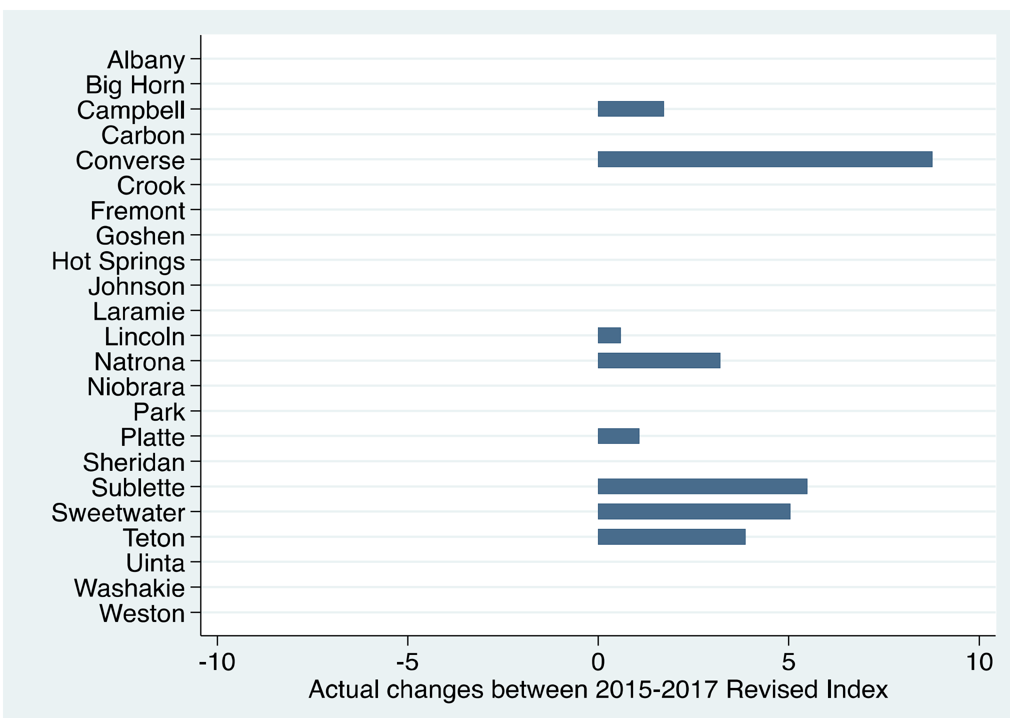


Figure 2.5

Changes in Index Values Between 2015 and 2017 Using Minimum Index Value of 100



As a final check, we analyzed the index values restricting the calculation to occupations most similar to teaching: management; business; computers and mathematics; architecture; science; community and social services; legal; training; arts, design, entertainment, sports, and media; and healthcare. The resulting index was correlated at 0.81 with the unadjusted index including all occupations. However, the sample size was reduced substantially, raising concerns that the reduction introduces substantial measurement error. We recommend the state use the full sample of employees, but the limited sample is very comparable but likely more volatile over time. Both indices are reported in Table B1 in Appendix B. A list of the specific occupation titles within each occupation area is presented in Table B2 in Appendix B.

Table 2.1 presents the current 2018 RCA measures - the HWI and WCLI, and the actual RCA used for adjusting salaries in each school district - and the unadjusted and adjusted 2017 CWI. The CWI in thirteen districts exceeds 1.00 (or 100), Campbell #1, Converse #1, Converse #2, Lincoln #1, Lincoln #2, Natrona #1, Platte #1, Platte #2, Sublette #1, Sublette #2, Sweetwater #1, Sweetwater #2, and Teton #1. These 13 districts would receive a cost adjustment if an adjusted CWI (with the minimum index set at 1.00) was used as the RCA. The CWI for Laramie County #1 and #2 equals 1.00.

Table 2.1

Comparison of Current Regional Cost Adjustment Measures and the 2017 CWI

District Name	2005 Hedonic Wage Index	WCLI	WCLI with 1.00 Minimum	RCA Adjustment Used in Model	Unadjusted 2017 CWI	Adjusted 2017 CWI with 1.00 Minimum
Albany #1	1.01	0.97	1.00	1.01	0.94	1.00
Big Horn #1	0.98	0.90	1.00	1.00	0.92	1.00
Big Horn #2	1.00	0.90	1.00	1.00	0.92	1.00
Big Horn #3	0.99	0.90	1.00	1.00	0.92	1.00
Big Horn #4	0.99	0.90	1.00	1.00	0.92	1.00
Campbell #1	1.06	1.05	1.05	1.06	1.17	1.17
Carbon #1	1.01	1.02	1.02	1.02	0.99	1.00
Carbon #2	0.98	1.02	1.02	1.02	0.99	1.00
Converse #1	0.96	1.05	1.05	1.05	1.09	1.09
Converse #2	0.94	1.05	1.05	1.05	1.09	1.09
Crook #1	0.97	0.94	1.00	1.00	0.96	1.00
Fremont # 1	1.03	0.98	1.00	1.03	0.94	1.00
Fremont # 2	1.02	0.98	1.00	1.02	0.94	1.00
Fremont # 6	1.00	0.98	1.00	1.00	0.94	1.00
Fremont #14	1.04	0.98	1.00	1.04	0.94	1.00
Fremont #21	1.03	0.98	1.00	1.03	0.94	1.00
Fremont #24	0.99	0.98	1.00	1.00	0.94	1.00

District Name	2005 Hedonic Wage Index	WCLI	WCLI with 1.00 Minimum	RCA Adjustment Used in Model	Unadjusted 2017 CWI	Adjusted 2017 CWI with 1.00 Minimum
Fremont #25	1.00	0.98	1.00	1.00	0.94	1.00
Fremont #38	1.02	0.98	1.00	1.02	0.94	1.00
Goshen #1	0.95	0.89	1.00	1.00	0.91	1.00
Hot Springs #1	1.00	0.91	1.00	1.00	0.93	1.00
Johnson #1	1.02	0.99	1.00	1.02	0.94	1.00
Laramie #1	1.06	1.01	1.01	1.06	1.00	1.00
Laramie #2	0.95	1.01	1.01	1.01	1.00	1.00
Lincoln #1	0.97	0.92	1.00	1.00	1.01	1.01
Lincoln #2	0.98	0.94	1.00	1.00	1.01	1.01
Natrona #1	1.06	1.00	1.00	1.06	1.03	1.03
Niobrara #1	0.94	0.89	1.00	1.00	0.87	1.00
Park # 1	1.03	0.96	1.00	1.03	0.99	1.00
Park # 6	1.04	0.96	1.00	1.04	0.99	1.00
Park #16	1.01	0.96	1.00	1.01	0.99	1.00
Platte #1	0.95	0.89	1.00	1.00	1.01	1.01
Platte #2	0.93	0.89	1.00	1.00	1.01	1.01
Sheridan #1	0.98	1.00	1.00	1.00	0.98	1.00
Sheridan #2	1.07	1.00	1.00	1.07	0.98	1.00
Sheridan #3	0.99	1.00	1.00	1.00	0.98	1.00
Sublette #1	1.06	1.07	1.07	1.07	1.19	1.19
Sublette #9	1.03	1.07	1.07	1.07	1.19	1.19
Sweetwater #1	1.05	1.00	1.00	1.05	1.17	1.17
Sweetwater #2	1.04	1.00	1.00	1.04	1.17	1.17
Teton #1	1.18	1.38	1.38	1.38	1.12	1.12
Uinta #1	0.99	0.93	1.00	1.00	0.98	1.00
Uinta #4	0.99	0.93	1.00	1.00	0.98	1.00
Uinta #6	1.00	0.93	1.00	1.00	0.98	1.00
Washakie #1	1.01	0.90	1.00	1.01	0.95	1.00
Washakie #2	0.96	0.90	1.00	1.00	0.95	1.00
Weston #1	0.94	0.92	1.00	1.00	0.91	1.00
Weston #7	0.94	0.92	1.00	1.00	0.91	1.00

Conclusion

We agree with Taylor's (2015) recommendation to the legislature that the state adjust teacher salaries according to a comparable wage index (CWI). This approach is simple and transparent, and it relies on fewer assumptions about how costs should be considered. The greatest challenge schools face in getting high-quality teachers is attracting them into teaching instead of other available occupations. This approach accounts for the attractiveness of non-teaching jobs, sometimes referred to as the opportunity cost, that teachers weigh when they choose to teach.

As with Taylor (2015), we also recommend the state use the full index to adjust the salaries in each county. The current RCA approach moves the majority of districts to the average level because the minimum index value for any district is the base of 100. This results in overpayment of some teachers in lower-paying counties. The harm in this approach is that these overpayments reflect state money that could be used for other educational investments.

The updated index we calculated is very similar to Taylor's calculation, suggesting stability in the estimates. However, we do recognize that the current CWI has more fluctuation than is likely desirable for practical implementation. This is a limitation that can be worked with by either averaging over several years or by rounding the index values into finite bins (e.g., 90, 95, 100, etc.). Either approach would reduce year-to-year volatility but still allow for meaningful differences in the cost of education to be realized across the state.

III. External Cost Adjustment

Overview

The effect of inflation on different education resources varies within Wyoming, and the state should continue to use specific indices to reflect the differential inflationary pressures on the elements that influence the cost of education. After reviewing the current model and the recommendations of Taylor from the 2015 recalibration report, we recommend the state continue to use the ECA approach, as outlined in Taylor (2015). Specifically, we recommend the state use two comparable wage indices (CWI) to account for growth in labor costs over time. We also recommend the state use updated metrics published by the Bureau of Labor Statistics to account for the costs of other inputs, such as office supplies and utilities. These statistics are readily available on an annual basis, so we recommend the state update these cost calculations each year.

External Cost Adjustments for Wyoming Districts

The largest cost in any school or district's budget are the costs associated with wages and benefits, but a district incurs many other significant costs, such as transportation, utilities, maintenance, and educational materials, such as paper and office supplies. The challenge is that these costs vary within the state and the different components of cost might change at different rates over time. For example, wages may grow over time at a much different rate than the prices of other inputs, such as paper or electricity. The state must appropriately adjust for differential inflationary pressures over time if they are to keep educational opportunities equitable for all students in Wyoming.

To address these challenges, since 2012 Wyoming has used four different indices, one each for the four major cost components of the funding model: professional salaries, classified salaries, instructional materials, and utilities to monitor inflation and make appropriate cost adjustments.

The Legislature also adopted a process for monitoring the cost-basis of the funding model that uses state, regional and national data to assess the potential cost pressures in the four major resource areas (professional staff, non-professional staff, supplies and materials, and energy). The process includes the four indices shown above; a set of indicators for each of the four cost areas, such as trends in teacher labor markets, district hiring and teacher turnover; and an annual analysis of district resource utilization compiled by WDE. Results of this monitoring process are used to determine whether an inflation adjustment is needed in any of the four cost areas and the appropriate level of the adjustment.

In 2015, Taylor recommended Wyoming continue to use multiple adjustments to account for the differences in the cost of education in Wyoming. She specifically recommended using the comparable wage index (CWI) to account for growth in professional staff salaries, the comparable wage index for those who have not finished high school (HS-CWI) to account for changes in non-professional staff salaries, and two measures of the producer price index (PPI) to account for energy prices and office supplies, respectively. She recommended some adjustment to the PPI for energy, based on empirical estimates of actual consumption levels of gasoline, commercial electricity, and natural gas.

After reviewing the evidence presented by Taylor (2015), we concur with her recommendation that the state use the four indices described above to account for the differential inflationary pressures of the four components.

There is no universally agreed upon method to appropriately adjust for costs. The consumer price index (CPI) is often used as a simple measure of inflation, but the CPI is intended to be a measure of the growth in prices of a basket of goods consumed by the typical consumer. Even as a measure of inflation on consumer goods it is limited, but it is almost certainly inappropriate to apply the CPI to the types of costs incurred by school districts since school districts do not purchase many of the types of goods purchased by consumers. Indeed, the BLS, which generates the CPI, calculates several measures of inflation because of the great variation in price growth.[14] Given the variation in inflationary influence, below we summarize the recommendations for the three major input types: labor, utilities, and materials.

Labor costs. Non-education labor wages in Wyoming have grown rapidly over the last decade, and an index that fails to account for the growth in non-education wages runs the risk of putting districts at a disadvantage in hiring labor. A CWI, like the one discussed in the previous chapter, allows wages to be adjusted based on the growth in Wyoming. The state uses a separate HS-CWI to account for the wage rates of those who do not have a high school diploma. There is some evidence these two types of wages grow at different rates, but the growth is highly correlated. We recommend the state continue to use the separate indices, but using one combined index likely has little impact on the overall calculation and might have an added advantage of increased precision.

Utilities. The BLS publishes a series of producer price indices (PPI), which are designed to measure the types of inputs purchased by businesses.[15] To account for the change in utility costs, we recommend the state use the composite recommended by Taylor. Specifically, the state should use the PPI for electricity, commercial natural gas, and gasoline to create an index that is the most responsive to the utilities inputs in public schools. Taylor estimates empirical weights for the composite index that can be updated annually based on the weights of expenditures in each of the three categories.

Materials. The materials purchased by schools largely mirror the types of materials purchased by other commercial organizations. We recommend the state continue to use the PPI for office supplies and accessories to account for changes in the relative prices of paper and other supplies.

Conclusion

Taylor has a well-established rationale for recommending the state continue to use the established indices to account for the change in relative growth of prices in each of these areas. We recommend the state make external cost adjustments according to this formula if they wish to maintain equity of funding over time. Although our preferred approach is to recalculate and apply the four indices on an

[14] The BLS publishes over 500 series of input specific price indexes.

[15] For more information on the producer price index, please see the PPI page on the Bureau of Labor Statistics Website: https://www.bls.gov/ppi/home.htm

annual basis, we believe that the cost pressure monitoring method adopted in 2012 is a reasonable alternative for ensuring the funding model remains cost-based. However, we recommend that the state establish specific criteria against which changes in resource prices in the four areas may be compared for determining whether application of the ECA is warranted and the size of the ECA adjustment.

References

Allegretto, S. A., Corcoran, S. P. & Mishel, L. (2004). *How does teacher pay compare? Methodological challenges and answers*. Washington, D.C.: Economic Policy Institute.

Allegretto, S. & Mishel, L. (2016, August 9). T*he teacher pay gap is wider than ever: Teachers' pay continues to fall further behind pay of comparable workers*. Retrieved December 8, 2017, from http://www.epi.org/publication/the-teacher-pay-gap-is-wider-than-ever-teachers-pay-continues-to-fall-further-behind-pay-of-comparable-workers/

Fowler, W. J. & Mittapalli, K. (2006). Where Do Public School Teachers Go when They Leave Teaching? *ERS Spectrum*, *24*(4), 4–12.

Goldhaber, D., Destler, K., & Player, D. (2010). Teacher labor markets and the perils of using hedonics to estimate compensating differentials in the public sector. *Economics of Education Review*, *29*(1), 1–17. https://doi.org/10.1016/j.econedurev.2009.07.010

Gray, L., & Taie, S. (2015). *Public School Teacher Attrition and Mobility in the First Five Years: Results from the First through Fifth Waves of the 2007-08 Beginning Teacher Longitudinal Study. First Look. NCES 2015-337*. National Center for Education Statistics. Retrieved from https://eric.ed.gov/?id=ED556348

Goldhaber, D., Destler, K., & Player, D. (2010). Teacher labor markets and the perils of using hedonics to estimate compensating differentials in the public sector. *Economics of Education Review*, *29*(1), 1–17. https://doi.org/10.1016/j.econedurev.2009.07.010

Startz, D. (2001, November 30). What do teachers do when they leave teaching? Retrieved December 8, 2017, from https://www.brookings.edu/blog/brown-center-chalkboard/2016/05/09/what-do-teachers-do-when-they-leave-teaching/

Appendix A
Table A1
Teacher Salaries and Comparable Non-Teacher Salaries Over Time[16]

Year	Category	USA	WY	CO	ID	MT	NE	SD	UT
2003	Teacher	$42,774	$37,496	$39,306	$37,143	$32,295	$36,043	$32,383	$38,129
	Non-Teacher	$59,772	$45,983	$61,619	$45,198	$39,417	$53,167	$43,788	$51,972
	Ratio	0.72	0.82	0.64	0.82	0.82	0.68	0.74	0.73
2004	Teacher	$44,146	$40,014	$42,018	$40,503	$34,185	$37,705	$34,520	$39,281
	Non-Teacher	$62,968	$53,106	$65,850	$50,103	$41,171	$54,379	$47,283	$56,657
	Ratio	0.70	0.75	0.64	0.81	0.83	0.69	0.73	0.69
2005	Teacher	$45,293	$39,969	$42,188	$39,544	$36,375	$37,869	$32,895	$40,399
	Non-Teacher	$66,335	$53,665	$69,556	$52,532	$51,345	$55,127	$47,896	$58,539
	Ratio	0.68	0.74	0.61	0.75	0.71	0.69	0.69	0.69
2006	Teacher	$46,493	$41,596	$42,504	$39,501	$37,565	$39,501	$35,149	$39,295
	Non-Teacher	$68,580	$53,446	$69,250	$51,808	$50,541	$58,819	$53,733	$58,726
	Ratio	0.68	0.78	0.61	0.76	0.74	0.67	0.65	0.67
2007	Teacher	$48,351	$46,491	$43,949	$40,421	$39,750	$40,350	$36,032	$42,586
	Non-Teacher	$72,611	$61,079	$76,508	$55,702	$52,624	$64,314	$59,675	$65,714
	Ratio	0.67	0.76	0.57	0.73	0.76	0.63	0.60	0.65
2008	Teacher	$49,497	$51,166	$47,197	$40,246	$40,709	$41,630	$36,166	$45,073
	Non-Teacher	$73,941	$58,433	$77,967	$60,314	$53,224	$63,413	$57,252	$66,681
	Ratio	0.67	0.88	0.61	0.67	0.76	0.66	0.63	0.68
2009	Teacher	$51,182	$51,221	$47,195	$44,109	$44,092	$41,429	$36,529	$44,413
	Non-Teacher	$76,240	$56,603	$80,701	$65,425	$53,992	$62,496	$57,659	$65,526
	Ratio	0.67	0.90	0.58	0.67	0.82	0.66	0.63	0.68
2010	Teacher	$51,820	$54,342	$47,611	$43,792	$42,428	$42,982	$37,607	$46,194
	Non-Teacher	$75,836	$60,638	$82,074	$63,658	$53,624	$64,268	$53,848	$65,676
	Ratio	0.68	0.90	0.58	0.69	0.79	0.67	0.70	0.70
2011	Teacher	$52,290	$54,467	$46,245	$42,730	$41,191	$43,675	$37,693	$47,071
	Non-Teacher	$78,136	$67,237	$82,808	$65,321	$53,532	$65,767	$53,279	$68,227
	Ratio	0.67	0.81	0.56	0.65	0.77	0.66	0.71	0.69
2012	Teacher	$52,936	$51,923	$48,116	$43,623	$43,294	$44,292	$38,332	$47,457
	Non-Teacher	$81,050	$66,016	$84,702	$67,031	$60,522	$65,352	$60,897	$68,866
	Ratio	0.65	0.79	0.57	0.65	0.72	0.68	0.63	0.69
2013	Teacher	$52,952	$55,917	$46,216	$43,475	$45,948	$46,014	$36,331	$45,670
	Non-Teacher	$83,586	$74,014	$86,605	$72,495	$58,614	$68,654	$54,747	$69,988

[16] Non-Teacher salaries are the American Community Survey estimates of average salaries of respondents adjusted for the characteristics of teachers in Wyoming. These data were used to generate Figures 1.3 and 1.4.

Year	Category	USA	WY	CO	ID	MT	NE	SD	UT
	Ratio	0.63	0.76	0.53	0.60	0.78	0.67	0.66	0.65
2014	Teacher	$53,739	$54,314	$47,885	$43,541	$43,019	$47,610	$38,352	$46,863
	Non-Teacher	$85,011	$70,660	$87,447	$72,317	$62,345	$72,560	$56,335	$76,564
	Ratio	0.63	0.77	0.55	0.60	0.69	0.66	0.68	0.61
2015	Teacher	$54,625	$57,896	$48,412	$44,440	$45,693	$47,755	$39,177	$48,541
	Non-Teacher	$87,780	$77,042	$91,636	$68,510	$63,053	$75,289	$60,929	$76,046
	Ratio	0.62	0.75	0.53	0.65	0.72	0.63	0.64	0.64
2016	Teacher	$55,392	$58,324	$48,539	$41,805	$44,827	$51,153	$40,687	$47,056
	Non-Teacher	$89,955	$81,059	$89,918	$72,383	$62,579	$74,911	$65,339	$79,181
	Ratio	0.62	0.72	0.54	0.58	0.72	0.68	0.62	0.59

Source: U.S. Census Bureau, American Community Survey and author's calculations.

Appendix A

Table A2

Teacher Salaries and Salaries of Professional/Technical Occupations Over Time[17]

Year	Category	WY	CO	ID	MT	NE	SD	UT
2010	Teacher	$56,727	$49,330	$45,893	$40,413	$48,597	$38,953	$44,853
	Professional	$57,150	$71,438	$56,536	$51,815	$58,890	$52,419	$61,298
	Ratio	0.99	0.69	0.81	0.78	0.83	0.74	0.73
2011	Teacher	$57,287	$49,833	$45,420	$42,437	$46,947	$39,087	$45,510
	Professional	$58,156	$72,961	$56,937	$53,080	$60,488	$54,473	$61,719
	Ratio	0.99	0.68	0.80	0.80	0.78	0.72	0.74
2012	Teacher	$58,737	$48,723	$45,080	$44,777	$47,843	$39,720	$47,410
	Professional	$59,520	$74,067	$58,273	$54,246	$61,143	$55,130	$63,620
	Ratio	0.99	0.66	0.77	0.83	0.78	0.72	0.75
2013	Teacher	$57,973	$49,023	$44,797	$47,483	$48,893	$40,293	$49,643
	Professional	$60,474	$75,250	$59,486	$55,491	$61,195	$56,232	$64,268
	Ratio	0.96	0.65	0.75	0.86	0.80	0.72	0.77
2014	Teacher	$58,420	$49,357	$46,127	$50,057	$49,753	$41,673	$50,923
	Professional	$62,105	$76,197	$61,073	$56,331	$62,225	$57,673	$64,985
	Ratio	0.94	0.65	0.76	0.89	0.80	0.72	0.78
2015	Teacher	$58,507	$50,857	$46,877	$50,710	$50,857	$42,560	$52,413
	Professional	$63,855	$78,084	$61,577	$57,786	$64,457	$59,741	$65,421
	Ratio	0.92	0.65	0.76	0.88	0.79	0.71	0.80
2016	Teacher	$58,740	$51,590	$49,510	$51,600	$55,393	$43,187	$51,960
	Professional	$65,979	$80,256	$62,388	$59,379	$65,847	$61,502	$66,378
	Ratio	0.89	0.64	0.79	0.87	0.84	0.70	0.78

Source: Bureau of Labor Statistics, Occupational Employment Statistics and author's calculations.

[17] Professional salaries are Occupational Employment Statistics estimates of average salaries of respondents in one of the professional categories: management; business; computers and mathematics; architecture; science; community and social services; legal; training; arts, design, entertainment, sports, and media; and healthcare. These data were used to generate Figure 1.5.

Appendix B
Table B1
Comparison of CWI Using All Occupations and Using Only Comparable Occupations[18]

County	CWI	
	All Occupations	Comparable Occupations
Albany	94	99
Big Horn	92	88
Campbell	117	112
Carbon	99	97
Converse	109	112
Crook	96	91
Fremont	94	93
Goshen	91	92
Hot Springs	93	88
Johnson	94	95
Laramie	100	105
Lincoln	101	99
Natrona	103	107
Niobrara	87	97
Park	99	105
Platte	101	86
Sheridan	98	103
Sublette	119	113
Sweetwater	117	113
Teton	112	115
Uinta	98	96
Washakie	95	99
Weston	91	94

Source: Bureau of Labor Statistics, Occupational Employment Statistics and author's calculations.

[18] The right column limits the calculation of the index to occupations that are comparable to teaching: management; business; computers and mathematics; architecture; science; community and social services; legal; training; arts, design, entertainment, sports, and media; and healthcare.

Appendix B

Table B2

OES Occupation Titles of Occupations that are Comparable to Teaching

Management Occupations
Top Executives
Chief Executives
General and Operations Managers
Advertising, Marketing, Promotions, Public Relations, and Sales Managers
Sales Managers
Operations Specialties Managers
Administrative Services Managers
Computer and Information Systems Managers
Financial Managers
Industrial Production Managers
Transportation, Storage, and Distribution Managers
Human Resources Managers
Other Management Occupations
Construction Managers
Education Administrators, Preschool and Childcare Center/Program
Education Administrators, Elementary and Secondary School
Education Administrators, Postsecondary
Education Administrators, All Other
Architectural and Engineering Managers
Food Service Managers
Lodging Managers
Medical and Health Services Managers
Natural Sciences Managers
Property, Real Estate, and Community Association Managers
Social and Community Service Managers
Managers, All Other
Business and Financial Operations Occupations
Business Operations Specialists
Wholesale and Retail Buyers, Except Farm Products
Purchasing Agents, Except Wholesale, Retail, and Farm Products
Claims Adjusters, Examiners, and Investigators

Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation
Cost Estimators
Human Resources Specialists
Labor Relations Specialists
Management Analysts
Meeting, Convention, and Event Planners
Fundraisers
Compensation, Benefits, and Job Analysis Specialists
Training and Development Specialists
Market Research Analysts and Marketing Specialists
Business Operations Specialists, All Other
Financial Specialists
Accountants and Auditors
Appraisers and Assessors of Real Estate
Budget Analysts
Financial Analysts
Personal Financial Advisors
Insurance Underwriters
Financial Examiners
Loan Officers
Tax Preparers
Financial Specialists, All Other
Computer and Mathematical Occupations
Computer Specialists
Computer Systems Analysts
Computer Programmers
Software Developers, Applications
Software Developers, Systems Software
Web Developers
Database Administrators
Network and Computer Systems Administrators
Computer User Support Specialists
Computer Network Support Specialists
Mathematical Science Occupations
Architecture and Engineering Occupations

Architects, Surveyors, and Cartographers
Architects, Except Landscape and Naval
Landscape Architects
Cartographers and Photogrammetrists
Surveyors
Engineers
Chemical Engineers
Civil Engineers
Electrical Engineers
Electronics Engineers, Except Computer
Environmental Engineers
Industrial Engineers
Mechanical Engineers
Mining and Geological Engineers, Including Mining Safety Engineers
Petroleum Engineers
Engineers, All Other
Drafters, Engineering, and Mapping Technicians
Architectural and Civil Drafters
Mechanical Drafters
Civil Engineering Technicians
Electrical and Electronics Engineering Technicians
Electro-Mechanical Technicians
Environmental Engineering Technicians
Engineering Technicians, Except Drafters, All Other
Surveying and Mapping Technicians
Life, Physical, and Social Science Occupations
Life Scientists
Zoologists and Wildlife Biologists
Conservation Scientists
Physical Scientists
Chemists
Environmental Scientists and Specialists, Including Health
Geoscientists, Except Hydrologists and Geographers
Social Scientists and Related Workers
Economists

Clinical, Counseling, and School Psychologists
Urban and Regional Planners
Life, Physical, and Social Science Technicians
Biological Technicians
Chemical Technicians
Geological and Petroleum Technicians
Environmental Science and Protection Technicians, Including Health
Community and Social Services Occupations
Counselors, Social Workers, and Other Community and Social Service Specialists
Substance Abuse and Behavioral Disorder Counselors
Educational, Guidance, School, and Vocational Counselors
Mental Health Counselors
Rehabilitation Counselors
Child, Family, and School Social Workers
Healthcare Social Workers
Mental Health and Substance Abuse Social Workers
Health Educators
Probation Officers and Correctional Treatment Specialists
Social and Human Service Assistants
Community Health Workers
Community and Social Service Specialists, All Other
Legal Occupations
Lawyers, Judges, and Related Workers
Lawyers
Legal Support Workers
Paralegals and Legal Assistants
Title Examiners, Abstractors, and Searchers
Arts, Design, Entertainment, Sports, and Media Occupations
Art and Design Workers
Floral Designers
Graphic Designers
Interior Designers
Merchandise Displayers and Window Trimmers
Entertainers and Performers, Sports and Related Workers
Producers and Directors

Coaches and Scouts
Choreographers
Media and Communication Workers
Reporters and Correspondents
Public Relations Specialists
Editors
Interpreters and Translators
Media and Communication Equipment Workers
Audio and Video Equipment Technicians
Broadcast Technicians
Photographers
Healthcare Practitioners and Technical Occupations
Health Diagnosing and Treating Practitioners
Chiropractors
Dentists, General
Dietitians and Nutritionists
Optometrists
Pharmacists
Family and General Practitioners
Obstetricians and Gynecologists
Surgeons
Physicians and Surgeons, All Other
Physician Assistants
Occupational Therapists
Physical Therapists
Respiratory Therapists
Speech-Language Pathologists
Veterinarians
Registered Nurses
Nurse Practitioners
Health Technologists and Technicians
Medical and Clinical Laboratory Technologists
Medical and Clinical Laboratory Technicians
Dental Hygienists
Diagnostic Medical Sonographers

Radiologic Technologists and Technicians
Emergency Medical Technicians and Paramedics
Pharmacy Technicians
Surgical Technologists
Veterinary Technologists and Technicians
Licensed Practical and Licensed Vocational Nurses
Medical Records and Health Information Technicians
Opticians, Dispensing
Health Technologists and Technicians, All Other
Other Healthcare Practitioners and Technical Occupations
Occupational Health and Safety Specialists
Occupational Health and Safety Technicians
Healthcare Practitioners and Technical Workers, All Other
Education, Training, and Library Occupations
Postsecondary Teachers
Business Teachers, Postsecondary
Health Specialties Teachers, Postsecondary
Vocational Education Teachers, Postsecondary
Postsecondary Teachers, All Other
Preschool Teachers, Except Special Education
Other Teachers and Instructors
Self-Enrichment Education Teachers
Teachers and Instructors, All Other, Except Substitute Teachers
Librarians, Curators, and Archivists
Curators
Museum Technicians and Conservators
Librarians
Library Technicians
Other Education, Training, and Library Occupations
Instructional Coordinators
Teacher Assistants
Education, Training, and Library Workers, All Other

Source OES. These categories were determined based on analysis by Allegretto, Corcoran & Mishel (2004).

Supplemental Report D

Statistical Approach to Adequacy

Prepared for the

Select Committee on School Finance Recalibration

By

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On behalf of

Augenblick, Palaich and Associates

Final, January 12, 2018

Contents

I. Introduction

The cost of education can be defined as the minimum amount of money that a school or school district must spend in order to achieve a given educational outcome, such as students achieving a particular score on state tests. Costs generally differ across schools and districts for reasons that are outside the control of local school boards or state governments, such as the number of children with "special needs." Other factors may include cost-of-living differences that increase the amount of money needed to attract good teachers in some regions, or the diseconomies of scale associated with exceptionally small and large districts. Assuming all other factors are equal, districts with higher costs will need to spend more than districts with lower costs to achieve any particular outcome. Therefore, it is appropriate for school funding formulas to make adjustments for these cost factors.

The study team used a statistical methodology as one alternative approach to recalibration. The report first covers some general background on the estimation of educational costs, and then describes the statistical method. The following section summarizes some of the *a priori* challenges that the Wyoming context poses for using the statistical approach to examine adequacy. The following section then describes the data used to estimate an educational cost function for Wyoming and presents results from that estimation. The *ex post* empirical results are consistent with the previously discussed challenges, suggesting the statistical approach is not likely to provide reliable estimates of school- or district-level, per-pupil costs.

Background

As noted, the cost of education is the minimum amount of money a school or school district must spend to achieve a given educational outcome. Therefore, costs are specifically linked to *outcomes*, and *costs* can differ from *spending* if districts choose to spend more than the minimum necessary to achieve a stated objective. It can be helpful to consider the total cost for a given district as the sum of two components: base costs and marginal costs. Base costs refer to the costs for a low-need district (i.e. a district with relatively low levels of poverty, few ELL students, etc.) to achieve the state standard. Base costs may vary across time or across states because of differences in standards (e.g. if states raise their performance standards, the base cost will increase) or differences in regional price levels (e.g. southern states may have lower base costs than northeastern states). However, in a given year and state, the base cost represents the minimum per-pupil spending necessary within that state for a district with no special needs.

Marginal costs refer to the additional costs associated with specific student or district characteristics, such as poverty, ELL, and special education, above and beyond the base cost in a district with none of these special needs. For example, suppose the marginal cost of a student in poverty is determined to be 10 percent. If the base cost for a student with no special needs is $8,000, then the cost for a poor student is $8,800, or 10 percent more. Many state aid formulas try to account for marginal costs by assigning extra weight, and therefore extra revenue, to students in certain categories. For example, if the marginal cost of a student in poverty is determined to be 10 percent, the formula weight for each poor student may be 0.1 and this generates 10 percent more revenue for that student, relative to the revenue allocated for a non-poor student.

If policymakers wish to design a school finance system that reflects the costs of achieving state performance standards, they will need estimates of both base and marginal costs. Researchers attempting to estimate these costs have used one of four methodological approaches: professional judgment, evidence based, successful schools, or the statistical approach (also called the econometric approach). The rest of this report discusses the use of the statistical approach in Wyoming.

II. Statistical Approach

The statistical, or "econometric," approach utilizes data on per-pupil expenditures, student performance, and various characteristics of students and school districts from all school districts within a state. Regression-based statistical techniques are used to estimate an equation that best fits the available data. Generically, a cost function can be represented by the following equation:

$$S_{it} = h(T_{it}, T_{it-1}, P_{it}, Z_{it}, F_{it}, \varepsilon_{it}, u_{it}),$$

Where per-pupil expenditures in district *i* in year *t* (S_{it}) are specified as a function of public school performance (T_{it}); a vector of input prices (P_{it}); the characteristics of the student body (Z_{it}); other characteristics of the school district, such as its size (F_{it}); a vector of unobserved characteristics of the school district (ε_{it}); and a random error term (u_{it}). Lagged performance (T_{it-1},) is also included to isolate annual performance (this is often referred to as creating a "value-added" model). Once a functional form is chosen for equation (1), it can be estimated with district-level data for a given state.[1] For example, the cost function literature typically assumes equation (1) is log-linear (i.e. continuous variables, such as expenditures and enrollment, are converted to logs) so the empirical model becomes:

$$S_{it} = \alpha + \beta_1 T_{it} + \beta_2 T_{it-1} + \beta_3 P_{it} + \beta_4 Z_{it} + \beta_4 F_{it} + \varepsilon_{it} + u_{it}$$

The model in this case is estimated using ordinary least squares (OLS) regression and the resulting β coefficients indicate the contribution of various district characteristics to the cost of education, holding all other variables constant. Thus, if school performance, T_{it}, is measured with the percent of students achieving at a proficient level on state tests, then a one-unit change in that percent proficient would be associated with a β_1 change in per-pupil expenditures.

In summary, imagine a simple scatterplot with expenditures on the Y-axis and the percent proficient on the X-axis and each school's combination of expenditures and percent proficient is one dot in the graph. OLS finds the equation of the line that best fits through all the dots and β_1 is the slope of that line, holding all other district and school characteristics constant.

The cost function estimates can be used to predict the cost of a given level of performance. The cost prediction involves multiplying the cost function coefficients by the actual values of the student and district characteristics while setting the performance variables equal to the desired level. Consequently, for each district, we can predict the minimum amount of money necessary to achieve various educational performance goals, given the characteristics of the school district and its student body. Base costs are easily determined as the minimum costs predicted using the cost function for a district with low or average values of all included cost factors. Marginal costs are also easily determined because the

[1] In theory, a cost function could be estimated with school-level data. However, in practice, budgets are usually developed and reported at the district level. Specific issues related to school-level cost functions are discussed within the Wyoming context in the next section.

coefficients quantify the additional spending required for higher values of a specific cost factor, holding everything else constant.

It is important to emphasize that the statistical approach attempts to isolate the relationship between spending and outcomes *while holding the other variables constant*. Given that it is well established that it costs more to educate certain types of students in certain types of districts, the simple (unadjusted) correlation between spending and outcomes does not necessarily reveal the *cost* of achieving a particular outcome level. It may be that high-spending districts are also districts with large shares of students in poverty or with large numbers of ELL students, or with high labor costs. So the high spending levels may not be associated with higher achievement. The statistical approach controls for these student characteristics and can be used to determine whether a difference in spending is associated with a difference in outcomes for two districts that have *identical* characteristics (at least for the characteristics included in the model).

Although generally considered more complex than other methods, the statistical approach is the only methodology that directly quantifies the relationship between outcomes and costs for districts with a variety of characteristics. The resulting coefficients therefore provide a straightforward way to estimate costs for a range of different achievement targets and for districts with a range of differing characteristics.

However, cost functions are “black boxes” that do not provide any guidance as to *how* districts should organize their resources: they simply generate an overall cost estimate number. Furthermore, the statistical approach derives cost estimates from observed data under the pre-existing system. The resulting estimates implicitly assume no structural changes in the institutional structure of the system. In other words, the cost estimates assume that districts will continue to operate under the same constraints they have operated under in the past. One should not extrapolate from cost function estimates into contexts that are different from the context in which the original data was generated.

Finally, cost functions are limited by the same problems that can plague any statistical analysis, including errors in estimation and availability of high-quality data. In particular, the cost function model rests on strong assumptions about district behavior. The theory underlying the empirical model assumes that districts organize their resources in order to maximize observable student performance, given a set budget (or conversely, minimize spending, given a set performance). For the cost function estimates to be useful, the included performance measures should be appropriate and comprehensive measures of all the “outputs” that districts care about, and the other included variables should capture all student and district factors that may reasonably affect costs.

III. Challenges of Estimating a Cost Function in Wyoming

Unfortunately, the above-mentioned limitations indicate several challenges for cost function estimation in the Wyoming context.

Allocation of district-level expenditures: The accountability system in Wyoming focuses entirely on school-level outcomes. This rules out using district-level data for a cost analysis because there are no district-level outcomes that district officials would be trying to maximize (i.e. the theory underlying the model assumes that the *producer* is maximizing *output*, which clearly would not be the case at the district level). Estimating a cost function at the school level is theoretically possible but requires expenditure data tracked down to the school level *and* assumes that district or school officials are allocating all of those funds in a way that maximizes the measured school-level student performance. While Wyoming's accounting system does provide a great deal of information on school-level expenditures, there are always some district-level expenditures for centralized services. Since those district-level funds presumably still support student achievement, they should be included in the cost function analysis, but it is not clear how best to allocate those funds down to the school level, nor is it clear that school and district officials are allocating those funds in ways that maximize school-level student performance. In the analysis below, the cost function models were estimated with and without these district-level expenditures.

Exclusion of some schools from the analysis entirely: The theory underlying the cost function model suggests it ought to be estimated for schools or districts with similar cost structures (i.e. where the marginal impact of a given characteristic on outcomes would be similar for all schools or districts in the sample). That means estimating separate models for elementary schools (with static classrooms for each grade) and high schools (with different classrooms for different subjects). It is unclear what to do with the schools that do not fit neatly into either structure (e.g. K-12, K-8, or other mixes). Given that there are too few of them to do a separate analysis, there is simply no way to generate appropriate cost estimates for them at all using the statistical method.

Small sample size: The small number of schools and districts makes it unlikely that any statistical model could be estimated with much precision. Even with school-level models instead of the more common district-level model, there are only 175 elementary schools and 59 high schools with complete data. In any statistical analysis there is always some *noise* and coefficients are reported with metrics that indicate the level of confidence that the estimates are accurate, at least within a certain range. In particular, one commonly used metric is to note whether coefficients are "statistically significantly different from zero, at the 95 percent level," which means that we can be 95 percent confident a given coefficient is *not* actually equal to zero (or conversely, we can be 95 percent confident there *is* some positive or negative relationship between that specific variable and the dependent variable of interest). In general, the smaller the sample, the wider the confidence intervals, which makes it more difficult to determine whether differences between schools or groups of schools are due to actual differences or random chance. A power analysis, a statistical method for evaluating how reliable the results of a regression will be based on the sample size available, indicates that to detect a difference between high schools in an analysis using all 59 high schools, the difference would require an effect size of 0.72 to be statistically significant.[2] This means that the analysis can only identify differences if they are quite large. For example, the analysis would only detect a difference in achievement if they were 7.6 percentage points different. Subsequently, unless the relationships between school expenditures, performance outcomes, and cost factors are particularly clear and strong, the small number of observations makes it more likely the estimates from a Wyoming cost function will not be statistically significant, meaning the estimates of the relationships may be related to random variation in the cost data rather than revealing important relationships. If the coefficients are not statistically significant, then any subsequent cost predictions based on those coefficients will have little meaning.

In summary, OLS fits a line through the dots representing each school's combination of expenditures and performance, and the coefficient β_1 is the slope of that line. The standard error of β_1 is based on the distance between each dot and the fitted line. Therefore, the more tightly all the dots line up, the smaller the standard error and the more confidence we can have that we have identified the "true" equation of the line. With smaller samples, each individual dot contributes more to the standard error. So unless the dots line up particularly well, it can be more difficult to determine the "true" equation.

Multiple output measures: Another challenge for cost function analysis in Wyoming is that the accountability system includes many different measures that schools may be targeting (achievement levels, growth, equity, etc.). Given that the purpose of the model is to generate an estimate of the cost to educate students up to a desired achievement level, the appropriate thing to do would be to include *all* of the relevant measures in the model. Aside from the implications for practical application, the underlying theory of cost functions also suggests that these variables should be included. That is, the theory assumes districts organize resources to maximize certain "outputs." If districts are spending resources to improve outcomes that are not included in the empirical model, that spending would be considered "inefficient" (even if those outcomes are completely legitimate goals) and that would make it more difficult to identify the true relationship between spending and the outcome measures that *are* included. However, from a statistical standpoint, adding additional variables to the model can have a similar effect as reducing the sample size: the more variables included in the model, particularly if those variables are highly correlated with one another, the more statistical noise there is likely to be, and again the coefficients are estimated with less precision. With large samples, this is less of a concern, but in Wyoming, there is likely to be a trade-off between fidelity to the theory and statistical reliability.

[2] This power analysis includes these assumptions: alpha level of 0.05, a two-tailed test, statistical power of 0.80, a proportion of shared variance between covariates of 0.05, and a sample of 59 high schools.

IV. Wyoming Cost Function Data

In order to estimate a cost function for Wyoming schools, data on school and district expenditures were merged with school and district characteristics. The data is from 2016-17 (with lagged performance in 2015-16). As is common in this literature, equation (1) is assumed to be log-linear (i.e., continuous variables, such as expenditures and enrollment, are converted to logs). Separate models were estimated for elementary schools (175 schools with complete data) and high schools (59 schools with complete data).

Two measures of school-level, per-pupil expenditures were used, with and without district expenditures added. Models with *school-only* expenditures included only those expenditures that were specifically targeted to school sites. Models with *all* expenditures added on expenditures that were targeted to the district (i.e. not to any specific school site), on a per-pupil basis.[3] Models were also estimated using *all* expenditures and only *operating* expenditures (excluding funds for capital projects, debt service, internal services, or agency funds).

The student outcome variables are those used in the state accountability system. For elementary schools, schools are expected to hit targets for the percent of students testing at proficient levels on the Proficiency Assessment for Wyoming Students (PAWS) in reading, math, and science, for third through eighth grades. There are also targets for growth (changes in achievement from year to year) and equity (growth in math and reading for low-performing students). For high schools, schools are expected to hit targets for students achieving proficiency on the ACT subject area tests in reading, math, science, and combined English/writing, in 11th grade. There are also targets for growth, equity, graduation rates, and an "additional readiness" index consisting of Hathaway scholarship eligibility, ninth grade credits earned, and test readiness. The cost function models were estimated with multiple measures of performance, as well as just simple test score achievement (percent proficient).[4]

The other variables included in the model follow the literature on cost analyses of this kind and include a measure of teacher wage costs,[5] enrollment and enrollment squared (to account for economies and diseconomies of scale), student poverty (percent of students in the free or reduced-price lunch programs), ELLs, and special education (with a separate measure of high-cost disabilities, such as deaf–blindness). Tables 4.1A and 4.1B show the summary statistics for all of the variables in the analysis. These are reported for elementary and high schools separately, as the cost functions will be estimated separately for these two groups. There is clearly a great deal of variation across schools in their expenditures, performance, and characteristics.

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[3] An alternative way to address the district-level expenditures is to estimate models with district fixed effects. Those estimates are similar to those reported in Tables 2 and 3.

[4] In addition to the models reported in Tables 2 and 3, other models were estimated with different combinations of the outcome variables; those estimates are similar to those reported in Tables 2 and 3.

[5] A comparable wage index provided by the National Center for Education Statistics for every district in the country, described in Taylor and Fowler (2007).

Table 4.1A

Summary Statistics, Wyoming Elementary Schools 2016-17 [n=175]

Variable	Mean	Std Dev	Minimum	Maximum
Per-Pupil School Expenditures, All	$13,628	$6,643	$3,318	$59,068
Per-Pupil School Expenditures, Operating	$13,003	$5,630	$3,318	$59,068
Per-Pupil School + District Expenditures, All	$22,276	$10,747	$13,768	$122,941
Per-Pupil School +District Expenditures, Operating	$19,420	$6,073	$13,521	$64,132
Achievement 2016-17	59.5%	12.7%	13.0%	91.0%
Achievement 2015-16	59.6%	12.8%	7.0%	96.0%
Growth 2016-17	51.6	10.0	28.0	82.5
Growth 2015-16	52.0	10.5	23.0	85.5
Equity 2016-17	53.9	12.8	26.0	94.0
Equity 2015-16	53.4	13.0	18.0	92.0
Teacher Cost Index	1.364	0.061	1.303	1.453
Enrollment	253.45	138.63	6	822
Percent Poverty	42.6%	18.1%	0.0%	100.0%
Percent ELL	4.1%	6.5%	0.0%	36.9%
Percent Special Education	14.5%	4.7%	0.0%	28.0%
Percent High-Cost Disabilities	1.3%	1.1%	0.0%	5.7%

Table 4.1B

Summary Statistics, Wyoming High Schools 2016-17 [n=59]

Variable	Mean	Std Dev	Minimum	Maximum
Per-Pupil School Expenditures, All	$18,216	$8,539	$8,164	$63,663
Per-Pupil School Expenditures, Operating	$15,911	$5,693	$8,164	$37,974
Per-Pupil School + District Expenditures, All	$29,769	$16,924	$16,785	$131,060
Per-Pupil School +District Expenditures, Operating	$23,663	$7,134	$15,284	$44,997
Achievement 2016-17	34.1%	10.5%	5.0%	57.0%
Achievement 2015-16	36.3%	12.2%	4.0%	61.0%
Growth 2016-17	49.5	6.4	32.0	63.5
Growth 2015-16	48.8	6.2	28.0	62.0
Equity 2016-17	50.3	10.5	26.0	76.0
Equity 2015-16	50.8	7.9	35.5	65.0
Graduation Rate 2016-17	84.6%	11.8%	48.5%	100.0%
Graduation Rate 2015-16	83.9%	12.9%	36.4%	100.0%
Teacher Cost Index	1.36	0.06	1.30	1.45
Enrollment	425.49	448.22	15	1790

Variable	Mean	Std Dev	Minimum	Maximum
Percent Poverty	31.8%	17.0%	4.8%	100.0%
Percent ELL	2.0%	3.3%	0.0%	21.5%
Percent Special Education	12.2%	4.3%	6.2%	33.3%
Percent High-Cost Disabilities	1.7%	1.2%	0.0%	6.7%

V. Wyoming Cost Function Model Estimates

Results from school-level cost functions are shown in Tables 5.1 (elementary schools) and 5.2 (high schools). The coefficients reported here can generally be interpreted as the percentage change in the dependent variable (per-pupil expenditures) associated with a one percent change in that independent variable (or one percentage point for variables that are already measured in percentages). For example, the school-only spending model for elementary schools predicts that if we take two schools with identical student characteristics and that start out with the same level of achievement, increasing the percent of students proficient in one of those schools by one percent will require a *decrease* in spending of 0.62 percent.

In almost cases, the coefficients on the student achievement measures are not statistically significant, and in some cases, are not even the expected sign.[6] The negative coefficient on the outcome variables in the elementary school models is obviously counterintuitive (i.e. the coefficients on outcomes are expected to be positive since a negative coefficient suggests that higher performance is correlated with *lower* spending). The fact that those negative coefficients are actually statistically significant in some cases is even more unusual. It is possible that there are other factors, not included in the model, that are affecting the results. For example, if high-spending districts are also extremely inefficient, or are focused on other outcomes, that could distort the relationship between spending and these performance measures (recall that the theory underlying cost functions assumes districts are using resources fully and efficiently to maximize only the included outcome measures). Although the inclusion of percent poverty and other characteristics should account for differences in spending due to differences in student needs, it may also be that the sample is too small to fully capture the relationships for districts with similar characteristics.

Unfortunately, without statistically significant coefficients on the outcome variables, there is no way to generate meaningful estimates of the *overall* cost of an adequate education from these models. However, the coefficients on the cost factors generally have the expected signs and are statistically significant in some cases, although the coefficient magnitudes appear sensitive to the specification of the model. These coefficients could potentially be used to think about the marginal cost of those specific factors. For poverty, the cost function would suggest a weight of 0.17 to 0.23 for poverty in elementary schools. This is somewhat lower than most other cost studies but still consistent. For ELLs, the elementary results suggest a weight of 0.35 to 0.7. There is a notable difference here between the models with school-only spending and school-plus-district spending. If districts are providing ELL services through centralized district programs, those expenditures may contribute to this difference. For the high school models, there seem to be clear economies of scale (costs fall as size increases) but few other clear cost relationships.

[6] The high school models were also estimated with different combinations of the outcome variables, including the readiness index. In no case were the outcome variables statistically significant.

VI. Conclusions

Although the statistical approach has been used in other states to estimate the costs of providing a high-quality K-12 education, this method rests on strong assumptions and on data that meet the statistical requirements. Unfortunately, the data and context in Wyoming do not seem able to overcome these limitations. The estimated cost functions would generate overall cost estimates that are not only statistically unreliable but that are also clearly not realistic (e.g. costs would go down as achievement goals go up). However, the models do provide some potentially useful information about the marginal costs of poverty and ELLs in elementary schools.

Table 5.1

Wyoming Cost Function: Elementary Schools

	School-Only Expenditures		District+School Expenditures		School-Only Expenditures		District+School Expenditures	
	All	Operating	All	Operating	All	Operating	All	Operating
Achievement 2016-17	-0.726*	-0.616*	-0.299	-0.213	-1.921**	-1.697**	-0.382	-0.296
	[0.348]	[0.300]	[0.294]	[0.176]	[0.474]	[0.397]	[0.427]	[0.233]
Achievement 2015-16	0.612+	0.454	-0.178	-0.085	1.488**	1.158**	-0.129	-0.055
	[0.354]	[0.305]	[0.298]	[0.179]	[0.484]	[0.406]	[0.436]	[0.238]
Teacher Cost Index	-0.767*	-0.620*	0.252	0.129	-0.728*	-0.492	0.375	0.325+
	[0.363]	[0.312]	[0.306]	[0.183]	[0.364]	[0.305]	[0.328]	[0.179]
Enrollment (log)	-0.582**	-0.592**	-0.288+	-0.335**	0.385	0.269	-0.126	-0.19
	[0.192]	[0.166]	[0.162]	[0.097]	[0.313]	[0.262]	[0.282]	[0.154]
Enrollment-squared	0.037+	0.040*	0.009	0.014	-0.057+	-0.044	-0.008	-0.002
	[0.021]	[0.018]	[0.018]	[0.011]	[0.032]	[0.027]	[0.029]	[0.016]
Percent Poverty	0.213	0.226+	0.101	0.137+	0.219	0.227+	0.128	0.171*
	[0.139]	[0.119]	[0.117]	[0.070]	[0.148]	[0.124]	[0.134]	[0.073]
Percent ELL	0.812*	0.700*	0.476	0.362*	0.873**	0.709*	0.494	0.348*
	[0.350]	[0.301]	[0.295]	[0.177]	[0.334]	[0.280]	[0.301]	[0.164]
Percent Special Education	0.431	0.085	1.033*	0.619*	-0.761	-1.106*	0.594	0.046
	[0.532]	[0.457]	[0.448]	[0.268]	[0.600]	[0.502]	[0.540]	[0.295]
Percent High-Cost Disabilities	0.276	-0.229	0.647	0.412	2.144	1.562	1.336	1.417
	[2.185]	[1.879]	[1.841]	[1.101]	[2.215]	[1.857]	[1.996]	[1.089]
Growth 2016-17					0.671+	0.427	0.014	-0.17
					[0.373]	[0.312]	[0.336]	[0.183]
Growth 2015-16					-0.094	-0.045	-0.141	0.04
					[0.351]	[0.294]	[0.316]	[0.172]
Equity 2016-17					0.169	0.391*	0.093	0.214+
					[0.229]	[0.192]	[0.206]	[0.112]
Equity 2015-16					0.028	0.089	0.123	0.105
					[0.249]	[0.209]	[0.224]	[0.122]

	School-Only Expenditures		District+School Expenditures		School-Only Expenditures		District+School Expenditures	
Constant	12.367**	12.201**	10.928**	11.040**	9.810**	9.772**	10.418**	10.458**
	[0.684]	[0.588]	[0.577]	[0.345]	[0.913]	[0.765]	[0.822]	[0.448]
Observations	175	175	175	175	162	162	162	162
R-squared	0.44	0.5	0.43	0.68	0.35	0.41	0.35	0.62
Standard errors in brackets								
+ significant at 10%; * significant at 5%; ** significant at 1%								

Table 5.2

Wyoming Cost Function: High Schools

	School-Only Expenditures		District+School Expenditures		School-Only Expenditures		District+School Expenditures	
	All	Operating	All	Operating	All	Operating	All	Operating
Achievement 2016-17	-0.474	0.185	-0.888	0.188	-0.688	0.16	-1.172+	0.133
	[0.664]	[0.430]	[0.562]	[0.213]	[0.785]	[0.507]	[0.667]	[0.219]
Achievement 2015-16	0.13	-0.005	0.084	-0.134	-0.255	-0.097	-0.125	-0.175
	[0.551]	[0.356]	[0.467]	[0.177]	[0.616]	[0.397]	[0.523]	[0.172]
Teacher Cost Index	-0.927	-0.571	0.177	0.217	-0.991	-0.83	0.018	0.01
	[0.792]	[0.512]	[0.671]	[0.254]	[1.009]	[0.651]	[0.857]	[0.282]
Enrollment (log)	-1.286**	-0.777**	-0.772*	-0.407**	-1.281	-0.59	-1.734*	-0.698**
	[0.409]	[0.264]	[0.346]	[0.131]	[0.763]	[0.492]	[0.648]	[0.213]
Enrollment-squared	0.104**	0.051*	0.055+	0.018	0.105	0.036	0.136*	0.043*
	[0.036]	[0.023]	[0.031]	[0.012]	[0.065]	[0.042]	[0.056]	[0.018]
Percent Poverty	-0.093	0.178	0.441	0.386**	0.131	0.296	0.145	0.337*
	[0.393]	[0.254]	[0.333]	[0.126]	[0.563]	[0.363]	[0.478]	[0.157]
Percent ELL	2.5	0.839	0.77	0.323	1.557	1.01	1.432	0.82
	[1.778]	[1.150]	[1.505]	[0.571]	[2.134]	[1.377]	[1.812]	[0.595]
Percent Special Education	-1.592	-0.395	-0.791	0.017	-1.832	-0.392	-0.112	0.429
	[1.751]	[1.132]	[1.483]	[0.562]	[2.250]	[1.451]	[1.911]	[0.628]
Percent High-Cost Disabilities	1.436	1.937	-3.308	1.699	2.716	2.665	-1.535	3.025
	[5.465]	[3.535]	[4.627]	[1.754]	[6.888]	[4.444]	[5.850]	[1.921]
Growth 2016-17					-0.974	0.514	0.281	0.629+
					[1.202]	[0.776]	[1.021]	[0.335]
Growth 2015-16					2.962*	0.728	0.844	0.119
					[1.341]	[0.865]	[1.139]	[0.374]
Equity 2016-17					0.068	0.233	0.182	0.195
					[0.630]	[0.407]	[0.535]	[0.176]
Equity 2015-16					-0.563	-0.538	-0.295	-0.305

	School-Only Expenditures		District+School Expenditures		School-Only Expenditures		District+School Expenditures	
					[0.764]	[0.493]	[0.649]	[0.213]
Graduation rate 2016-17					-0.127	-0.133	0.46	0.044
					[1.011]	[0.652]	[0.859]	[0.282]
Graduation rate 2015-16					0.31	-0.082	-0.44	-0.187
					[1.106]	[0.713]	[0.939]	[0.308]
Constant	15.065**	12.957**	12.785**	11.251**	14.403**	12.437**	15.399**	12.130**
	[1.674]	[1.083]	[1.418]	[0.537]	[2.735]	[1.765]	[2.323]	[0.763]
Observations	59	59	59	59	55	55	55	55
R-squared	0.3	0.61	0.49	0.86	0.29	0.53	0.53	0.89
Standard errors in brackets								
+ significant at 10%; * significant at 5%; ** significant at 1%								

Supplemental Report E

Review of the Special Education Reimbursement Model

Prepared for the

Select Committee on School Finance Recalibration

By

Dr. William Hartman

Education Finance Decisions

On behalf of

Augenblick, Palaich and Associates

Final, January 12, 2018

Contents

I. Overview of Special Education Funding in Wyoming

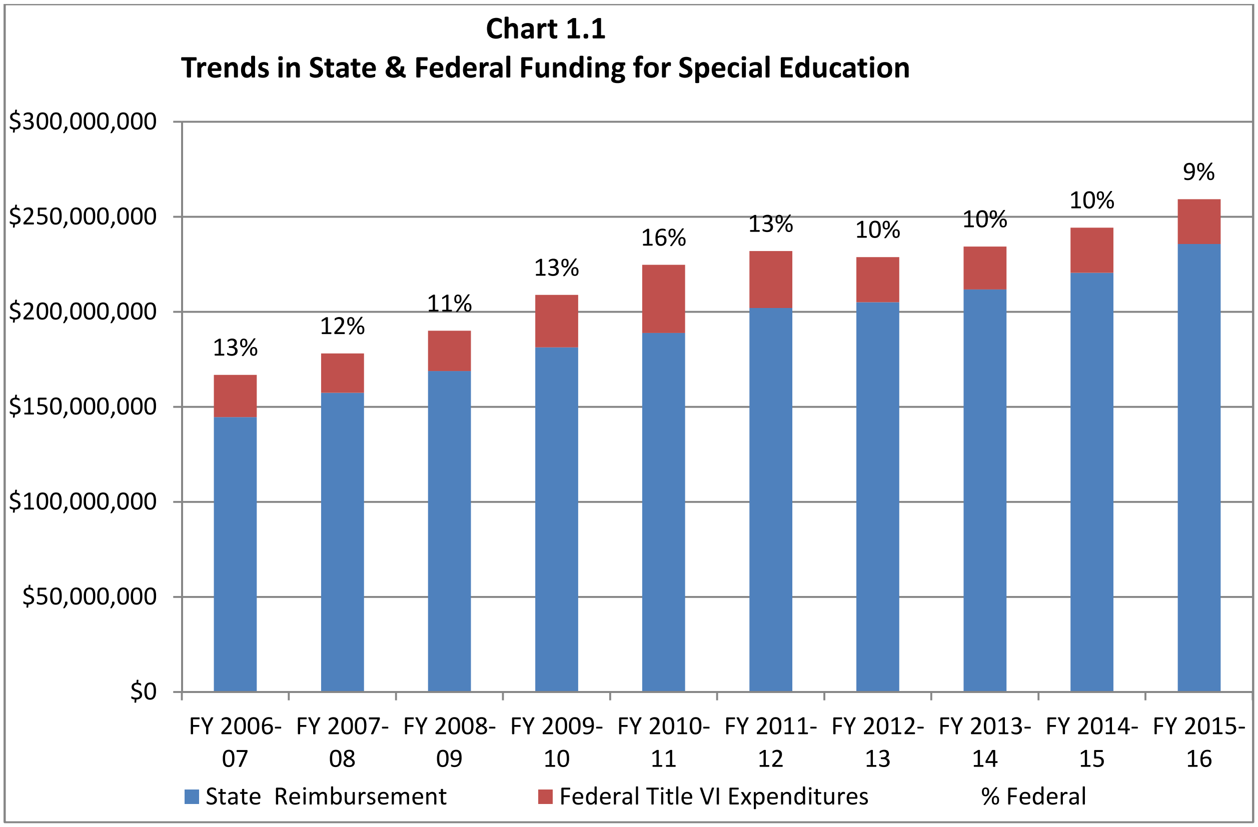
Funding Sources

The two primary funding sources for special education in Wyoming are state reimbursements to school districts for approved expenditures and federal funding from Title VI. Over the past 10 years, the state has provided the vast majority of the funding for special education, while federal funding has played an important but relatively minor role. Adding up the total amounts over the last 10 years, the state has provided $1.917 billion for special education, while the federal contribution has been $251 million or 12 percent. State funding has increased steadily from $144.6 million in 2006-07 to $235.8 million in 2015-16, equivalent to a 5.0 percent annual growth rate. This has resulted in a $91.2 million increase over the 10-year period or a gain of 63 percent. Over this same time, the state has received approximately $20 million to $24 million annually in federal Title VI funds with additional amounts from federal stimulus funding in the middle years. However, because of the gains and losses during the stimulus years, the 10-year net gain for 2015-16 was only $1.3 million more than the beginning amount in 2006-07. Since the stimulus funding ended, federal funding has remained constant while the state funding continued to increase, resulting in a decreasing share of federal support. Of the total new funding for special education since 2006-07, the state has provided practically all of the increase, $91.2 million or 98.6 percent, while the federal funds were only $1.2 million or 1.4 percent of the increase. In 2015-16, the state contributed 91 percent of the total special education funds and the federal funds represent nine percent, down from 13 percent 10 years ago. The amounts and trends illustrating state and federal funding are shown in Table 1.1 and Chart 1.1 below.

Table 1.1

State and Federal Funding for Special Education in Wyoming

Fiscal Year	State Reimbursement	Federal Title VI Expenditures	Total State + Federal	% Federal
FY 2006-07	$144,630,235	$22,239,837	$166,870,072	13%
FY 2007-08	$157,461,168	$20,741,207	$178,202,375	12%
FY 2008-09	$168,900,642	$21,140,140	$190,040,782	11%
FY 2009-10	$181,412,753	$27,491,779	$208,904,532	13%
FY 2010-11	$188,869,347	$35,859,509	$224,728,857	16%
FY 2011-12	$202,037,373	$29,963,631	$232,001,004	13%
FY 2012-13	$205,042,267	$23,846,761	$228,889,027	10%
FY 2013-14	$211,784,155	$22,630,605	$234,414,760	10%
FY 2014-15	$220,658,160	$23,733,924	$244,392,083	10%
FY 2015-16	$235,811,740	$23,514,395	$259,326,135	9%
10 Year Total Funding	$1,916,607,839	$251,161,787	$2,167,769,627	12%
10 Year % Change	63.0%	5.7%	55.4%	-4%
10 Year $ Change	$91,181,505	$1,274,557	$92,456,062	1.4%
% of New Funds	98.6%	1.4%	100.0%	
Annual Growth %	5.0%	0.5%	4.5%	



State Funding

The Wyoming state funding system for special education is relatively simple and straightforward. Basically, it consists of two steps: 1) districts spend monies for special education programs and services for their identified students, and 2) the state reimburses school districts for 100 percent of approved special education expenditures.

There is no specific formula for determining the state's special education reimbursements to districts. Funds are provided to districts based on actual expenditures in the prior year. In establishing the funding amounts, there are no funding factors for the number of students, the type of students, the types of services they receive, the wealth or fiscal capacity of districts, nor their local tax effort.

As a result, the funding provided to districts for special education is equal to the full amount of the approved expenditures by the districts during the previous school year for special education programs and services (in accordance with W.S. 21-13-321 and *WDE Rules and Regulations*, Chapters 7 and 8).

More specifically, the Wyoming process for funding special education is:

- Districts budget and spend monies to provide needed programs and services for special education students in accordance with each student's established individualized educational plans (IEPs).

- District expenditures for special education are recorded in the state's educational accounting system, where they are coded by their function and object classifications (*Wyoming School Budgeting, Accounting and Reporting Manual*).
- The expenditures are reported to the Wyoming Department of Education (WDE) annually. These amounts include detailed expenditures for:
    - personnel: salaries and benefits; and
    - non-personnel: equipment/repair/maintenance, travel, instructional materials, tuition, and contracts.

The *Annual Special Education Expenditure Report* (WDE 401) is used by school districts to report qualifying expenditures and by the WDE to calculate their reimbursements.

WDE personnel review the reported special education expenditures to ensure they are appropriate. Any questions regarding expenditures or student enrollments are resolved, and then expenditures are approved for reimbursement.

Federal Funding

The federal government, through Title VI, provides funding to Wyoming for special education. The amounts provided have been steady between 2006-07 and 2015-16, ranging from $22.2 million initially, rising to $35.9 million in 2010-11 (with the addition of federal stimulus funds), and then dropping back to $23.5 million in 2015-16. Consequently, except for the stimulus years, all of the increases in special education costs have been supported by the state. As result, the federal share of special education funding has dropped from 13 percent to 9 percent over the 10-year period. However, there is a moderate positive correlation (0.22) between state reimbursements per child and federal funds per child. The tendency is that higher spending districts have a modestly higher probability of receiving a higher amount of federal funding.

Boards of Cooperative Education Services (BOCES)[1]

There are a variety of different types of Boards of Cooperative Education Services (BOCES) in the state. Most are single-district BOCES that provide a variety of community and supplemental services for their districts. They were established by Wyoming Statute 21-20-102. Their stated purpose is:

> *…to provide a method whereby school districts and community college districts or any combination may work together and cooperate to provide educational services, including but not limited to postsecondary education, vocational-technical education, adult education and services for children with disabilities, when the services can be more effectively provided through a cooperative effort.*

However, there are three BOCES that are primarily residential institutions that provide programs and services to disabled students in Wyoming on a regional basis: Region V BOCES in Wilson, Northeast Residential BOCES in Gillette, and Northwest Residential BOCES in Thermopolis. These three BOCES are the focus of this section. Their primary function is to provide residential services, but they also offer

[1] Information from a Draft of Final Report, 8-23-2017 prepared by BOCES staff for the Wyoming Legislature.

limited educational day programs in conjunction with surrounding school districts. These residential BOCES provide educational, residential, and related services to special education students who are placed there by their school districts and from court-ordered placements. Approximately 45 of the 48 Wyoming school districts have utilized BOCES services over the past 10 years.

Funding for the residential BOCES depends on the placing agency for their students. For students placed by school districts, the BOCES invoices directly for the cost of educational and residential services provided to their students. The districts then include these costs in their annual reimbursement request and are reimbursed by WDE. However, these billings do not include the operational costs for BOCES (e.g., capital construction, facilities maintenance, educational technology, teacher training, student activities, transportation services, or utilities). Some districts contribute the proceeds from voluntary mill levies to the BOCES to support their operational costs. As Table 1.2 shows, less than half of the districts actually tax for the voluntary mill levy, and the funding burden for these three BOCES is unevenly placed on districts across the state. Additionally, the total amounts received from districts are relatively minor when contrasted to the districts' use of the BOCES. This leaves the BOCES unable to adequately support many non-instructional costs that are required to maintain their educational and residential programs.

Table 1.2
Voluntary Mill Levies from Districts for BOCES

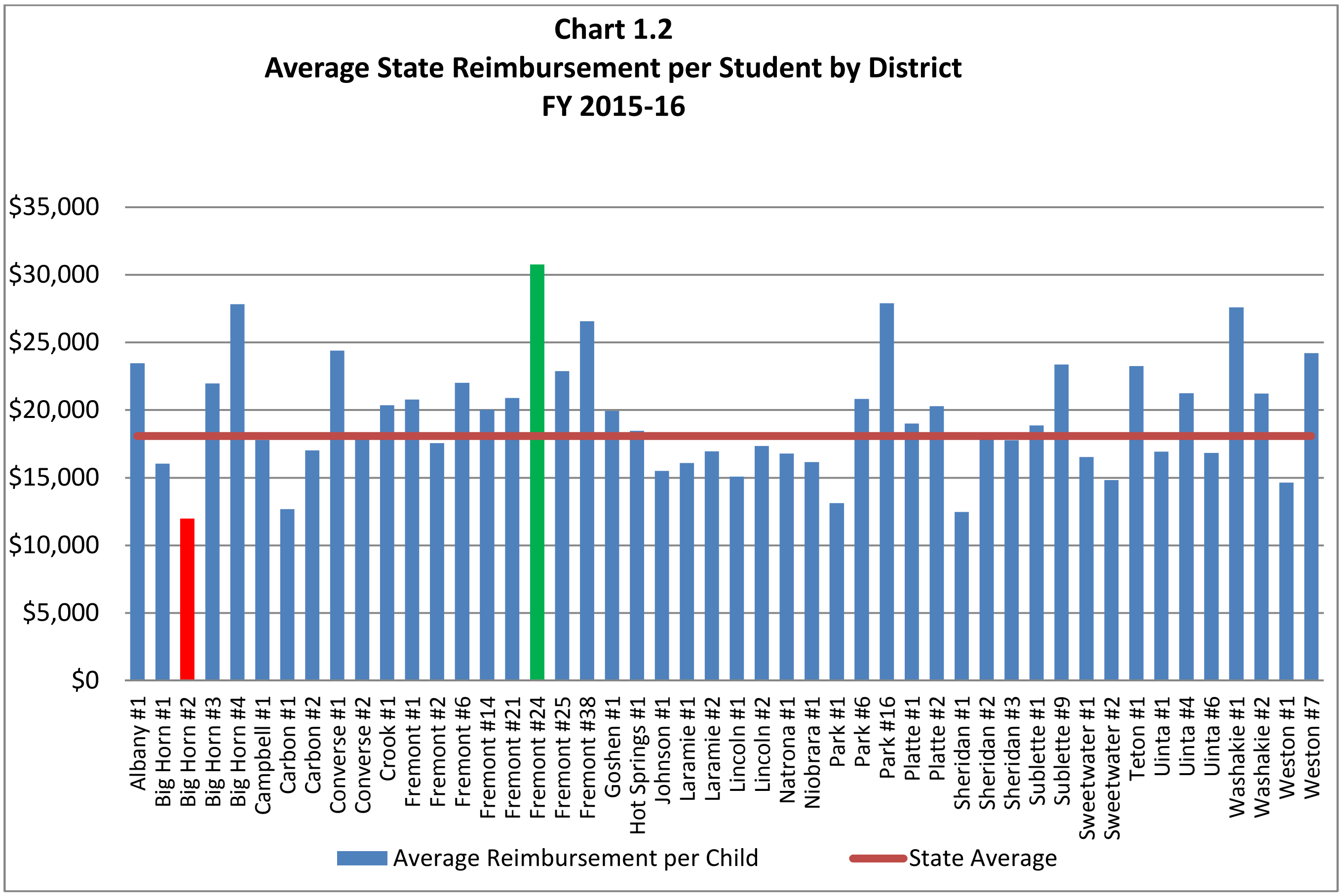
2016	Special Education BOCES			Total
	Region V	Northeast	Northwest	
Total Amount	$905,443	$84,000	$302,251	$1,291,695
Contributing Districts	12	1	9	19
Average Amount	$69,649	$6,462	$16,792	$26,910
Districts Using BOCES Services, 2014-16	22–28	8–10	14–17	29–35

Other state agencies also place students in the BOCES. They are largely court-ordered placements from Wyoming juvenile or district courts. At this point, the Department of Family Services, WDE, and the Wyoming Health Department (but not the student's home district) assume responsibility for the student's education, including paying for residential services, educational services, and related special education health services (which include, but are not limited to occupational therapy, physical therapy, counseling, psychological services, speech and language services, and transportation) provided by the residential BOCES.

Responsibility for reimbursements for services provided is divided among the Department of Family Services, WDE, and Medicaid through the Wyoming Department of Health. The BOCES receive varying amounts from the different agencies, depending on the student's needs, agency rules for eligibility for types of services provided, and funds available from the state agencies' budgets. It is a complicated process, but does not provide full funding due to restrictions on authorized payments for all BOCES' services, and shortfalls in agency budgets to meet reimbursement requests. Table 1.2 provides summary information regarding all three special education BOCES.

Findings

The fiscal data show wide variety in the amounts of special education funding per student across districts. For example, the state average reimbursement per student for 2015-16 was $18,063, while the minimum was $11,969 and the maximum was $30,741, a factor of 2.6 from highest spending to lowest. These differential funding amounts led to districts receiving from $6,094 per student below the state average reimbursement to $12,678 per student above the state average. Charts 1.2 and 1.3 below illustrate the wide disparities.



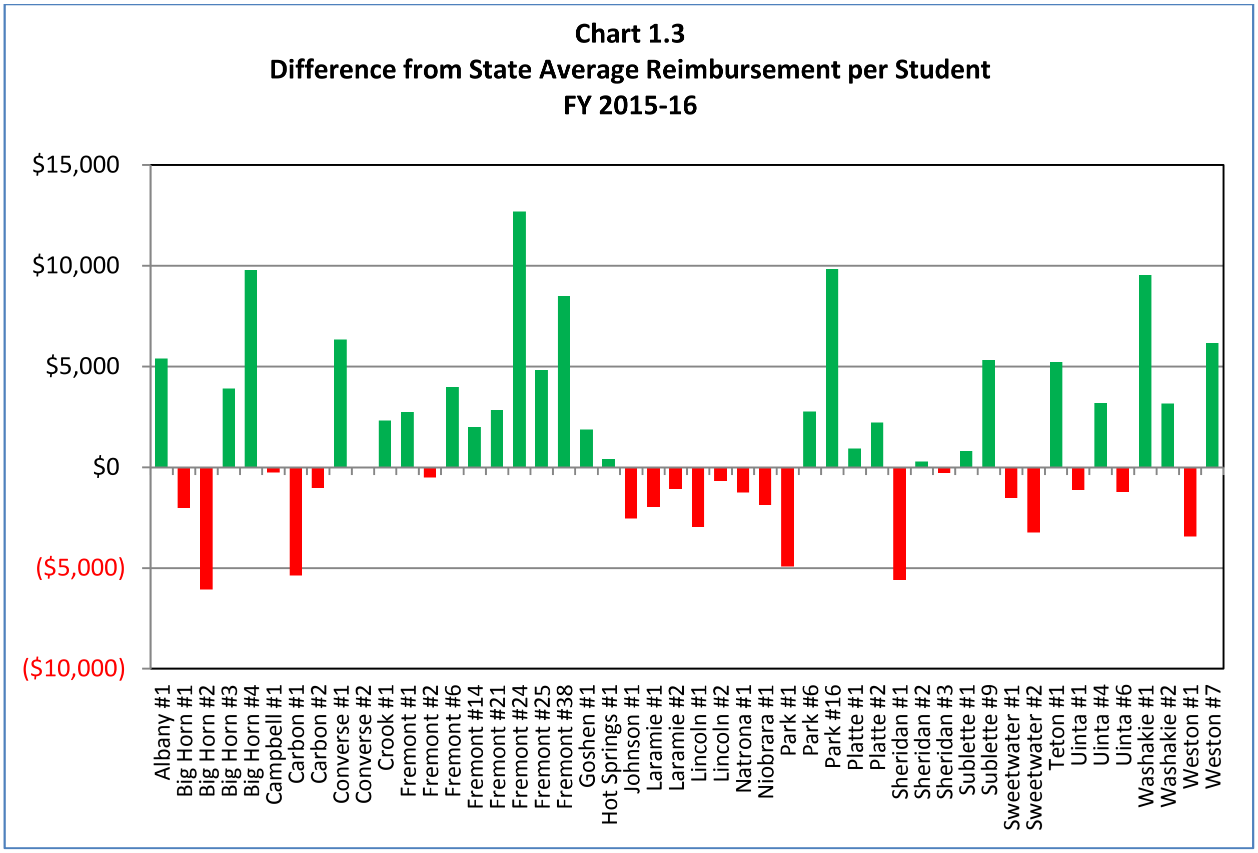


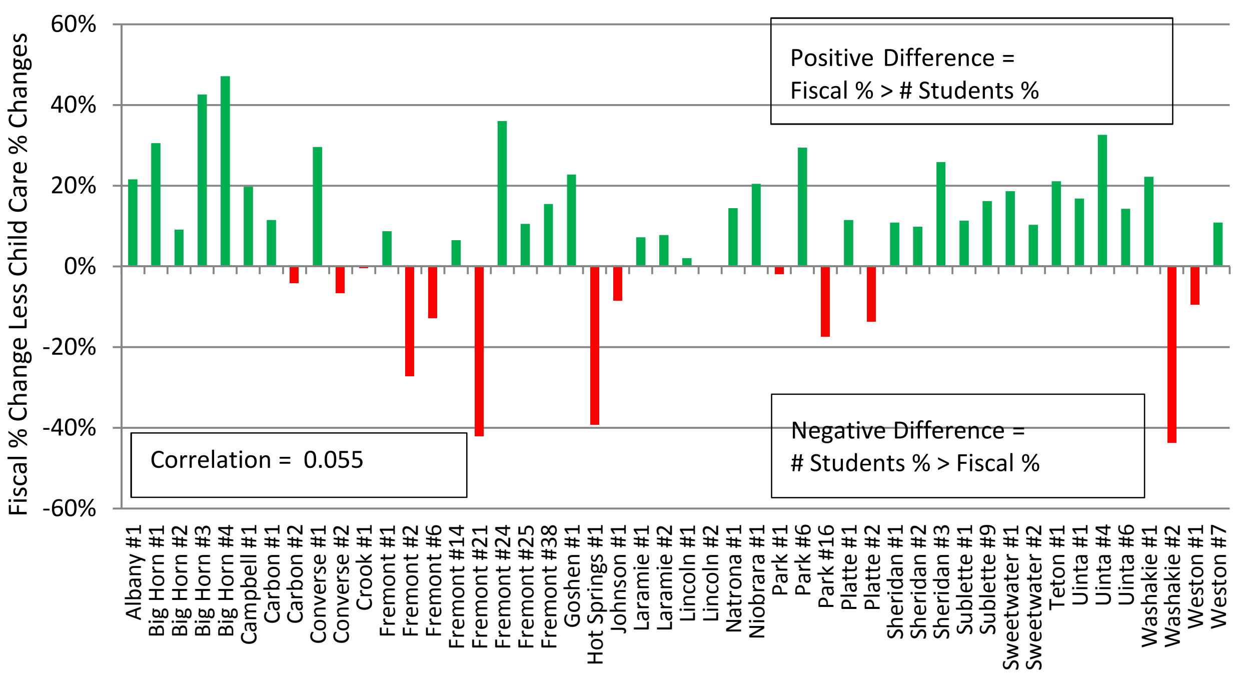
Chart 1.3
Difference from State Average Reimbursement per Student
FY 2015-16
$15,000
$10,000
$5,000
$0
($5,000)
($10,000)
Albany #1
Big Horn #1
Big Horn #2
Big Horn #3
Big Horn #4
Campbell #1
Carbon #1
Carbon #2
Converse #1
Converse #2
Crook #1
Fremont #1
Fremont #2
Fremont #6
Fremont #14
Fremont #21
Fremont #24
Fremont #25
Fremont #38
Goshen #1
Hot Springs #1
Johnson #1
Laramie #1
Laramie #2
Lincoln #1
Lincoln #2
Natrona #1
Niobrara #1
Park #1
Park #6
Park #16
Platte #1
Platte #2
Sheridan #1
Sheridan #2
Sheridan #3
Sublette #1
Sublette #9
Sweetwater #1
Sweetwater #2
Teton #1
Uinta #1
Uinta #4
Uinta #6
Washakie #1
Washakie #2
Weston #1
Weston #7

II. Analysis of Possible Reasons for Differential Reimbursements Across Districts

These substantial differences in expenditures and reimbursements for special education led to a series of analyses to examine the funding differences across districts and possible reasons for the variations.

The first question was whether the 2015-16 school year, the year utilized in the initial analysis, was unusual in its fiscal results. As shown in Chart 2.1, a review of the latest four years of data (2012-13 through 2015-16) found similar wide differences in reimbursements per pupil across districts for all years, indicating this is not a single year anomaly. A further analysis of the three-year changes for both annual reimbursement amounts and numbers of special education students indicates there is little similarity among districts in the levels of change they experienced. While most districts received greater reimbursements during this time, there were eight districts that had their reimbursement amounts decline, indicating lower spending levels. For student number counts, the changes were more varied. Eighteen districts had a decline in their special education population, while 30 districts gained students. In comparing district changes between these two variables, there was almost no correlation between the three-year percent changes in reimbursements per student and the number of students. It appears that the wide differences have been an ongoing condition, not only in a single year.

Chart 2.1
Difference Between Three-Year % Changes:
Average Reimbursement & Number of Special Education Students
FY 2012-13 to FY 2015-16



The next step was an investigation of the possibility that expenditure and funding differences for special education were related to differences in the number, types, or characteristics of the special education population among districts. Several measures of the special education population that logically could have an impact on the costs and funding of special education were examined. These included: the percentage of special education students with higher cost disabilities (i.e. all special education students except those with speech/language disability and learning disability); the percentage of special education students in the total student population (also known as the incidence rate); the total number of special education students in the district; and the total K-12 student population in the district. The analysis included both the unadjusted special education expenditures and RCA-adjusted special education expenditures.

Overall, these calculations showed only relatively weak correlations between average reimbursement per student and any of the population measures. There was little difference in the results between the unadjusted and RCA-adjusted expenditures. Note that the expenditures and population and budget measures were from 2015-16, while the RCA adjustment was for 2017-18. The results of the analyses are summarized in Table 2.1.

Table 2.1
Correlation of Average Reimbursement per Student and Population Measures

% of Students with Higher Cost Disabilities	**0.256**	**0.290**
% of Special Education Students in Total Student Population	(0.239)	(0.284)
Total Number of Special Education Students in the District	(0.230)	(0.169)
Total K-12 Student Population in the District	(0.213)	(0.144)
Percent of Special Education Students and Total K-12 Enrollment	(0.135)	(0.135)
Personnel Costs per Student	0.775	0.768
Student/Staff Ratio 2015-16	(0.456)	(0.488)

- Among the population measures, the strongest link with the average state reimbursement per student was by the districts with a greater proportion with students with higher cost disabilities. However, it had only a modest association (0.256 or 0.290 RCA-adjusted) with state funding per student. While reasonable in concept, the strength of the relationship was not sufficient to adequately explain the expenditure patterns.
- Another possibility was that the incidence rate of special education students in districts would result in higher reimbursements per student. However, incidence rate had a modest negative correlation (–0.239 or –0.284 RCA-adjusted) with the average reimbursement per student. In

other words, the higher the incidence rate in a district, the lower its average reimbursement per student. One potential explanation would be that greater proportions of lower cost students, such as speech/language disability and learning disability, which are also the largest groups of special education students, would lower the average reimbursement amounts. However, further examination found there was only a small correlation (0.132) between percentage of lower cost disability students in a district and its total incidence rate.

- Likewise, the total district special education population had a modest, negative relationship (–0.230 or –0.169 RCA-adjusted) with the average reimbursement per student. The results indicated that the more special education students there were in the district, the lower the average reimbursement per student. However, again the small correlation between proportion of lower cost special students in the district and incidence rate showed that a generalized overweighting of lower cost special education students that lowered the average reimbursement per student was not likely.
- The total enrollment of the district also had a low negative correlation (-0.213 or –0.144 RCA-adjusted) with the average reimbursement per student. This indicated that districts with larger total enrollments tended to receive lower special education average reimbursements. A possibility, which was not borne out by the analysis, was that larger districts with larger special education populations would provide more special education programs and services that were not available in smaller districts, and that these more extensive resources would attract families to move to the district to obtain access to them for their children.

A final population relationship analysis assessed the correlation between the percentage of special education students in the district and the total K-12 enrollment in the district:

- A very small and negative relationship was found (-0.135), denoting that the size of district has little impact on percentage of special education students enrolled in the district. Larger districts do not attract more special education students even with the possibility of more available services. This finding is consistent with the previous low negative correlation above involving total district population and average reimbursement per student.

Several other analyses were conducted to examine the relationship between the average reimbursement per student and the two budget factors that are the most important in determining district expenditures: personnel costs and student/staff ratios. The first, average personnel cost (salary and benefits) per special education student yielded a high correlation at 0.774 (or 0.768 RCA-adjusted), indicating a strong impact of salary and benefit levels on reimbursement levels, which would be expected: those districts with the highest cost factors tended to receive higher reimbursements. The other significant budget factor is the student/staff ratio, which indicates the intensity of personnel use. This staffing factor had a correlation of -0.456 (or –0.488 RCA-adjusted) with the average reimbursement per student. Again, this is not a surprising finding since districts with lower student/staffing ratios have higher levels of staff and personnel costs, which make up the majority of educational expenditures. Those districts that utilize more personnel have higher expenditures, which are basis for the average reimbursement per student.

The logical relationships between average reimbursement per student and a variety of population variables do not show likely or sufficient connections to help explain the wide differences in funding received by school districts. However, budgeting and staffing practices provide stronger relationships with expenditures and, hence, with reimbursements. At this point, the most likely causes may be different district practices in programs and services they provide for their special education students. These could include: identification of students (both total numbers and types of exceptionalities); instructional practices (class size and caseload, use of paraprofessionals and other support personnel, more expensive programming, specialized equipment); more effective advocacy by local groups to gain additional resources; or other factors.

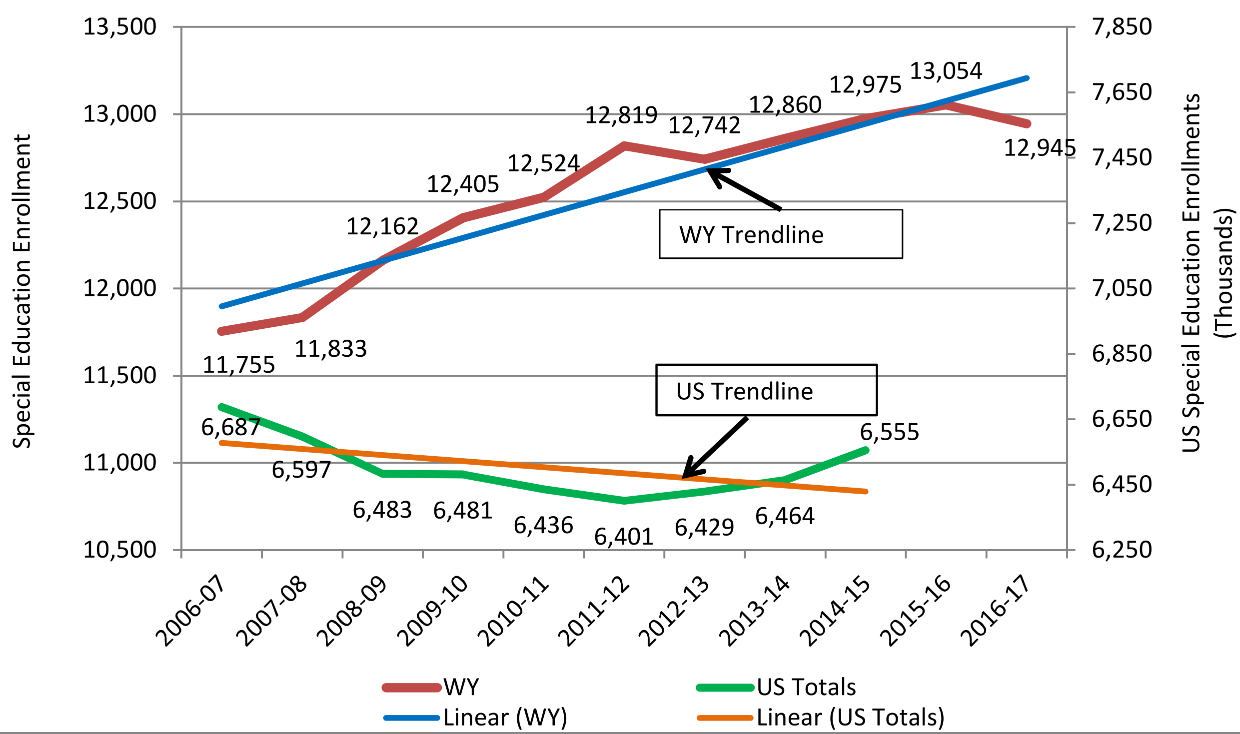
III. State Trends in Special Education

To provide a more focused context for special education funding in Wyoming over the past 10 years (2007-10 through 2016-17), a review of key educational trends in special education in the state was undertaken. The specific areas were enrollments, staffing, and student/staffing ratios

Special Education Enrollments

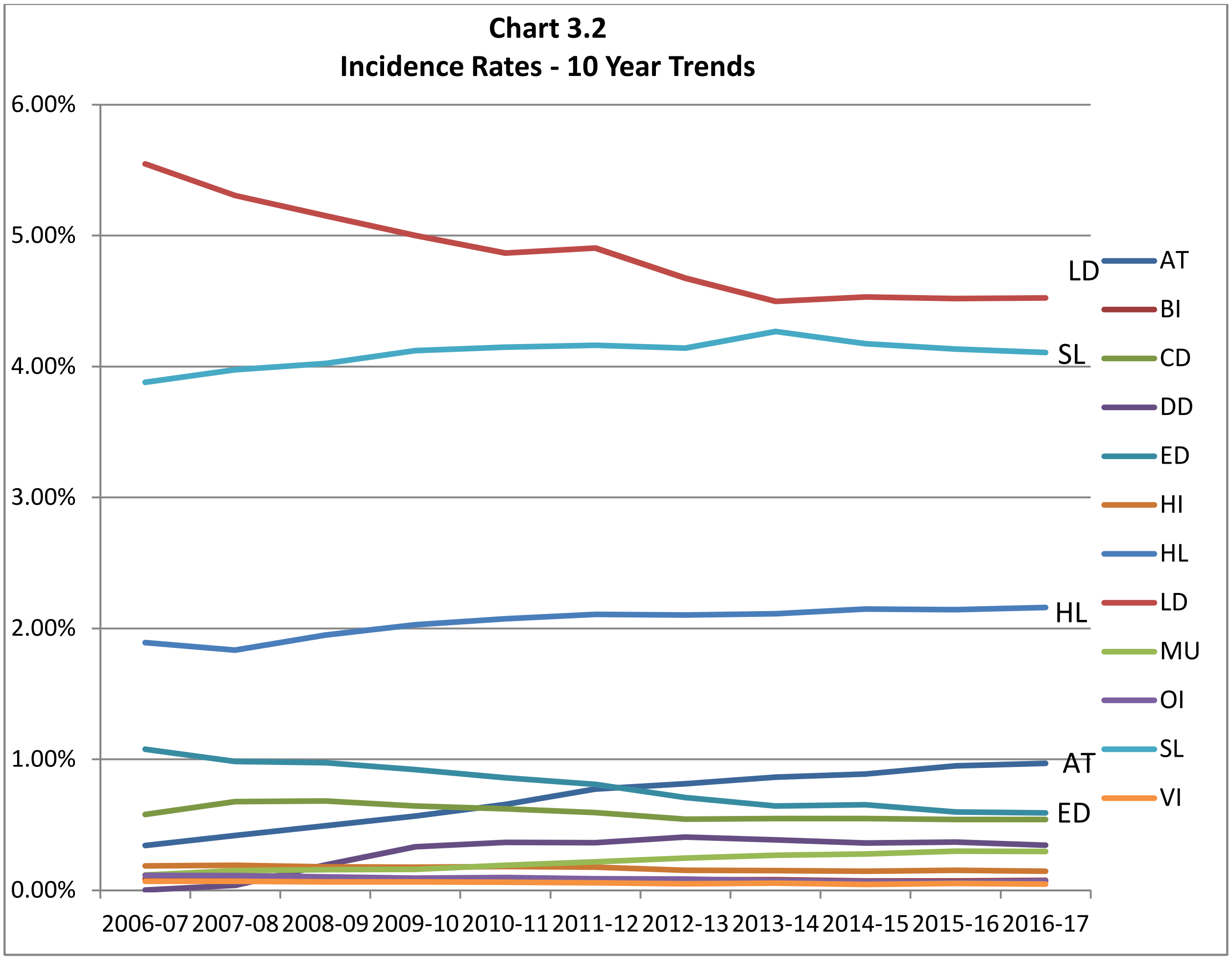
Student enrollments in special education have grown slowly from 2006-07 to 2016-17, gaining about 1,200 students and averaging a modest one percent annual growth rate during this 10-year period. By comparison, the US total disability enrollments declined about two percent over an eight-year period during the same time period (an annual decrease of about 0.25 percent), although recent years have shown annual increases of 0.4 percent to 1.4 percent. The 10-year annual enrollment trends for both Wyoming and the US are illustrated in Chart 3.1.

Chart 3.1
Special Education Enrollments

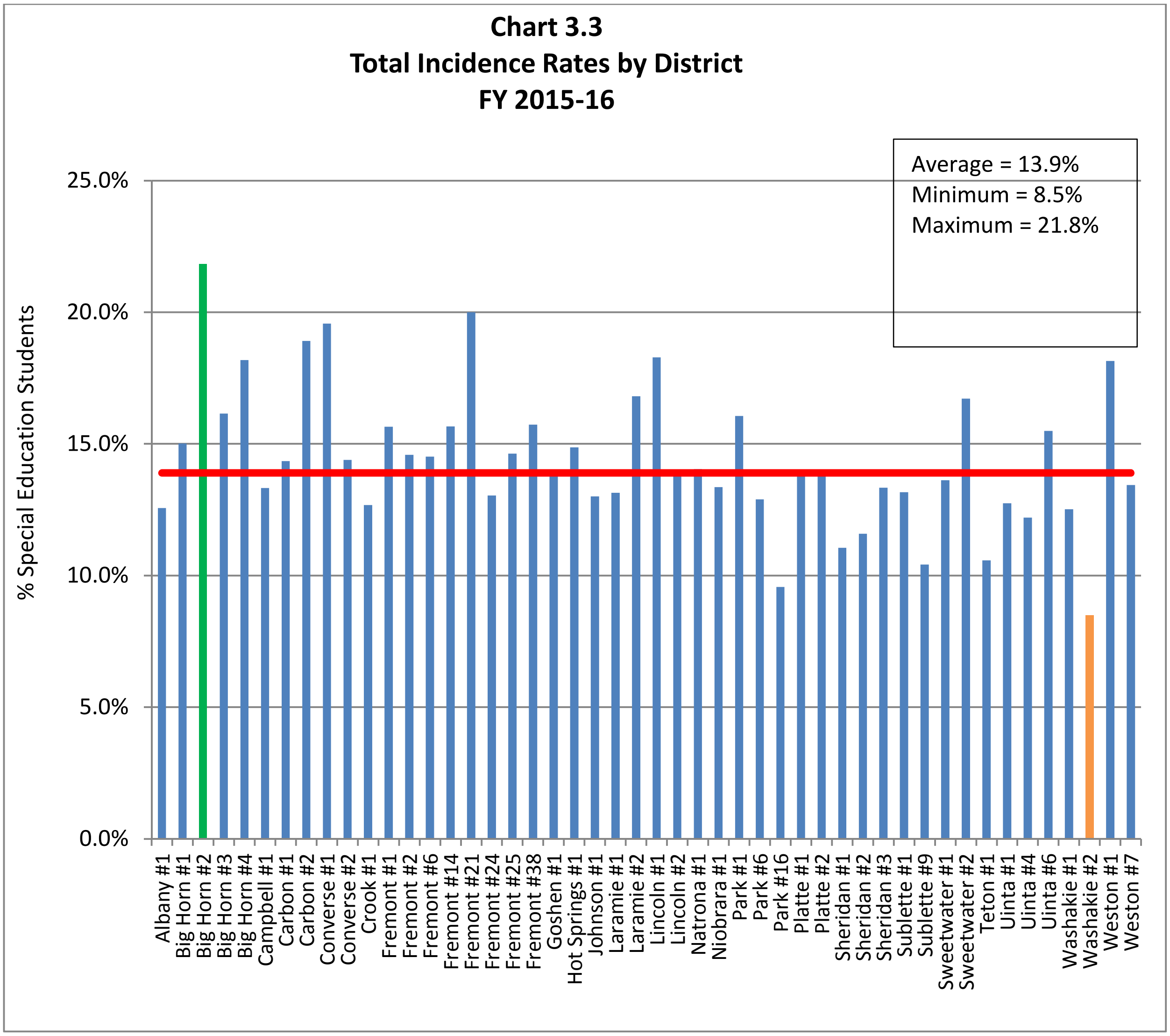


Incidence Rates (Percentage of Special Education Students in a District)

Incidence rates represent the percentage of special education students of a district's total K-12 enrollment. Over time, there has been very little change in the overall statewide incidence rate. It has ranged from a low of 13.8 percent to a high of 14.3 percent from 2006-07 to 2016-17, with an average of 14.0 percent during this time period. However, within the total rate, there have been some changes in individual disability rates, as shown in Chart 3.2. Reductions in the percentage of students with learning disabilities (LD), the most prevalent condition, has declined almost 1.0 percent and emotional disabilities (ED) decreased by almost 0.5 percent. Conversely, greatest gains occurred in students with autism (AT), speech/language disability (SL), other health impaired (HL), and developmental delays (DD).



Across the state, there is substantially more variation among districts in their incidence rates. For 2015-16, the average was 13.9 percent, while the range was from 8.5 percent at the low end to 21.8 percent at the top. The differences by district of the special education incidence rates are shown in Chart 3.3.



To put the incidence rates in Wyoming in perspective, they are compared with the rates in the US by disability in Table 3.1. In general, they are quite similar and the totals are approximately the same. The only noticeable differences are with speech and language disability and other health impaired (in which Wyoming has higher incidence rates) and with cognitive disability and developmental delay (in which Wyoming's incidence rates are lower). Overall, Wyoming has almost a one percent higher total incidence rate than the US average.

Table 3.1
Incidence Rates by Disability

Disability	2015-16	2014-15	Difference
	Wyoming	US	
Autism	1.0%	1.1%	–0.1%
Traumatic Brain Injury	0.1%	0.1%	0
Cognitive Disability	0.5%	0.8%	–0.3%
Developmental Delay	0.4%	0.8%	–0.4%
Emotional Disability	0.6%	0.7%	–0.1%
Hearing Impairment	0.2%	0.2%	0
Other Health Impaired	2.1%	1.7%	0.4%
Learning Disability	4.5%	4.5%	0
Multiple Disabilities	0.3%	0.3%	0
Orthopedic Disability	0.1%	0.1%	0
Speech/Language Disability	4.1%	2.6%	1.50%
Visual Impairment	0.1%	0.1%	0
Total	**13.9%**	**13.0%**	**0.9%**

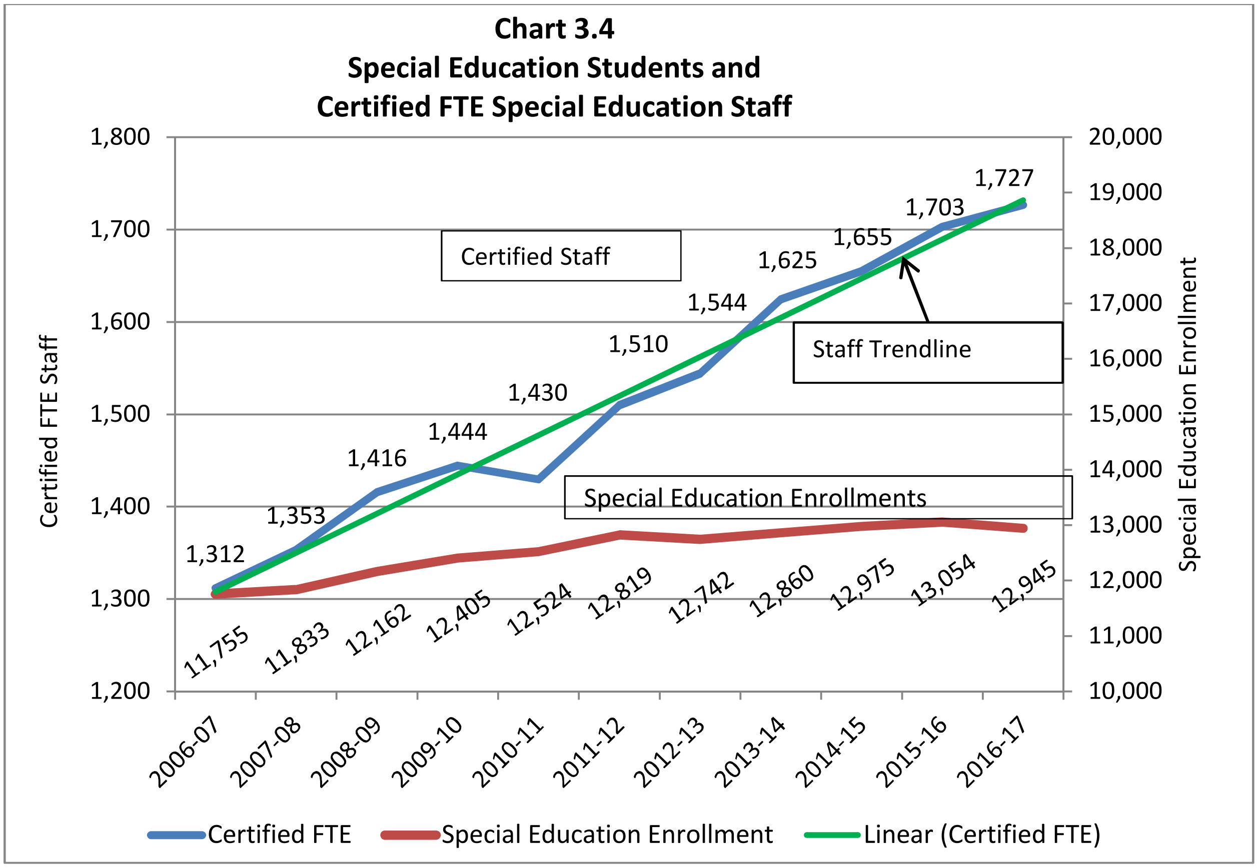
Certified Special Education Staff

Certified staff serving special education students involves a variety of types of personnel whose positions require licensing by the state. They include: teachers, audiologists, case managers, counselors, interpreters, occupational and physical therapists, supervisors, psychologists, school nurses, speech pathologists, and social workers. However, they are not necessarily all present in all districts.

Over the past ten years the growth in certified full-time equivalent (FTE) staff has shown two different growth patterns: fast and faster, as illustrated in Chart 3.4 below. In the four earliest years between 2006-07 and 2010-11, total certified staff increased by 118 FTE or 9 percent, about 30 net new positions per year. During this time, 28 districts gained staff and 20 districts reduced staff.

However, during the next six-year period, 2011-12 through 2016-17, there was a much more rapid increase in special education certified staff. Over this latest and longer time period, an additional 297 FTE positions were added, representing a 21 percent total increase in staff, or approximately 50 new staff per year. Compared to the prior period, 35 districts added positions, while 13 districts lost positions. However, the positive and negative changes were not necessarily in the same districts in each period, with a correlation between districts that gained and lost for the two periods of 0.44. Most of the changes were relatively small, generally clustered within plus or minus five or fewer staff per district for each time period.

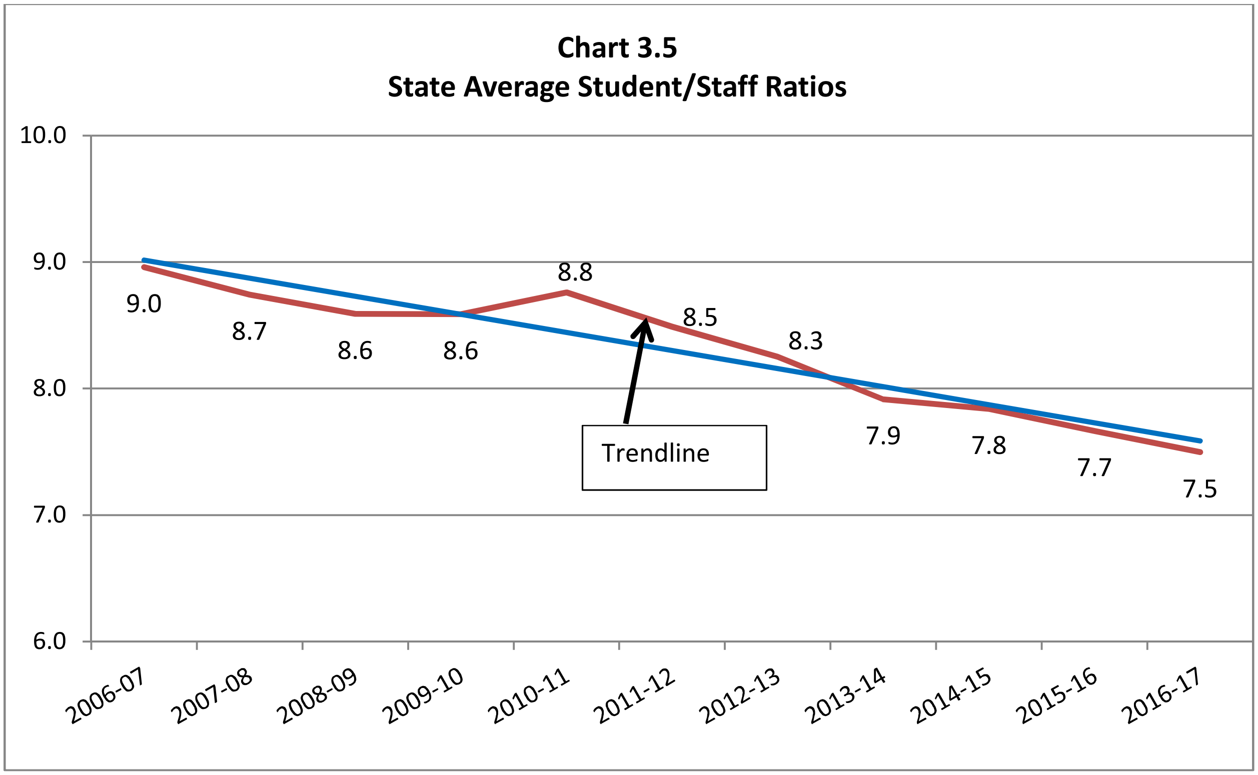
Chart 3.4 clearly illustrates the differences in enrollment and staffing trends. Throughout the 10-year period, special enrollments grew modestly each year. However, staffing increased in the first four years, but rose at a faster rate than enrollment. But, total statewide staffing grew much more rapidly in the next six years, although this trend was not consistent among districts, with some districts losing staff over this time. Overall, the increased staffing was generally not in response to increasing enrollments.



Student/Staff Ratios

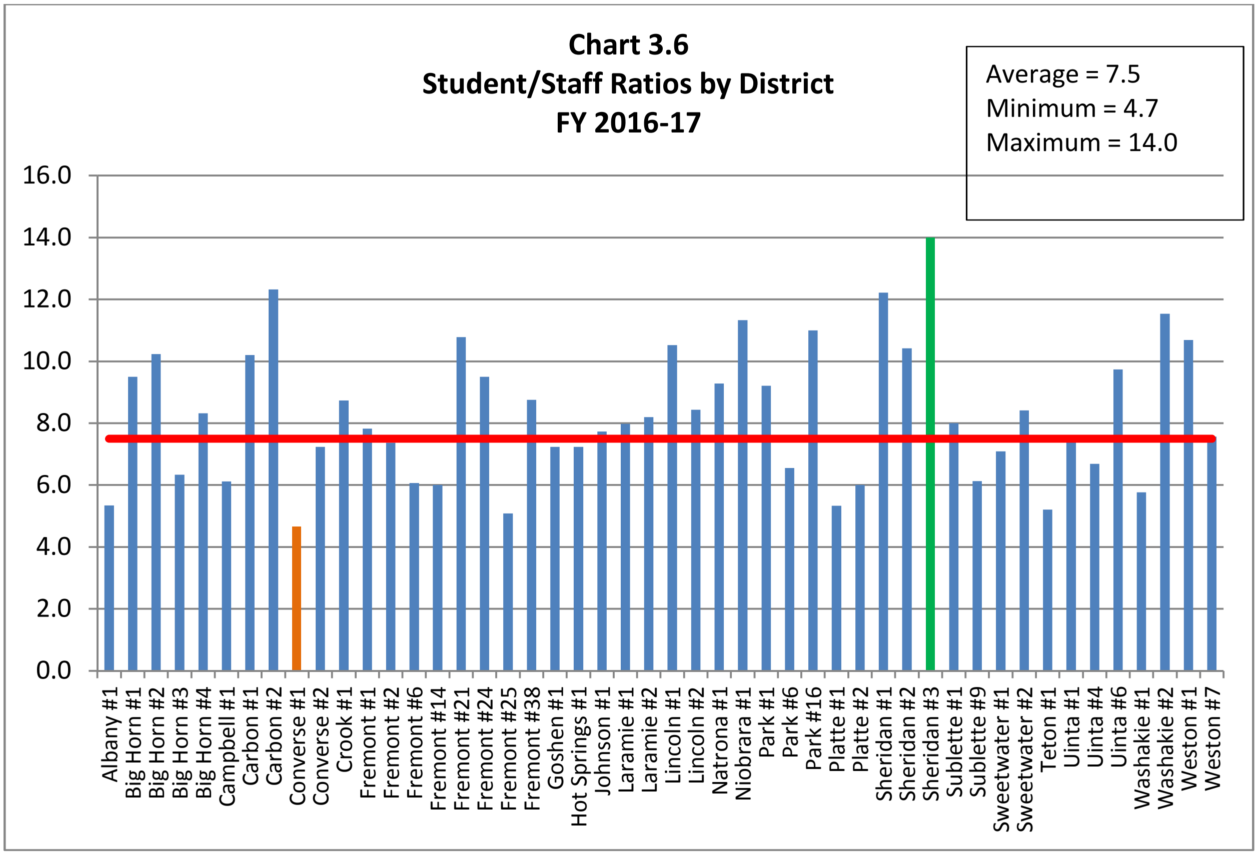
Student/staff ratios measure the intensity of the personnel resources used. Lower ratios mean each staff member serves fewer students, resulting in a greater personnel cost per student, but presumably with a higher level of service. Higher ratios indicate the opposite, more students being served by each staff member and a possible lower level of service for students.

As shown in Chart 3.5, the state experienced very different staffing patterns in the two prior time periods due to varying changes in the numbers of both special education students and special education staff. Throughout the 10-year study period, special education students increased at about one percent per year. However, certified staff grew at consistently higher rates than students, with the increases being more substantial in the later six years. The changes in the student/staff ratios reflected these variations in staff and student numbers. There was a general downward trend in the student/staff ratios dropping from 9.0 at the beginning to 7.5 by the end of 10 years. This steadily declining pattern led to a reduction over the 10 years of about 1.5 students per each staff member's caseload over that period.



For the latest year, 2016-17, the student/staff ratios used by districts varied considerably across the state, averaging 7.5, but with a minimum of 4.7 to a maximum of 14.0. The variation by district is shown in Chart 3.6. However, the ratios can be distorted in districts with low numbers of students that need to maintain a minimum level of instructional staff. This combination results in unusually high student/staff ratios. In correlation analysis of the relationship between the student/staff ratios among districts and the total K-12 enrollment of districts, results indicated little association existed, with a coefficient of 0.11 in 2016-17. So, size of district was not a factor in student/staff ratio decisions among districts.

Nevertheless, these differences have a substantial impact on the availability of instructional and support resources to students. For example, in a district with 270 special education students (state average size) a student/staff ratio of five would have 54 FTE staff to serve the students, while a ratio of 10 would provide only 27 to serve the same number of students. The personnel expenditures would reflect these differences, with the lower ratio district having substantially higher total expenditures than the higher ratio district.



Student Outcomes

Determining the effect of Wyoming's investment in special education programs on student outcomes presents a challenge because using test scores as the sole measure may not tell the entire story because students' individualized education plans (IEP) may include goals that are not directly related to academic performance, such as behavioral or life skills goals. Also, students with more severe disabilities may be exempted from taking state or other common assessments. But, because data on how well students meet the goals of their IEPs are not collected at the state or national levels, standardized assessment results may be the best proxy available for the performance of students with disabilities. The study team felt a comparison across states would provide the most useful information for state policymakers on how well the state is doing educating students with disabilities.

The most comparable data across states is the National Assessment of Educational Progress (NAEP) administered by the National Center for Education Statistics of the U.S. Department of Education. NAEP assessments are administered in a variety of subjects to a sample of students in most, if not all states. The most frequently administered tests are in fourth and eighth grade reading and math assessments, which are typically given every other year. The results of these assessments are available by state and disaggregated by student groups. The data used for this analysis includes Wyoming and its six bordering states, plus North Dakota and the national average. The data presented in Tables 3.2 through 3.5 include NAEP scale scores in reading and math for students with disabilities (SD) enrolled in public schools, and the difference, or achievement gap, in scale scores between SDs and “not students with disabilities” (NSD) for 2009, 2011, 2013, and 2015.

These tables show that for both scale scores and the achievement gap, Wyoming does better than the nation in fourth and eighth grade reading and math, in some cases substantially better, except for the gaps for eighth grade reading in 2011 and 2015. In 2011, Wyoming’s achievement gap is larger than the national average (41 points in Wyoming compared to 39 points nationally), and in 2015, the gap is the same (43 points for both).

Compared to its surrounding states, Wyoming generally ranks among the top three. It ranks first among the comparison states for both scale score and achievement gap in fourth grade reading in 2015, fourth grade math in 2013, and eighth grade reading in 2013. It ranks first in scale scores but not achievement gap in fourth grade math in 2015, and in achievement gap but not scale score in eighth grade math in 2013. The state ranks fourth in both scale scores and achievement gaps in fourth grade reading in 2009 and eighth grade reading in 2015.

Based on these NAEP results, Wyoming consistently performs better than the nation as a whole in educating its students with disabilities, and ranks as a top performer along with North and South Dakota within its region.

Table 3.2
Fourth Grade Reading

	2009		2011		2013		2015	
	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank
State	**Fourth Grade Reading**							
Wyoming	193	4	194	2	191	2	194	1
Colorado	188	6	176	7	173	6	174	7
Idaho	174	8	176	7	162	7	174	7
Montana	191	5	190	4	186	3	187	4
Nebraska	194	3	191	3	181	4	190	2
North Dakota	206	1	196	1	193	1	189	3
South Dakota	200	2	187	5	181	4	182	6
Utah	186	7	184	6	180	5	183	5
U.S.	187	-	185	-	181	-	184	-
	Scale Score Diff SD-NSD	**Rank**	**Scale Score Diff SD-NSD**	**Rank**	**Scale Score Diff SD-NSD**	**Rank**	**Scale Score Diff SD-NSD**	**Rank**
Wyoming	-35	4	-35	2	-41	2	-40	1
Colorado	-41	7	-52	6	-58	5	-55	7

	2009		2011		2013		2015	
	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank
Idaho	-50	8	-49	5	-63	6	-52	6
Montana	-37	6	-38	3	-41	2	-42	2
Nebraska	-34	3	-38	3	-48	4	-43	3
North Dakota	-22	1	-33	1	-34	1	-40	1
South Dakota	-24	2	-38	3	-43	3	-44	4
Utah	-36	5	-40	4	-48	4	-49	5
U.S.	-36	-	-39	-	-45	-	-42	-

Table 3.3
Fourth Grade Math

	2009		2011		2013		2015	
	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank
State	**Fourth Grade Math**							
Wyoming	227	2	226	2	228	1	224	1
Colorado	217	7	215	8	215	7	206	7
Idaho	217	7	216	7	213	8	209	6
Montana	223	4	219	6	216	6	218	4
Nebraska	221	5	220	5	221	3	222	2
North Dakota	230	1	227	1	224	2	220	3
South Dakota	226	3	223	3	219	4	218	4
Utah	219	6	222	4	217	5	216	5
U.S.	219	-	217	-	216	-	215	-
	Scale Score Diff SD-NSD	Rank	Scale Score Diff SD-NSD	Rank	Scale Score Diff SD-NSD	Rank	Scale Score Diff SD-NSD	Rank
Wyoming	-18	2	-21	2	-21	1	-26	2
Colorado	-28	7	-32	6	-35	6	-39	6
Idaho	-26	6	-27	5	-30	4	-33	5
Montana	-24	5	-27	5	-31	5	-26	2
Nebraska	-20	4	-24	4	-26	3	-26	2
North Dakota	-17	1	-20	1	-25	2	-28	3
South Dakota	-19	3	-21	2	-25	2	-25	1
Utah	-24	5	-23	3	-30	4	-30	4
U.S.	-22	-	-26	-	-28	-	-28	-

Table 3.4

Eighth Grade Reading

	2009		2011		2013		2015	
	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank
State	**Eighth Grade Reading**							
Wyoming	236	2	233	3	239	1	231	4
Colorado	226	4	228	6	230	4	224	6
Idaho	219	6	229	5	224	6	221	7
Montana	237	1	237	2	230	4	235	1
Nebraska	226	4	231	4	234	2	233	2
North Dakota	236	2	239	1	231	3	232	3
South Dakota	231	3	229	5	227	5	231	4
Utah	223	5	222	7	224	6	225	5
U.S.	226	-	228	-	228	-	226	-
	Scale Score Diff SD-NSD	Rank	Scale Score Diff SD-NSD	Rank	Scale Score Diff SD-NSD	Rank	Scale Score Diff SD-NSD	Rank
Wyoming	-36	2	-41	3	-37	1	-43	4
Colorado	-43	5	-46	4	-45	4	-49	5
Idaho	-49	8	-41	3	-49	6	-52	6
Montana	-37	3	-39	2	-46	5	-39	1
Nebraska	-45	6	-41	3	-40	2	-42	3
North Dakota	-35	1	-32	1	-41	3	-40	2
South Dakota	-41	4	-43	4	-45	4	-40	2
Utah	-46	7	-48	5	-50	7	-49	5
U.S.	-40	-	-39	-	-42	-	-43	-

Table 3.5
Eighth Grade Math

	2009		2011		2013		2015	
	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank	SD Scale Score	Rank
State	Eighth Grade Math							
Wyoming	252	3	253	3	255	2	252	2
Colorado	248	5	248	5	245	5	241	6
Idaho	242	7	240	8	243	6	241	6
Montana	243	6	247	6	252	3	246	5
Nebraska	251	4	250	4	249	4	251	3
North Dakota	267	1	264	1	256	1	253	1
South Dakota	254	2	254	2	242	7	248	4
Utah	242	7	241	7	237	8	240	7
U.S.	246	-	247	-	245	-	243	-
	Scale Score Diff SD-NSD	Rank	Scale Score Diff SD-NSD	Rank	Scale Score Diff SD-NSD	Rank	Scale Score Diff SD-NSD	Rank
Wyoming	-38	3	-39	3	-38	1	-40	2
Colorado	-42	5	-48	6	-49	4	-48	6
Idaho	-49	7	-50	7	-46	3	-47	5
Montana	-53	8	-51	8	-41	2	-46	4
Nebraska	-37	2	-37	2	-41	2	-40	2
North Dakota	-28	1	-31	1	-38	1	-39	1
South Dakota	-40	4	-40	4	-50	5	-41	3
Utah	-45	6	-46	5	-52	6	-51	7
U.S.	-40	-	-40	-	-43	-	-43	-

IV. Conclusions and Recommendations

Conclusions

District expenditure choices are the driving feature in establishing state funding for special education, particularly district salary and benefit levels and the intensity of the use of personnel. One result of the reimbursement approach has been wide variations in spending and reimbursement for special education students across districts, resulting in a 2.6:1 expenditure differential between the lowest ($11,969 per student) and highest spending districts ($30,741) in the state. The remainder of the districts are somewhat clustered in the middle, with 67 percent of the districts within +/– $4,000 around the median spending level ($18,662).

The procedures for funding special education in Wyoming are straightforward. Districts budget and expend monies for special education students. They record these expenditures in the appropriate state form, *Annual Special Education Expenditure Report* (WDE 401), and submit the information to WDE for review and approval. WDE personnel review the expenditures. If there are unexplained changes in expenditures or number of special education students, they contact the districts to resolve their questions. Once resolved, the special education expenditures for the previous year are approved and reimbursed.

There are few current regulations or guidelines regarding the amount or distribution of special education expenditures (as long as they qualify as legitimate for special education). Since the state funding model is a reimbursement approach for prior year approved expenditures, there are no fiscal or program or student factors that guide or direct state funding. As a result, there are no means of evaluating the spending differentials across districts or determining whether or not they are appropriate.

Federal Considerations

As the state considers changes to the current special education reimbursement model, the state needs to consider federal requirements related to Maintenance of Fiscal Support (MFS) and Maintenance of Effort (MOE).

If Wyoming fails to maintain fiscal support for special education and is not granted a waiver, its federal allocation would be reduced dollar for dollar of the shortfall in fiscal support. The MFS is a statewide aggregate amount of spending related to IDEA (Wyoming received approximately $22.5 million in IDEA federal funds for FY16-17). For FY 2015-16, Wyoming's calculated MFS, including the BHD (Wyo. Dept. of Health division) and other state level budgets, was about $260 million. MFS compliance is determined by the amount of state financial support *provided or made available*, regardless of how much was spent.

The state is also required to ensure that any local education agency (LEA) receiving IDEA funds complies with local MOE requirements. This requirement is separate from MFS. If a district fails to meet effort, the state must repay (using non-federal funds) the difference between what the district actually expended and what they should have spent to meet effort. It is important to note that there are no waivers for MOE, only "exceptions."

Allowable exceptions for a district include:

- voluntary or for-cause departure of special education staff,
- decrease in enrollment of IDEA eligible children,
- termination of an exceptionally costly program for a particular child, under certain circumstances,
- termination of costly expenditures for long-term purchases, and
- assumption of cost by its state's high-cost fund.

Recommendations

Given the limitations on changes to the current model due to federal requirements and the overwhelming stakeholder feedback in support of the reimbursement model, the study team recommends improving special education funding through the existing approach. There are certain aspects of the current approach that, if upgraded, could lead to improved efficiencies and more equal distributional results.

A first step to increase efficiencies in special education would be to increase WDE oversight of district expenditures to identify areas in which greater efficiencies in district operations could be achieved. As a guideline, WDE staff could begin with an exception approach to review the instructional programming practices, types and related services provided to students, staffing patterns by types of staff, and enrollments and identification practices of those districts at the high and spending extremes (i.e. the outlier districts). What are these districts doing that either raises or minimizes their costs? Are they applicable to other districts? Do they have a positive or negative impact on students and learning outcomes? This would offer opportunities to understand actual district practices in more detail, find good practices to share more broadly across the state, and make recommendations on improving district practices and efficiencies. With a broader perspective, WDE staff are also in a position to identify, recommend, and support cross-district opportunities for shared services and more efficient joint operations.

A parallel effort to develop and implement specific activities and state oversight is recommended. These actions focus on WDE and educational policy initiatives that can improve efficiencies in special funding and implementation for the state and districts.

1. <u>Create program guidelines to identify best practices for instructional programming to guide districts to improve their operations</u>. Draw on the review of current district practices in Wyoming as well as educational and instructional research to build an inventory of effective practices for districts to consider and implement.

2. <u>Establish staffing guidelines</u>. Develop a set of recommended or expected student/staff ratios or caseloads for the major types of service delivery options for various types of special education students. The guidelines could be either recommended or mandated. Generally, the ratios should

specify ranges of practice, rather than a single number, to allow for individual district circumstances, particularly the potential case of fewer students in the district than is identified in the guidelines. It is unknown whether the recommended staffing guidelines would be more or less than currently seen in districts, so it cannot yet be determined if there would be MOE implications.

3. Examine the wide differences in incidence rates of special education students among districts. Students are brought into special education through an identification and evaluation process that is operated by school districts. At present, the results of these individual district processes yield substantial variation across districts in the number of students that are deemed qualified for and receive services for special education. An identification process that became more standardized across the state utilizing similar disability definitions, evaluation practices, and eligibility guidelines, would provide uniform eligibility for students and avoid excessive identification and special education placement, since once students enter the special education system, they tend to be retained in the system. Consequently, the initial evaluation for special education can commit a student to 12 years of special education and obligate the system to long-term, ongoing, multiple year costs. Improved initial evaluation practices and regular reevaluations can lead to fewer students involved in special education with lower system costs. The caveat for this approach is that the purpose and focus of the evaluations should be on providing appropriate special education services, not reducing costs.

4. Link instructional program guidelines to approved funding. Another aspect that can influence district expenditures and control costs is to link program standards and practices into funding. In other words, base special education reimbursements for districts on approved program practices. This is a much more complicated approach, as it involves creating (and maintaining) a range of approved program practices that districts can use, and it requires much more documentation and auditing to validate student eligibility, enrollment, the instructional practices, and the use of funds for special education. However, it does provide a means for the state to guide and influence district decision-making regarding special education resources that would be compatible with a cost-based funding model. Again, it is unknown if or how the approved instructional programs and practices would be different than current district practice, so it cannot yet be determined if there would be MOE implications.

5. Utilize BOCES to a greater extent to provide additional special education services. The residential BOCES are already established to provide efficient programs and services for low-incidence, high-cost disabled students on a regional basis. It would be appropriate to consider expanding services to selected other types of disabled students in nearby districts or throughout the state through instructional technology. A separate supplemental report addresses these opportunities.

6. Identify opportunities for shared services for personnel, equipment. There are many areas to improve efficiency through shared services to support special education students across multiple districts. A separate supplemental report addresses these opportunities.

7. <u>Use technology and distance education to provide special educational programs for students in multiple and remote districts</u>. Given the small special education populations, large area, and long distances between schools and districts, educational technology is an approach that could both broaden the reach of needed special education programs to widespread students and do so at an efficient cost. One instructor, using distance education equipment, is able to serve multiple students in multiple locations simultaneously, spreading the cost of the instructor (and other program costs) over a larger number of far-flung students.

AUGENBLICK, PALAICH AND ASSOCIATES

APA CONSULTING

Supplemental Report F

Review of the Transportation Reimbursement Model

Prepared for the

Select Committee on School Finance Recalibration

By

Robert Schoch and Dr. William Hartman

Education Finance Decisions

On Behalf of

Augenblick, Palaich and Associates

Final, January 12, 2018

Contents

I. Introduction

The purpose of this study is to evaluate the transportation funding formula and the factors that affect reimbursement. Based on this evaluation, various options to refine the formula are presented with recommendations. The study involves extensive data analysis to identify issues and trends in the factors that drive transportation costs and reimbursement. This analysis identifies factors that can be incorporated into incentives for efficiency and proposes to target incentives for the greatest long-term financial benefit. It also discusses programs necessary to implement efficiency incentives.

The study explains background information on the funding formula. It reviews reimbursement trends by school district types. Financial and operational factors are analyzed and compared among school districts. The importance and relevance of each factor is explained. This analysis provides examples to illustrate the widely varied requirements and transportation systems used by school districts.

While reading the study, it may be helpful to understand that one approach is to modify components of the current funding system to incorporate best practices in transportation efficiency. Another approach is to establish a formula that reimburses districts based on student population density, either linear or by area of the school district. This approach is used by a number of states when reimbursing school bus transportation. A transition approach is recommended to establish best practices for various density groups over a three-year period followed by transition to a density approach.

Background on the Funding Formula

Through school year 2017-18, transportation funding in Wyoming was governed by *Rules for the Pupil Transportation Component with the Education Resource Block Grant Model*,[1] which Wyoming adopted in 2012. The formula establishes reimbursable and non-reimbursable expenditures for operations, maintenance, and capital costs of each school district's transportation system. Reimbursement is based on amounts expended the previous year for transportation of children to and from school, field trips, and activity trips.

The reimbursable costs include: (1) activity trip expenses; (2) advertising expenses; (3) administrative cost and benefits for supervisors, mechanics, clerical support, bus and loading zone aides, other personnel assigned to the transportation department; (4) bus maintenance equipment; (5) bus garage utilities; (6) communication services; (7) computer expenses; (8) contracted services; (9) field trip expenses; (10) Global Positioning Systems; (11) insurance for buses and bus garage; (12) isolation and maintenance; (13) periodicals; (14) physical examinations for bus drivers; (15) purchased services; (16) school bus repairs and maintenance; (17) school bus driver salaries and benefits; (18) supplies; (19) training expenses/professional development; (20) travel costs; and (21) video cameras.

Certain non-reimbursable costs are excluded from the funding formula and must be provided through local funding. The non-reimbursable costs include: (1) purchase of staff vehicles, non-school bus vehicles, and non-conforming vehicles; (2) maintenance and repair of staff vehicles, non-school bus vehicles, and non-conforming vehicles; (3) expenses incurred as a result of busing students from a large attendance center to a small attendance center in an effort to keep the smaller attendance center open

[1] Wyoming Administrative Rules, Chapter 20.

or increase its average daily membership; (4) indirect costs; (5) reclining school bus seats and related repair costs; and (6) bus garage and site repairs and maintenance.

The rules and regulations for school bus transportation establish the operating standards. These include the minimum walking distance, which varies by grade level. Elementary minimum walking distances are 1.0 miles. Middle school distances are 1.5 miles, and high school distances are 2.0 miles. Hazardous circumstances can allow busing at closer distances. Transportation provided within the walking zones is not reimbursed unless hazardous factors exist.

School bus purchases and leases are also reimbursed subject to detailed regulations that control bus equipment and design standards. Safety features in the regulations include crossing arms, Global Positioning Systems (GPS), and video cameras. The regulations establish life cycles and require vehicles to be disposed of when replaced. Replacement with a larger bus must be justified to the Wyoming Department of Education (WDE). Districts requesting additional vehicles must address the issue of using buses for multiple routes. The size of the bus fleet is fixed at 1999 levels, and is reviewed if average daily membership (ADM) decreases by 15 percent or more over three years. Justification is required for increasing the fleet size.

In the 2017 General Session the Legislature changed the funding method for transportation operations and maintenance and bus purchases. Beginning with school year 2018-19, funding for transportation operations and maintenance will equal the average of the transportation reimbursement amounts paid to districts for school years 2014-2015, 2015-2016, and 2016-2017. These amounts are frozen for future school years unless the Legislature acts to resume reimbursing actual costs or adopts a new funding formula.[2] The fiscal impact of this change is discussed later in this report.

The change in transportation funding also changed reimbursements for bus purchases and leases, restricting funding for bus replacement to emergency situations only.

While the state's regulations provide some stability to costs and reimbursement levels, factors beyond the control of state or local education agencies can affect transportation operations and cost. At a national level, the legal requirements for homeless transportation have increased in the past decade and homelessness has been affected by economic conditions during the same period. New school locations may affect the number of students beyond walking distances. Other factors affecting costs and reimbursement levels include changing land development patterns where dispersed locations may require more bus stops and longer bus rides.

[2] See Wyoming Statutes Section 21-13-320, Subsections (j) through (m).

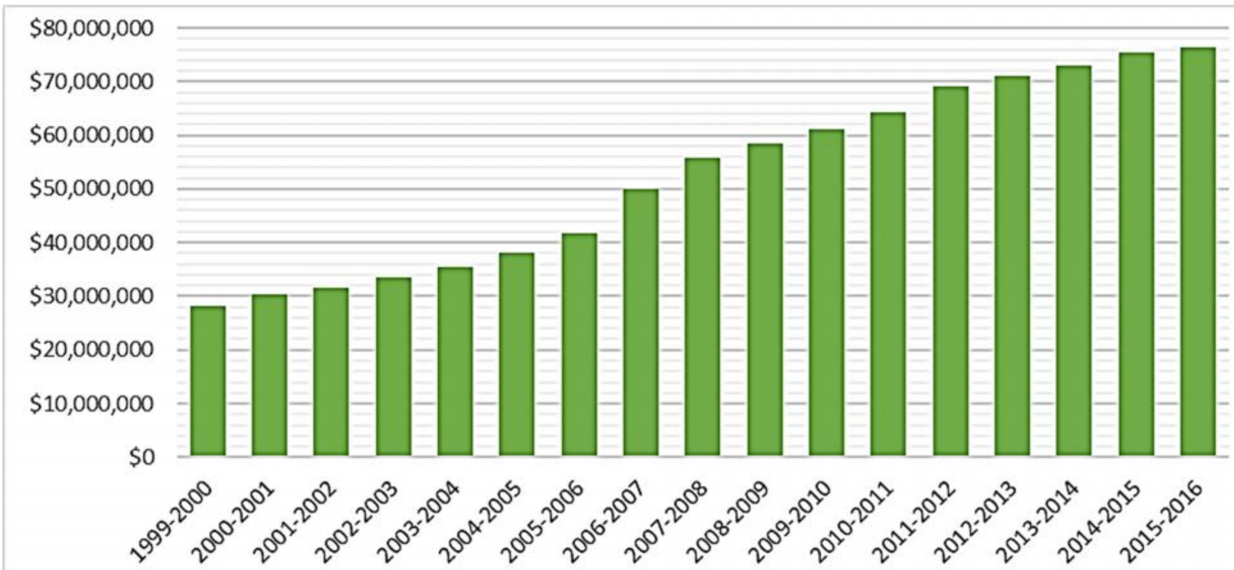
II. Findings

Trends in Transportation Reimbursement and Expenditures

Reimbursements: Statewide – All School Districts

Total reimbursement for all school districts in Wyoming has nearly doubled in the past decade, with a very large increase between 2005-06 and 2006-07. The increases are shown in the stacked bar chart on Figure 1. Certain large districts have increased more than other districts, indicating that efforts targeting those districts could have the greatest financial impact statewide.

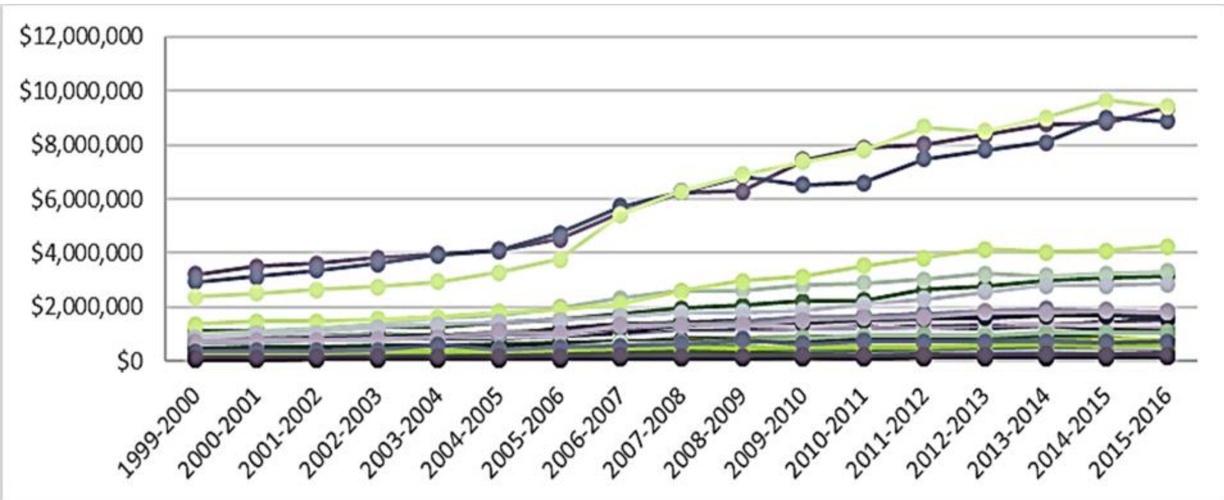
Figure 1. Transportation Reimbursement Trends



School District Level

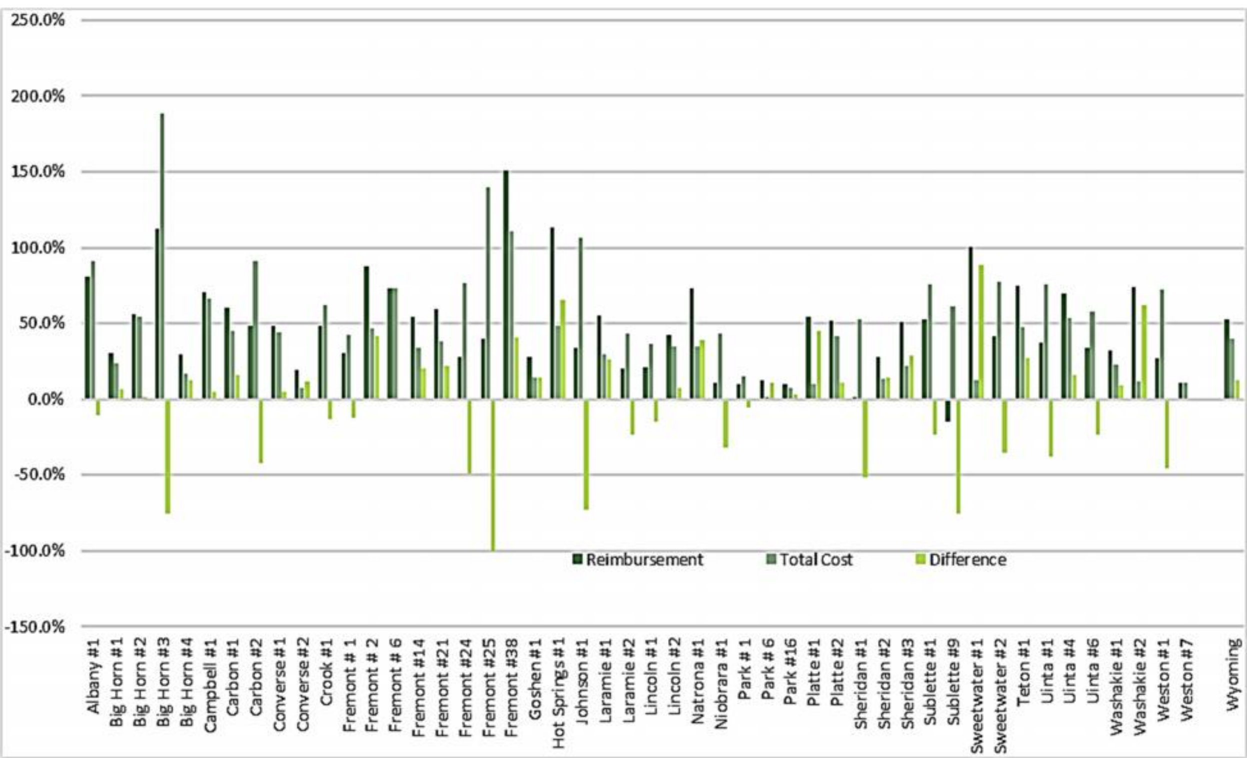
At the school district level, increases in three of the largest districts have outpaced increases in other districts, as shown in Figure 2. In these districts, reimbursement has increased over 300 percent since 2000.

Figure 2. Transportation Reimbursement Trends by District



District costs and reimbursements have varied widely over the past 10 years. Figure 3 indicates that the 52.8 percent increase in reimbursement exceeded the 40.1 percent increase in costs on a statewide basis. The largest district increase in cost was 188 percent, while the smallest was two percent. The largest increase in reimbursement was 151 percent and the smallest was 1.6 percent.

Figure 3. Cost and Reimbursement Percentage Change, 2006-07 to 2015-16



The comparison of reimbursement and cost over 10 years indicates that statewide cost increases exceeded reimbursement increases by $2,967,710 or 12.7 percent. Most districts experienced costs exceeding reimbursement, as shown Table 1.

Table 1
Reimbursement and Cost Change, 2006-07 to 2015-16

District	Change in Percentage			Change in Dollars		
	Reimbursement	Total Cost	Difference	Reimbursement	Total Cost	Difference
Albany #1	80.7%	91.0%	10.4%	$1,411,716	$1,839,612	($427,896)
Big Horn #1	30.1%	23.8%	-6.3%	$183,439	$195,552	($12,113)
Big Horn #2	56.3%	54.7%	-1.5%	$151,365	$195,045	($43,680)
Big Horn #3	112.5%	188.3%	75.8%	$318,044	$552,067	($234,023)
Big Horn #4	29.4%	17.1%	-12.3%	$94,630	$74,438	$20,192
Campbell #1	71.0%	66.6%	-4.4%	$3,892,307	$4,275,175	($382,868)
Carbon #1	60.6%	45.1%	-15.5%	$609,538	$567,402	$42,136
Carbon #2	48.4%	90.8%	42.4%	$304,787	$634,074	($329,288)
Converse #1	48.3%	43.9%	-4.4%	$396,382	$447,322	($50,940)
Converse #2	19.0%	7.6%	-11.4%	$73,799	$40,589	$33,209
Crook #1	48.7%	62.2%	13.5%	$465,056	$759,832	($294,776)
Fremont # 1	30.3%	42.5%	12.2%	$323,177	$549,987	($226,810)
Fremont # 2	88.0%	46.3%	-41.7%	$123,104	$323,268	($200,164)
Fremont # 6	73.3%	72.8%	-0.5%	$248,154	$134,525	$113,628
Fremont #14	54.2%	34.2%	-20.0%	$269,572	$124,866	$144,706
Fremont #21	59.9%	37.8%	-22.1%	$181,116	$208,491	($27,375)
Fremont #24	27.8%	76.8%	49.0%	$119,961	$765,960	($645,999)
Fremont #25	39.6%	139.6%	100.0%	$351,362	$607,864	($256,502)
Fremont #38	151.1%	110.8%	-40.3%	$592,132	$435,920	$156,212
Goshen #1	27.8%	13.9%	-13.8%	$378,940	$241,205	$137,735
Hot Springs #1	113.5%	48.4%	-65.2%	$462,721	$524,134	($61,413)
Johnson #1	33.7%	106.6%	72.9%	$280,644	$286,031	($5,387)
Laramie #1	55.2%	29.3%	-25.9%	$3,162,328	$2,791,865	$370,464
Laramie #2	20.0%	43.4%	23.4%	$274,869	$591,637	($316,768)
Lincoln #1	20.8%	36.0%	15.2%	$87,068	$156,455	($69,387)
Lincoln #2	42.0%	34.4%	-7.6%	$977,503	$946,920	$30,583
Natrona #1	73.4%	34.4%	-39.0%	$3,979,534	$3,064,886	$914,647
Niobrara #1	10.9%	43.2%	32.3%	$49,535	$85,667	($36,132)
Park # 1	9.9%	15.0%	5.1%	$84,486	$16,039	$68,447
Park # 6	12.8%	1.7%	-11.1%	$154,270	$16,107	$138,163
Park #16	10.2%	7.3%	-2.9%	$18,486	$146,752	($128,266)
Platte #1	54.3%	9.8%	-44.5%	$386,836	$401,357	($14,521)
Platte #2	52.1%	41.5%	-10.6%	$53,011	$86,304	($33,293)
Sheridan #1	1.6%	53.0%	51.4%	$11,069	$93,601	($82,531)
Sheridan #2	27.7%	13.1%	-14.6%	$341,168	$349,395	($8,226)
Sheridan #3	50.9%	22.1%	-28.8%	$99,606	$183,543	($83,938)
Sublette #1	52.4%	75.5%	23.1%	$366,925	$511,212	($144,287)
Sublette #9	-15.0%	60.9%	75.9%	($99,321)	$88,545	($187,866)
Sweetwater #1	100.8%	12.4%	-88.4%	$2,128,928	$2,248,923	($119,995)
Sweetwater #2	41.7%	77.2%	35.5%	$534,857	$771,738	($236,881)
Teton #1	74.4%	47.1%	-27.3%	$1,225,468	$1,483,272	($257,804)
Uinta #1	37.6%	75.9%	38.3%	$499,879	$740,673	($240,794)
Uinta #4	70.0%	53.9%	-16.1%	$247,630	$310,896	($63,266)

District	Change in Percentage			Change in Dollars		
	Reimbursement	Total Cost	Difference	Reimbursement	Total Cost	Difference
Uinta #6	34.1%	57.4%	23.4%	$156,490	$127,677	$28,813
Washakie #1	31.9%	22.5%	-9.4%	$141,038	$63,596	$77,442
Washakie #2	73.9%	11.6%	-62.3%	$72,331	$89,390	($17,059)
Weston #1	26.6%	72.3%	45.7%	$148,855	$78,690	$70,166
Weston #7	11.1%	10.9%	-0.2%	$23,266	$97,268	($74,002)
Wyoming	52.8%	40.1%	-12.7%	$26,358,061	$29,325,772	($2,967,710)

Reimbursement per Student

The reimbursement per student transported is more than five times higher in some districts than others, as shown on Figure 4. To understand reasons for this variation, transportation costs and operational factors were analyzed to understand the reasons for the cost and reimbursement increases.

Figure 4. Transportation Reimbursement per Student Transported, 2015-16

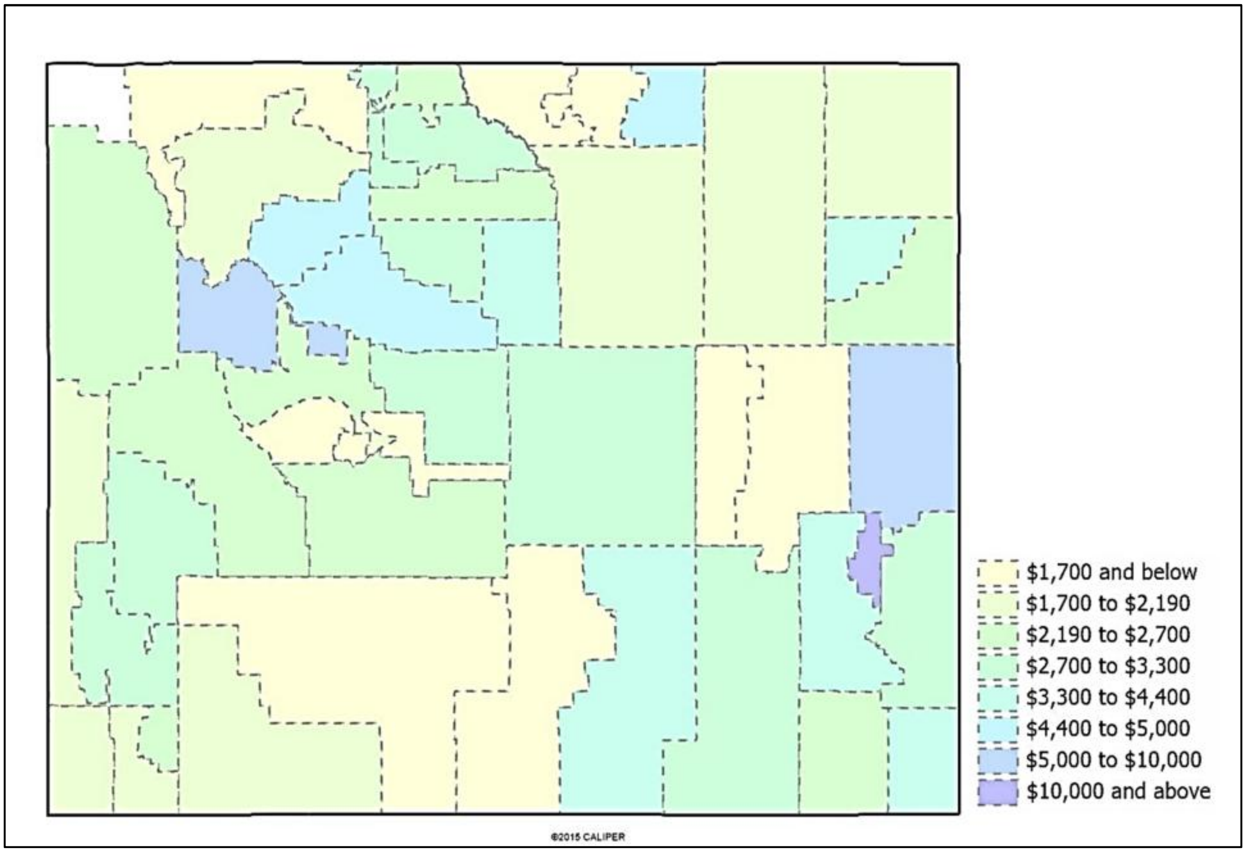
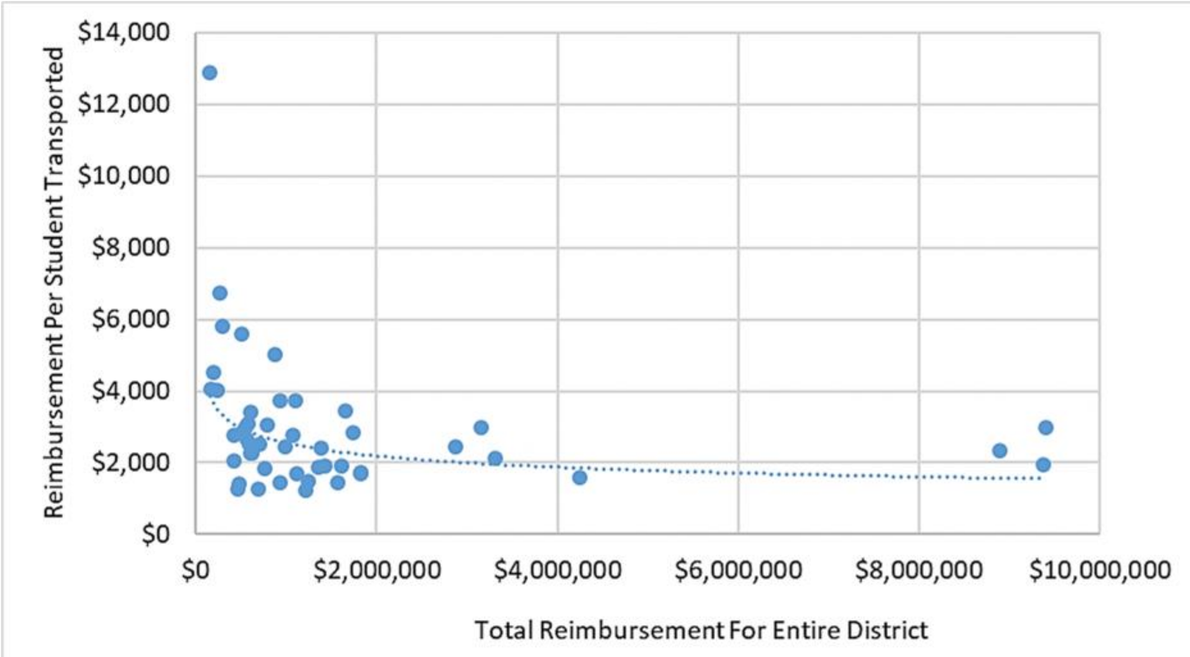


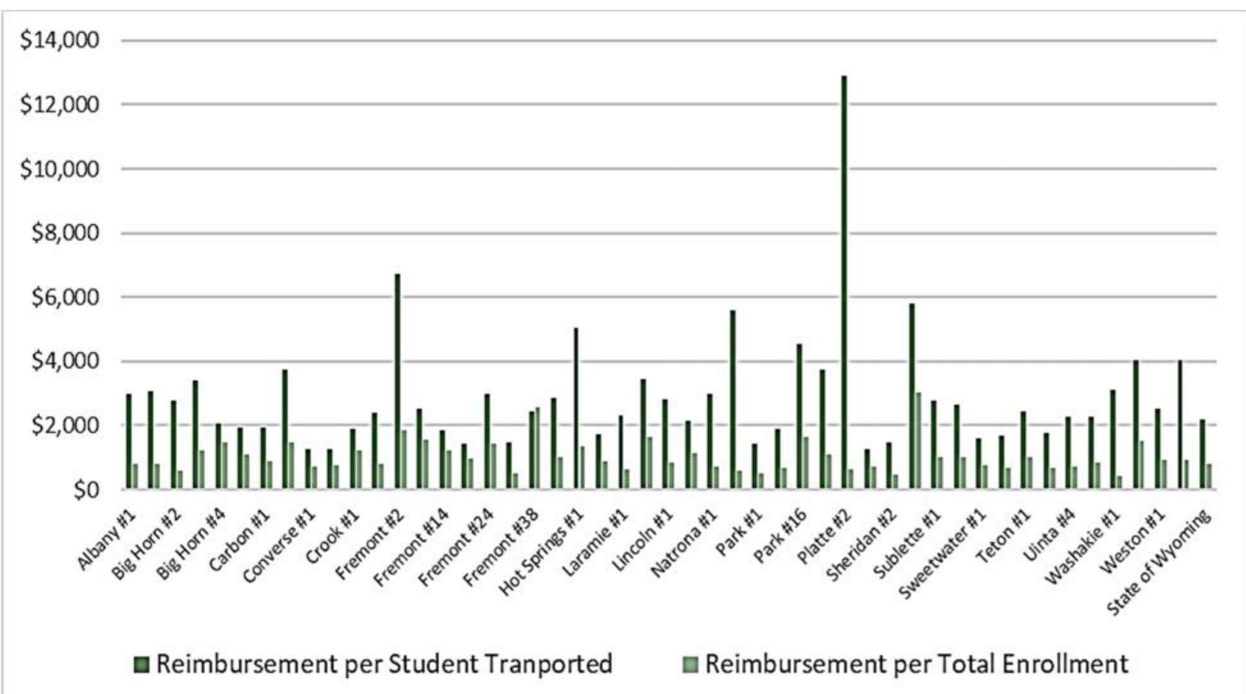
Figure 5 indicates that a number of small districts have a very high reimbursement per student transported, while most school districts have reimbursement between $1,000 and $3,000 per year.

Figure 5. Transportation Reimbursement by District Size and Number of Students Transported



Transportation reimbursement per student transported is compared to transportation reimbursement for all students enrolled in the district in Figure 6. Reasons for high amounts of per student transported include widely distributed populations and schools located beyond walking zones.

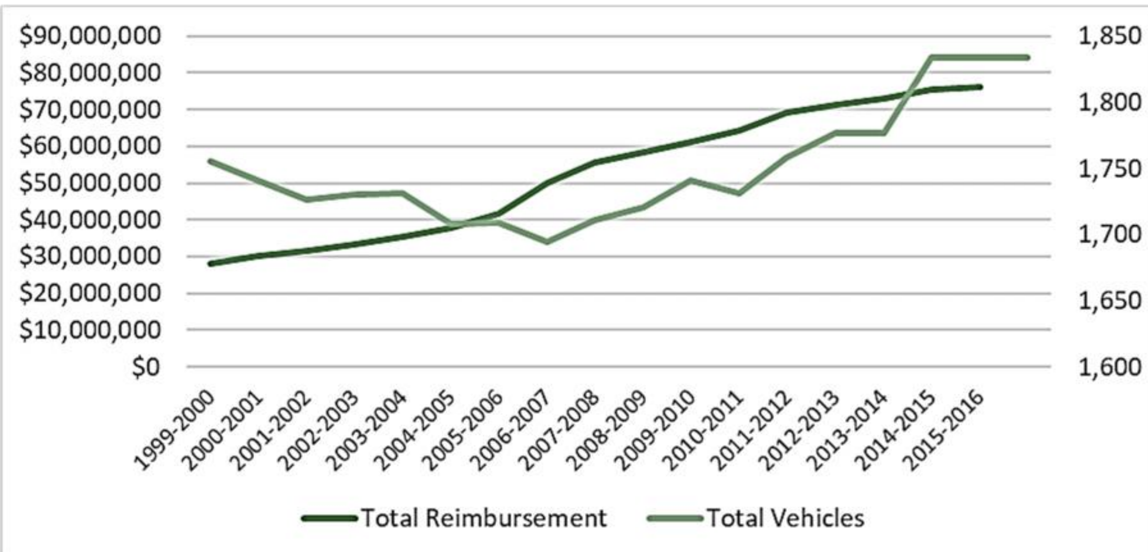
Figure 6. Transportation Reimbursement by Students Transported and by Total Students Enrolled



Reimbursement per Vehicle

On a statewide basis, reimbursement is increasing steadily, but the number of vehicles is increasing more rapidly, as shown in Figure 7. By increasing the number of vehicles, the costs of bus drivers, including salaries and benefits, also increase rapidly. This points to the importance of making capital decisions with a method that improves bus routing and utilization with the goal of reducing the number of buses and drivers.

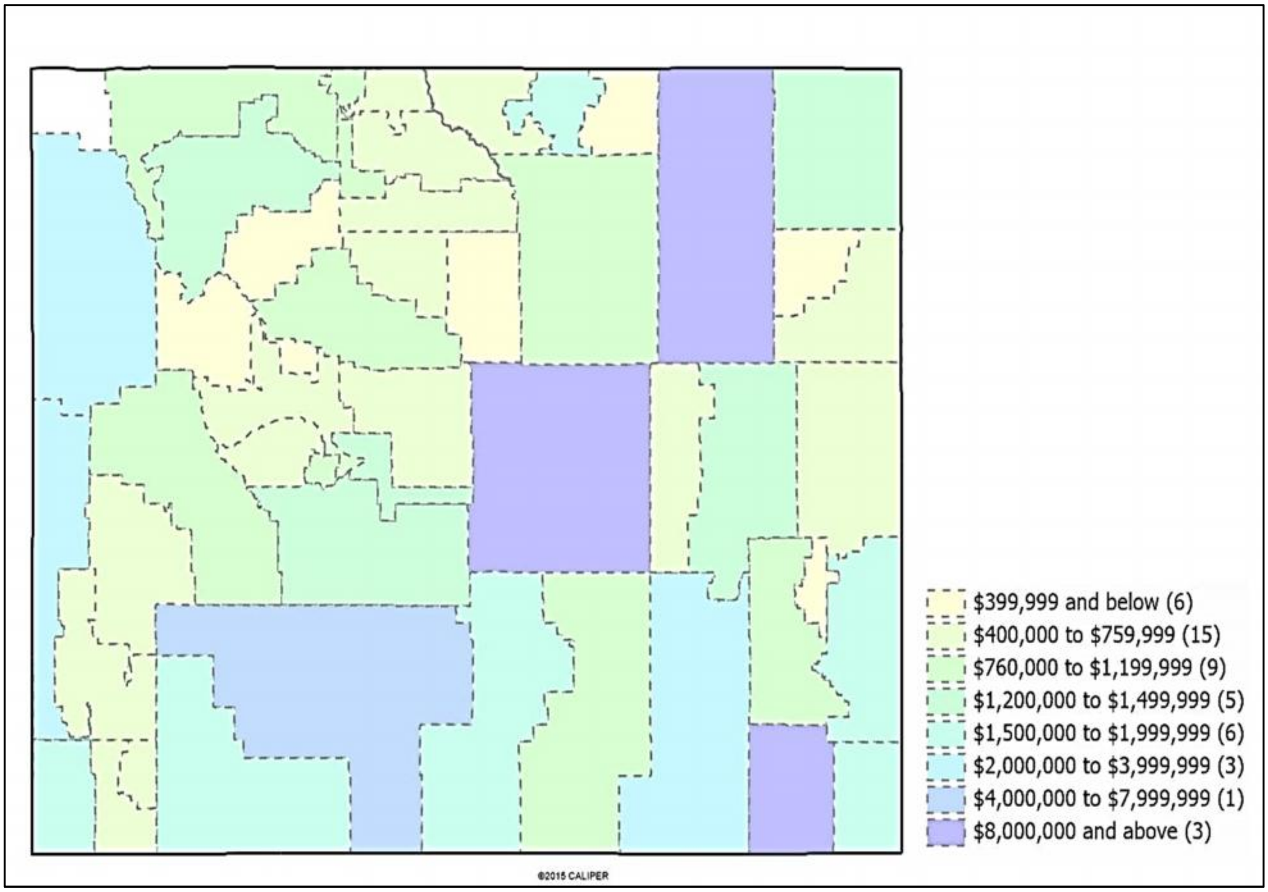
Figure 7. Total Reimbursement vs. Number of Vehicles



Total Reimbursement

To achieve maximum cost effectiveness statewide, it is important to recognize where most of the money is spent, as shown in Figure 8. The districts shown in dark blue receive over $8 million in transportation reimbursement annually. The reimbursement in the districts shown in lighter blue is between $4 million and $8 million per year. Lesser amounts are shown in the other colors. This indicates that measures to promote efficiency should concentrate on the districts with the highest total reimbursement.

Figure 8. Total Reimbursement by District, 2015-16



Conclusions on Transportation Reimbursements

The conclusions on transportation reimbursements provide insight on the importance of refining the funding formula as well as specific recommendations. Contrary to the purpose of the funding formula, reimbursement increases exceeded costs in most districts. This is largely due to increases in the number of buses, which affects the total cost of transportation, as each bus requires a driver, compensated in wages and benefits, which have outpaced inflation. Any proposed changes to the funding formula must recognize the variations in funding by student, caused largely by district geography and enrollment.

Transportation Cost Analysis

Total Transportation Costs

The total transportation costs by type of expenditure are shown in Figure 9. This indicates that salaries, retirement, and healthcare insurance comprise the largest cost. Vehicle costs represent the next largest expense, followed by fuel and supplies. Efficient bus routes require fewer drivers and vehicles and thereby control costs.

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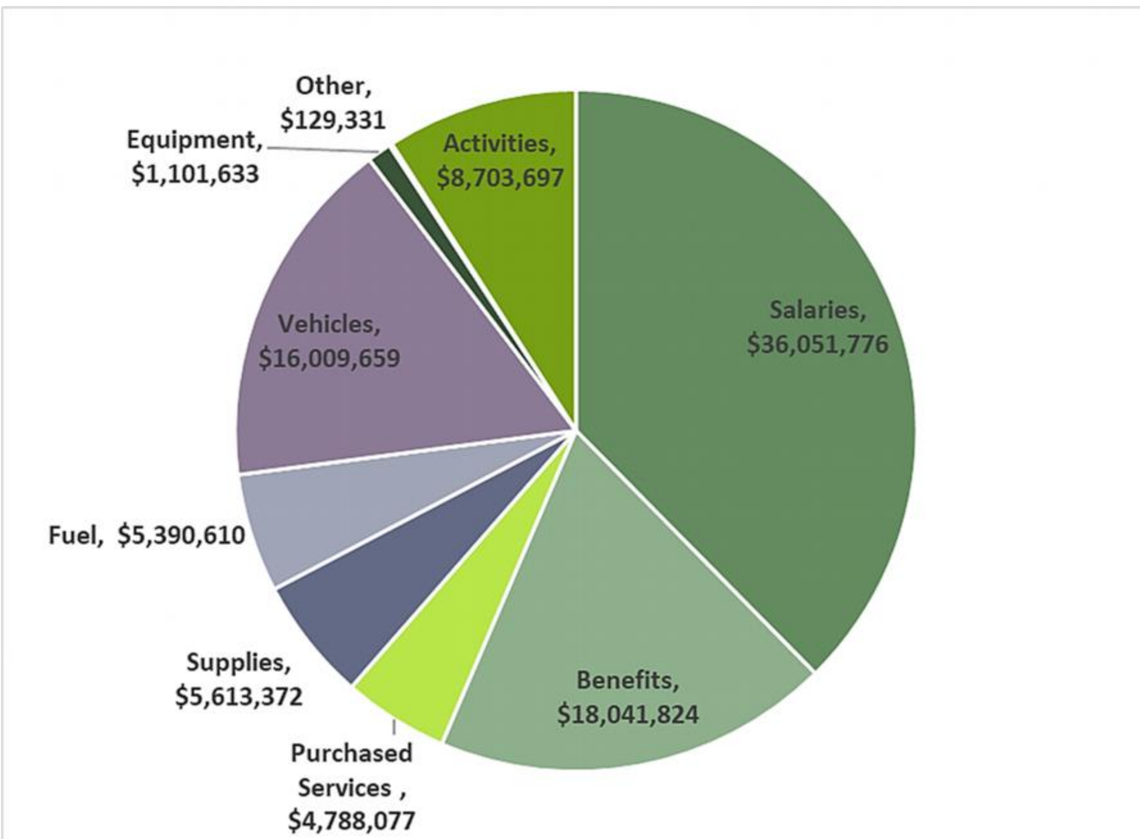
Figure 9. Transportation Expenditures by Category, All Districts (2016-17)



Transportation Costs Per Mile

The cost per mile showed wide variation between districts, from under $2 per mile in some districts to over $6 per mile in others. Because of the number of school districts, the information is shown in two charts, Figures 10 and 11. The first is for districts spending under $2.50 per mile in 2006-07 and the second shows the districts with higher initial spending. In both cases, the cost increases vary widely among districts and district trends show variation due to capital costs in certain years.

Figure 10. Cost per Mile Trend, Lower-Cost Districts

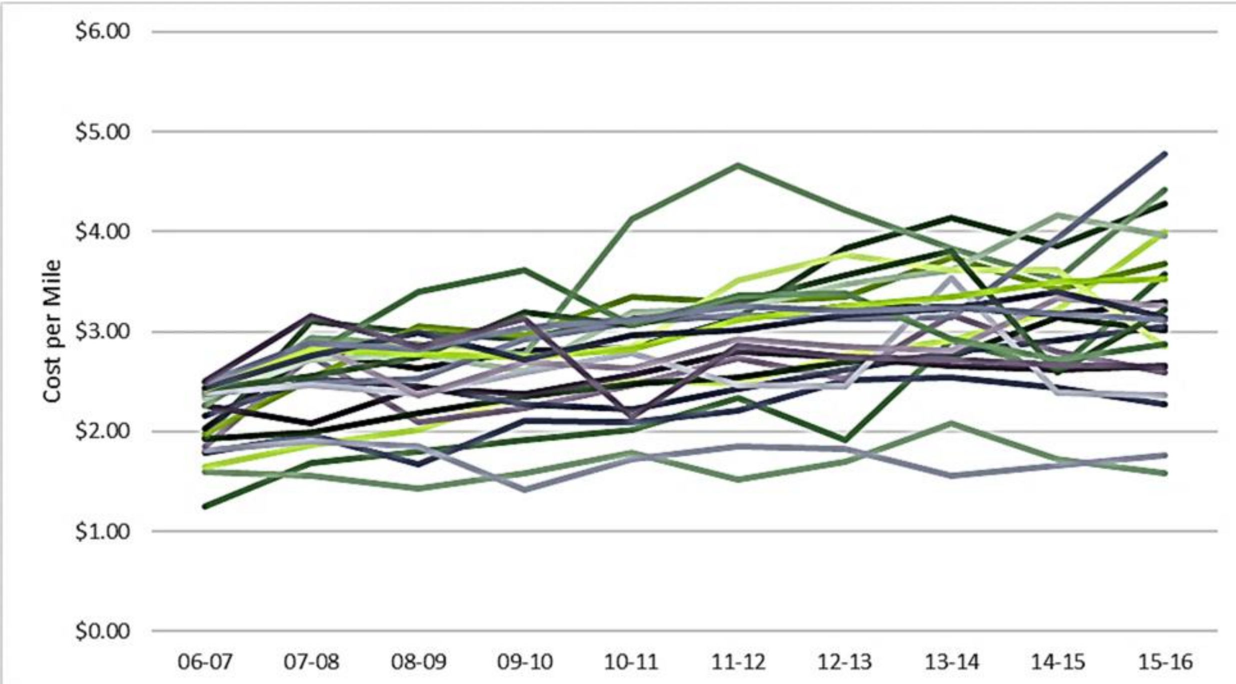
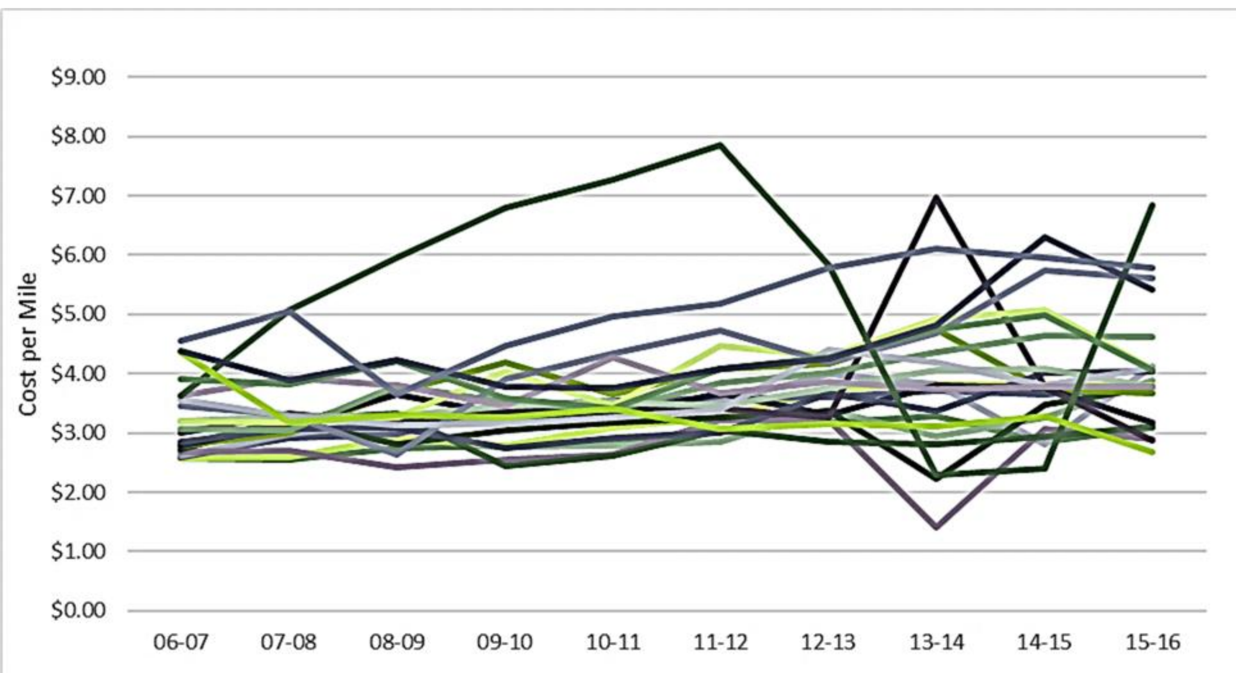


Figure 11. Cost per Mile Trend, Higher-Cost Districts



The percentage change in cost per mile by district indicates that many districts have exceeded 50 percent increases in the past decade and four have experienced increases of 100 percent or more. These increases are largely due to rapid increases in the cost of salaries and benefits. These numbers can also be affected by a district reducing mileage due to changing student populations or more efficient routing, yet maintaining fixed costs because the amount of reduction has not been enough to allow reduction of buses and the related staffing costs. Figure 12 presents the trend in costs per mile over time, while Figure 13 provides a map illustrating cost per mile by district for FY 2015-16.

Figure 12. Percentage Change Cost per Mile, 2006-07 to 2015-16

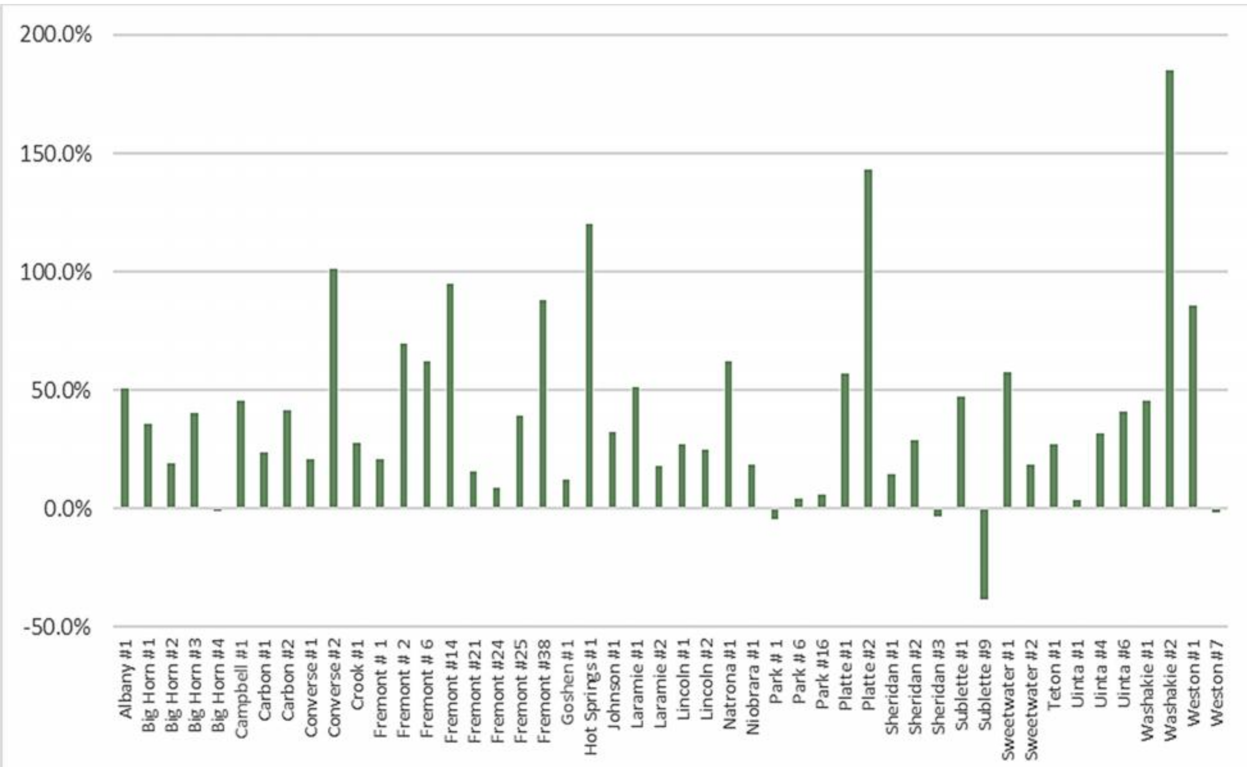
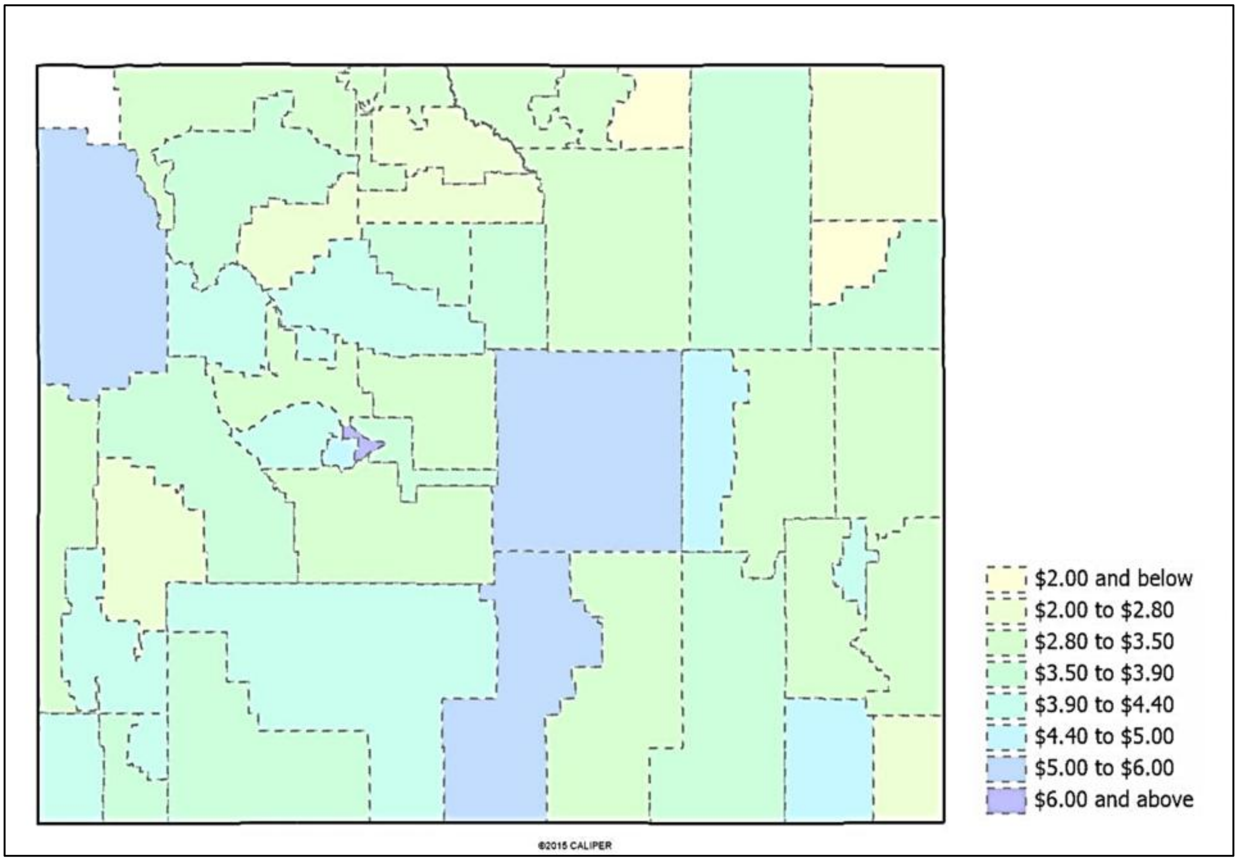


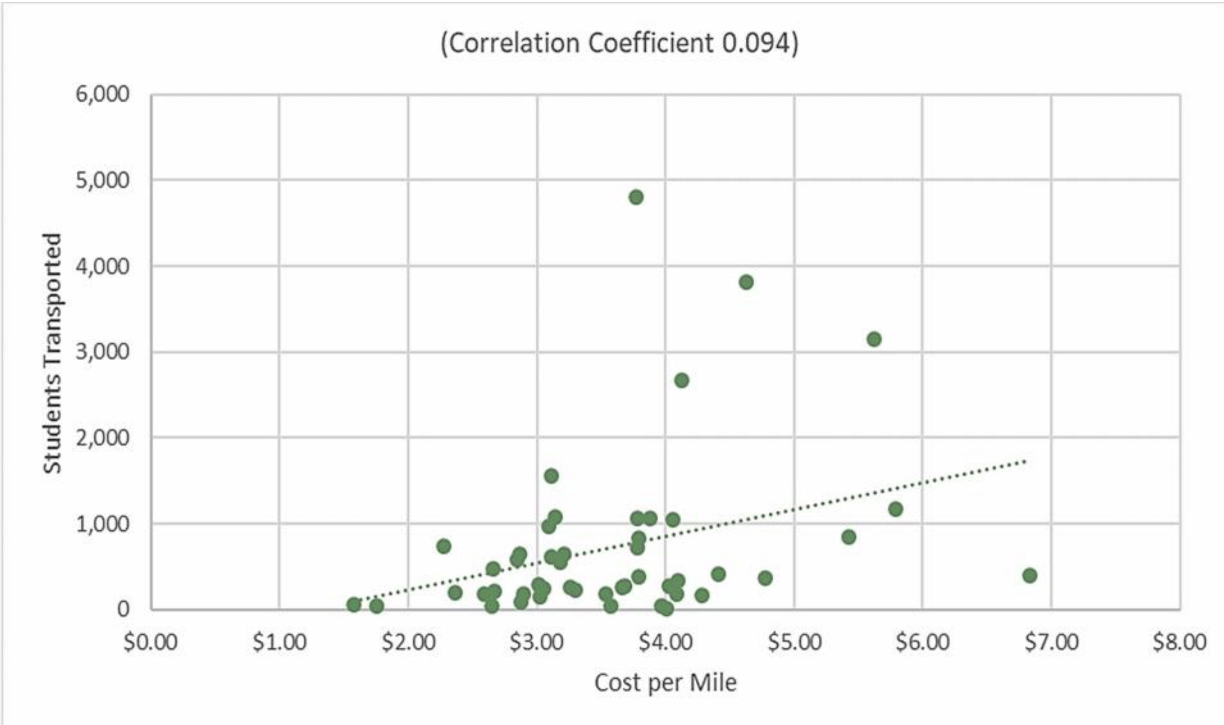
Figure 13. Cost per Mile by District, 2015-16



School District Cost per Mile vs. Students Transported

The scattergram below, Figure 14, shows a weak relationship between cost per mile and the number of students transported.

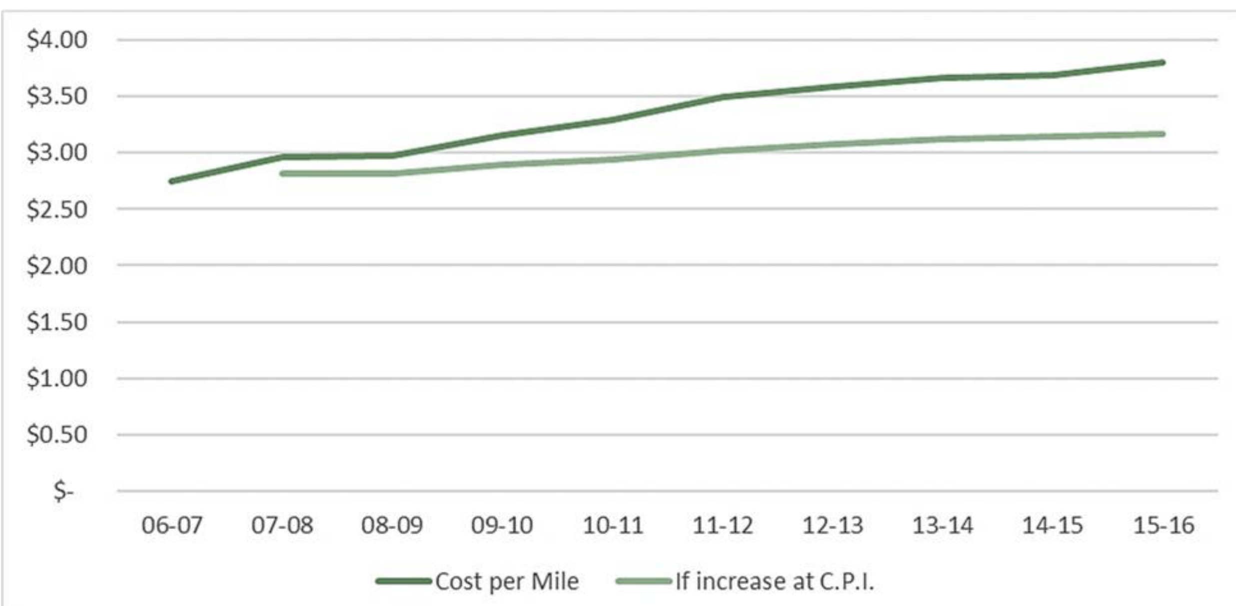
Figure 14. Cost per Mile vs. Students Transported, 2015-16



Cost per Mile Compared to the Consumer Price Index (CPI)

The increase in the cost per mile on a statewide basis has exceeded the Consumer Price Index (C.P.I.) as shown on Figure 15 below.

Figure 15. Statewide Cost per Mile vs. Cost if Increased at C.P.I.



Trends in Expenditure Components, All Districts

Analysis indicates significant variation in cost increases among the various transportation cost components, as summarized in Table 2.

Table 2

Percentage Increase in Transportation Costs, 2006-07 to 2015-16

Cost Component	Percent Increase
Personal Services – Salaries	50%
Personal Services – Employee Benefits	93%
Purchased Services	48%
Supplies and Materials	17%
Capital Outlay	123%

The costs for significant components are shown in the following figures salaries (Figure 16), retirement (Figure 17), group insurance/health care (Figure 18), supplies (Figure 19), gasoline (Figure 20), and vehicles (Figure 21). These figures show that increases in certain large districts have outpaced the rest of the districts, reinforcing the conclusion that efforts to improve efficiency should be targeted at selected districts. These trend charts illustrate variable growth trends, but are not meant to identify or focus on individual school districts. The trend charts also identify a small number of possible data anomalies that should be addressed in the future as this type of data will be needed to establish best practices.

Figure 16: Salaries

Figure 17: Retirement Costs for Transportation Personnel

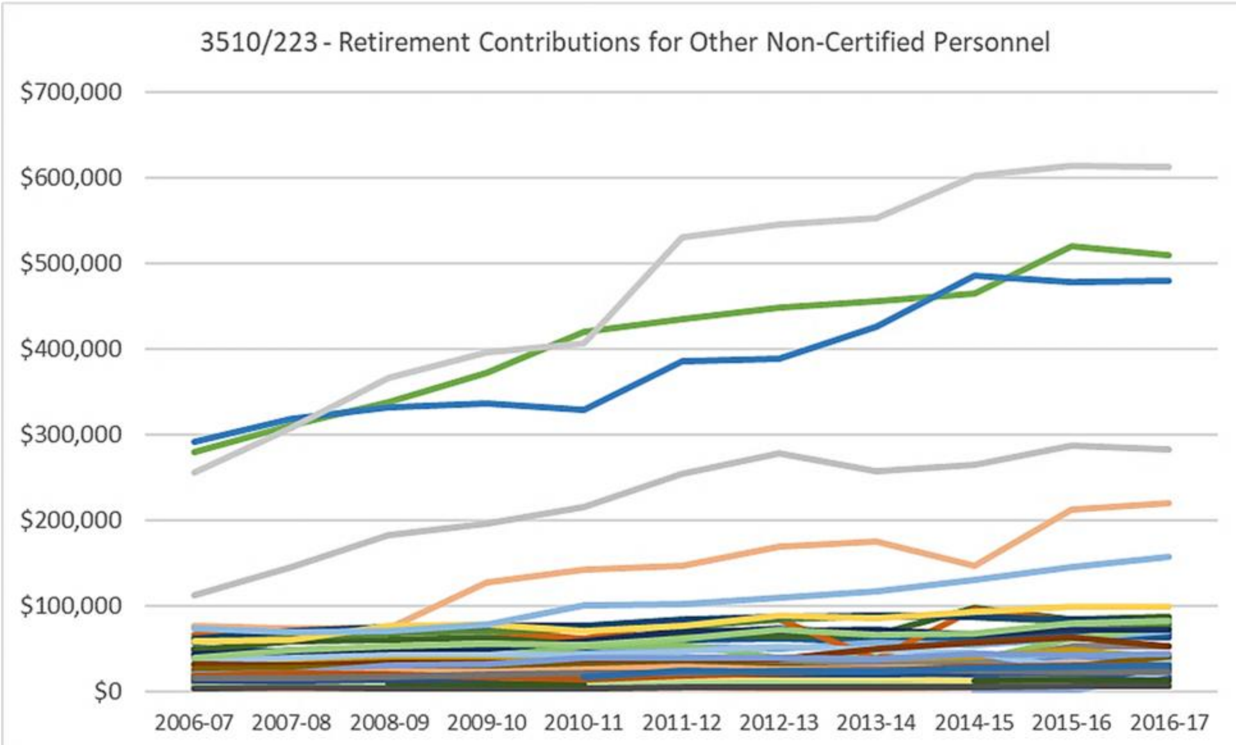


Figure 18: Group Insurance Costs for Transportation Personnel

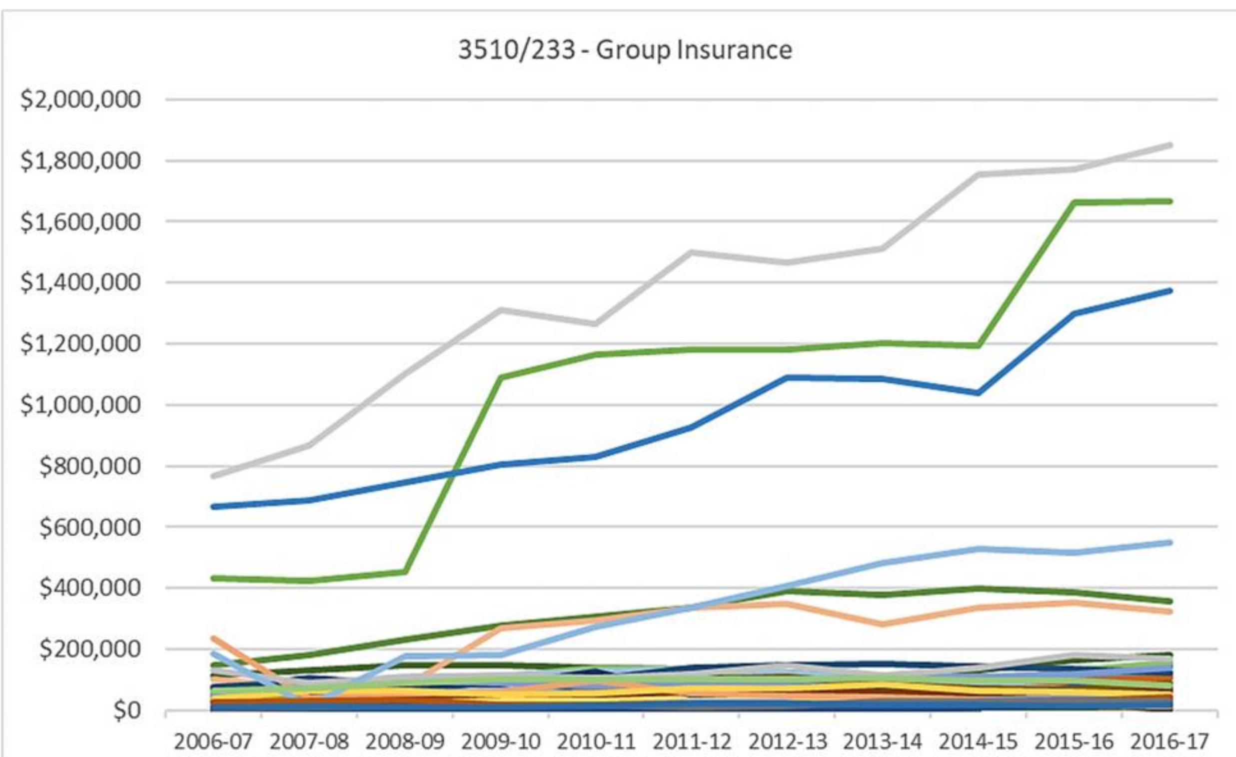


Figure 19: Supplies

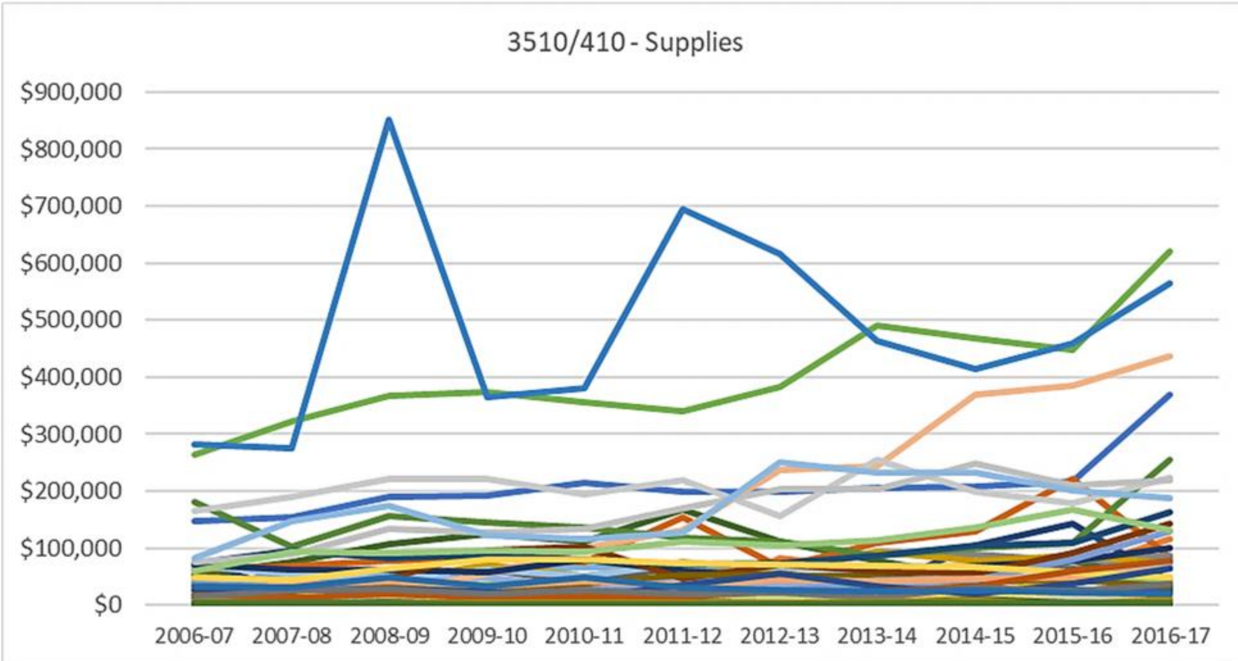


Figure 20: Gasoline

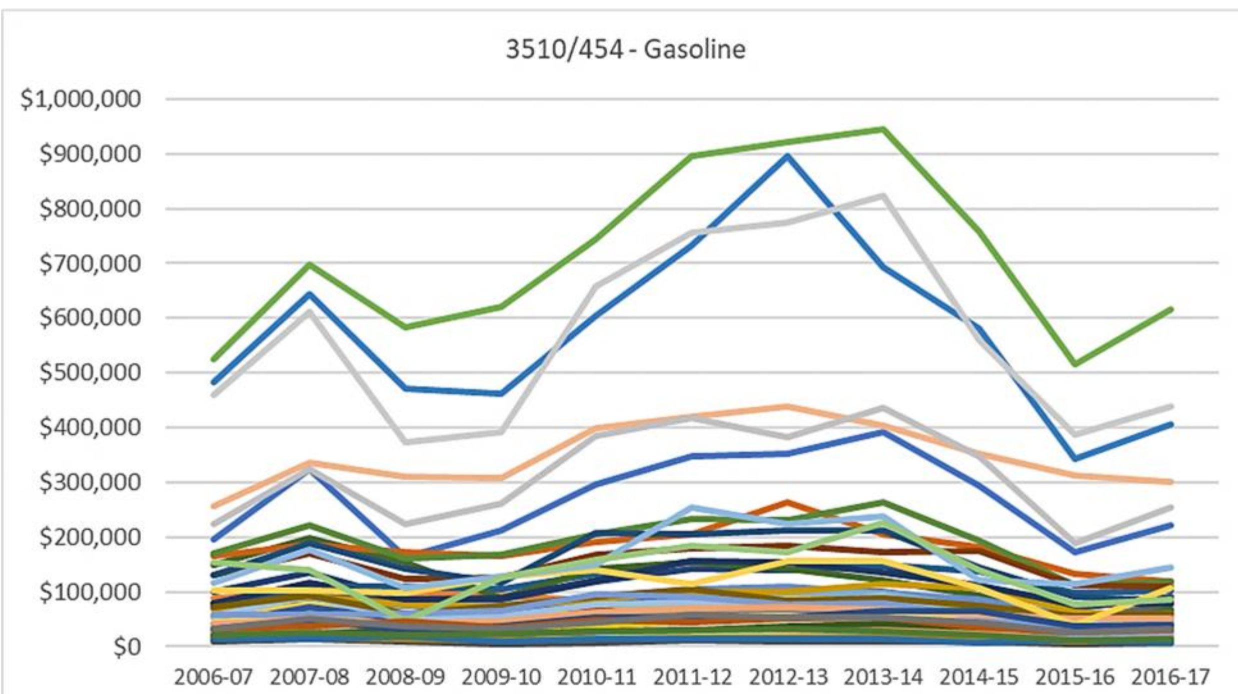
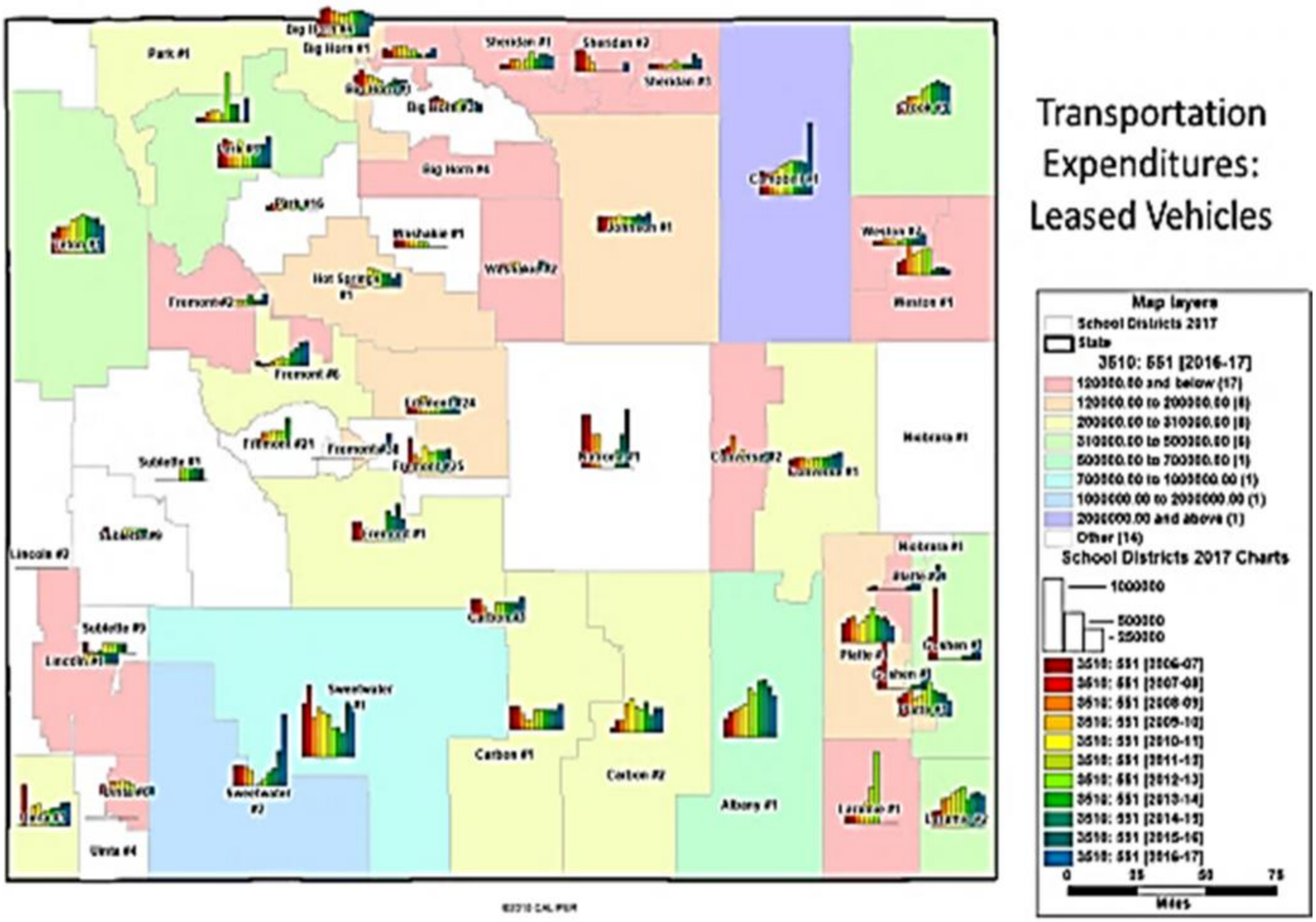


Figure 21: Vehicles



Conclusions from the Financial Analysis

The number of vehicles and the cost per vehicle largely drive costs. The cost per vehicle is controlled by the cost of the vehicle and the cost of the driver including salary and benefits. To a lesser extent, costs are also driven by the number of miles, which affects fuel and supplies, such as tires and lubricants. Wide variation exists in cost increases by district. Statewide, the cost increases exceed the consumer price Increase. Capital costs have increased more than other cost components. Despite the fact that components of the reimbursement formula control the number of vehicles, the costs of capital outlay have increased by 123 percent because the number of vehicles has increased.

Operating Data Analysis

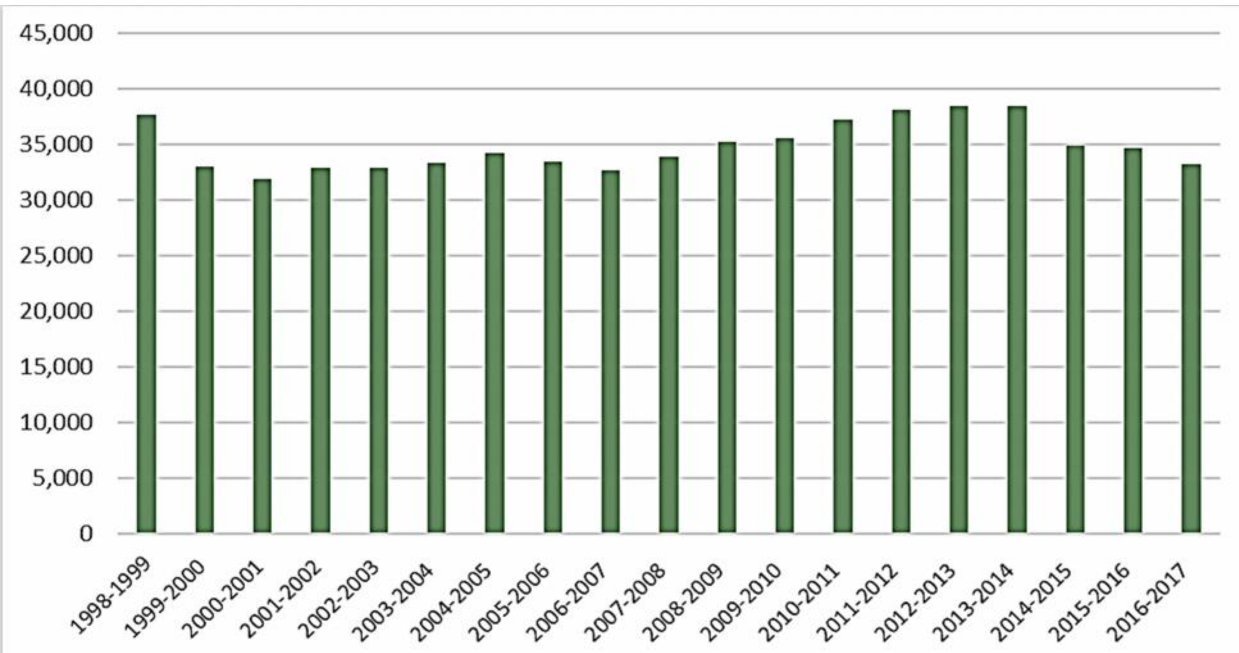
The operating data analysis reviews trends in students transported, types of miles driven, and types of vehicles used.

Students Transported

Trends in the number of students transported

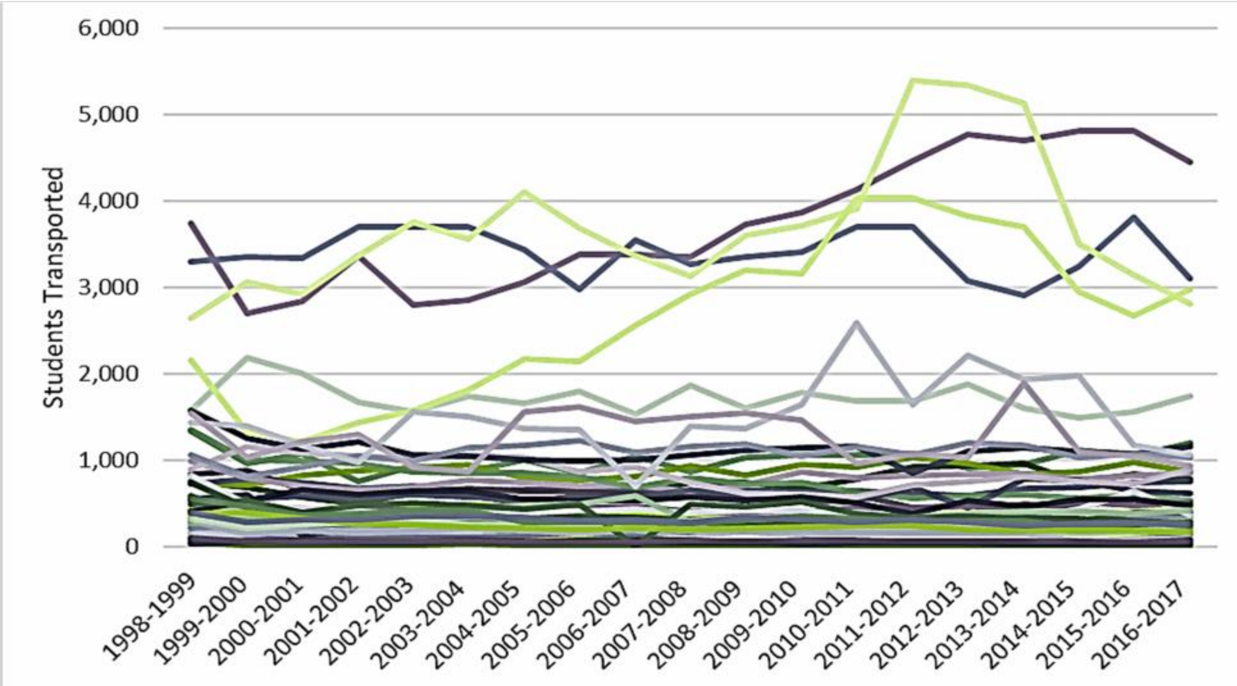
The number of students transported has fluctuated by more than 5,000 students, with rapid declines twice during the period from 1999-2000 to 2016-17. Wyoming experienced an increase in student enrollment of 8,424 during the past decade, followed by a decrease of 741 students in the most recent year. This results from changing enrollment due to demographic and economic factors. Other factors may also contribute to the increase in students transported, including housing developments placing more students outside the walking zones or more roadways being declared hazardous, therefore making students closer to school eligible to ride. School closures and school-level consolidation may also mean more students ride buses. Figure 22 presents the statewide trends in the number of students transported.

Figure 22. Students Transported, Statewide Trends



The line graph in Figure 23 shows the fluctuation for each school district.

Figure 23. Students Transported, District Trends

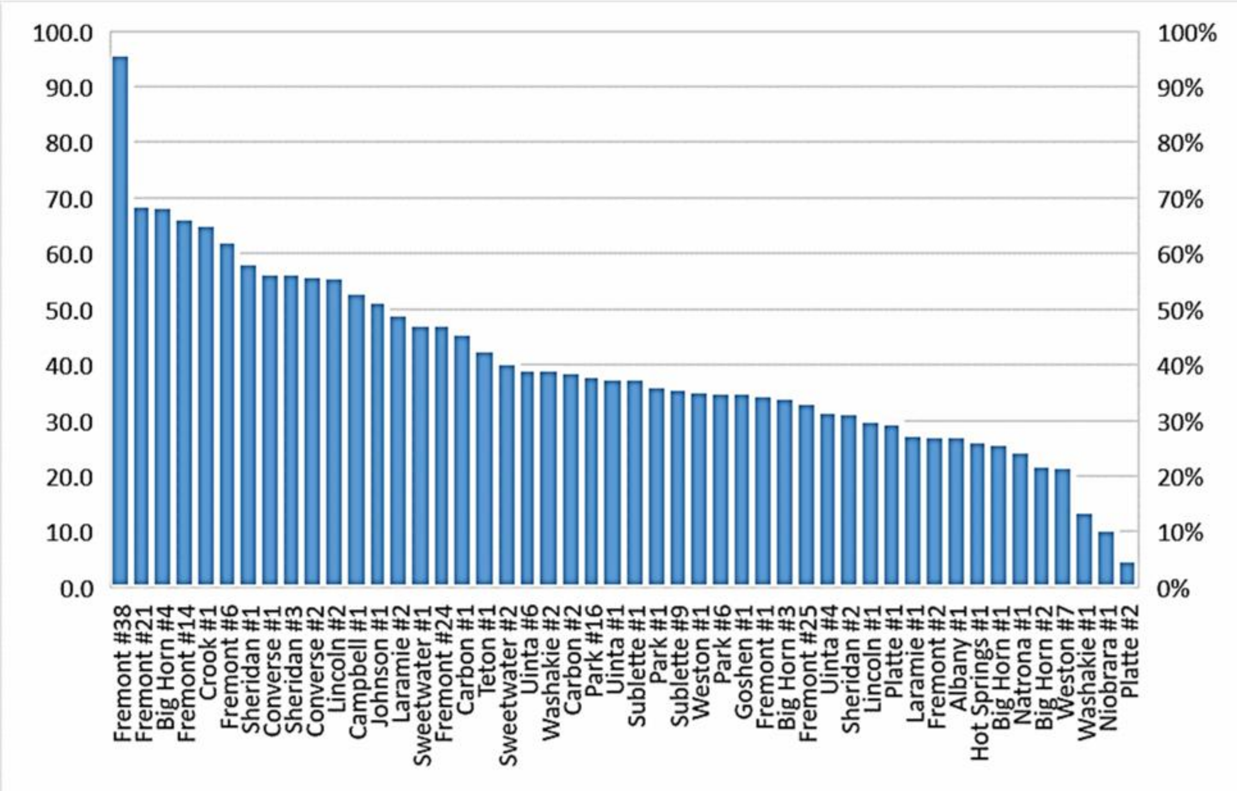


Percentage of students transported

Students transported as a percent of total enrollment differs by school district from less than 10 percent to more than 90 percent. The state transportation reimbursement formula will not reimburse for students transported within walking zones, defined as one mile from the school for elementary students, 1.5 miles for junior high students, and two miles for high school students. The number of students transported as a percentage of total enrollment changes significantly in some districts from year to year.

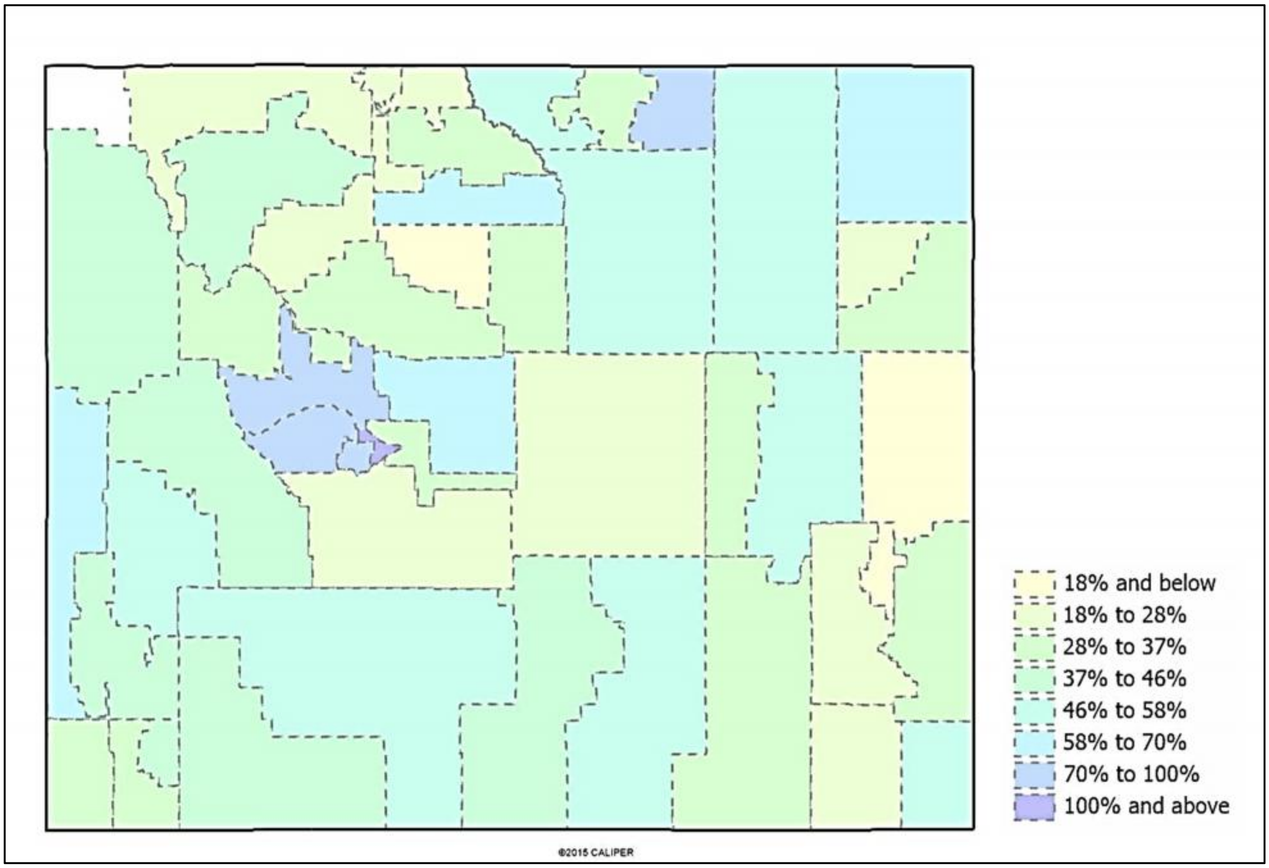
Figure 24 below indicates that the median percentage is below 40 percent.

Figure 24. Percentage of Students Transported by District



The variation in percentage of students transported ranges widely across the state due to geography and population patterns, as shown in Figure 25**.**

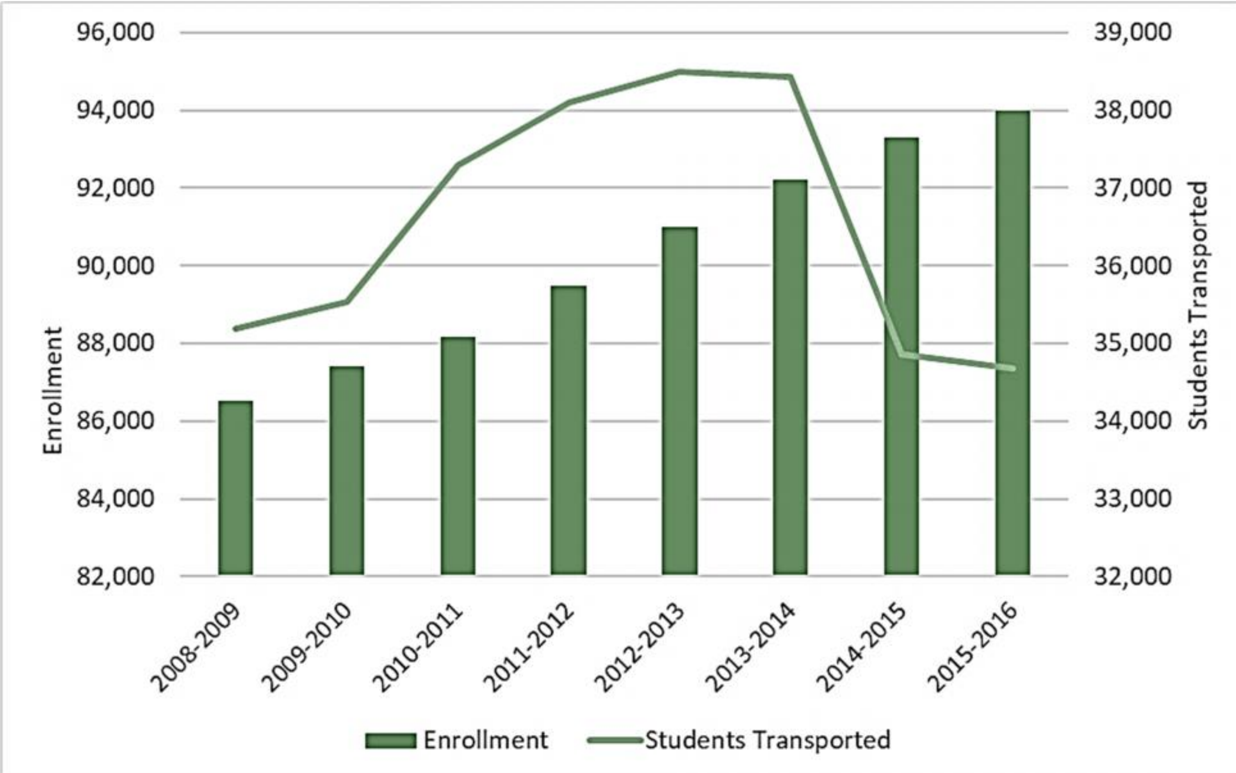
Figure 25. Map of Percentage of Enrollment Transported, 2016-17



Enrollment and Students Transported

From 2008-09 to 2013-14, the number of students transported increased more rapidly than total enrollment, but that reversed in 2014-15, as shown in Figure 26. Several reasons may account for this. New schools may have been built away from population centers, which causes more students to ride who previously walked to the former school. Walking zone limits may have been reduced due to determinations that walking routes were hazardous. Walking zone limits may not be enforced by the school district, which results in decreased funding.

Figure 26. Enrollment and Students Transported



Students Per Vehicle and Percentage of Students Transported

Several funding implications relate to the percentage of enrollment transported. Figure 27 below, shows that since 2013-14 both the percent of students transported and the number of students per vehicle have decreased significantly. The reasons should be justified by the district and evaluated by WDE. The walking zones and determinations of hazardous walking areas should be reviewed carefully. In the past, federal grant funding has been available to improve safe walking routes.

Students Transported per Vehicle

The number of students transported per vehicle is an indicator of routing efficiency, particularly in the use of multiple routes rather than just a single route for a bus. Figure 28 indicates wide variation in students per vehicle. The reimbursement regulations promote multiple routes, which require staggered bell times for schools and sophisticated routing. All Wyoming school districts are well below national benchmarks of approximately 100 students per vehicle. This benchmark is due to running multiple routes. For example, if a bus in the morning takes 50 students to the secondary school and then takes another 50 to the elementary school, it transports 100 students in a day. In sparsely populated areas, this may not work due to travel distances and time, thereby requiring the bus to pick up all students at one time and stop at the secondary school first and the elementary school immediately thereafter.

Figure 27. Students per Vehicle vs Percentage Transported

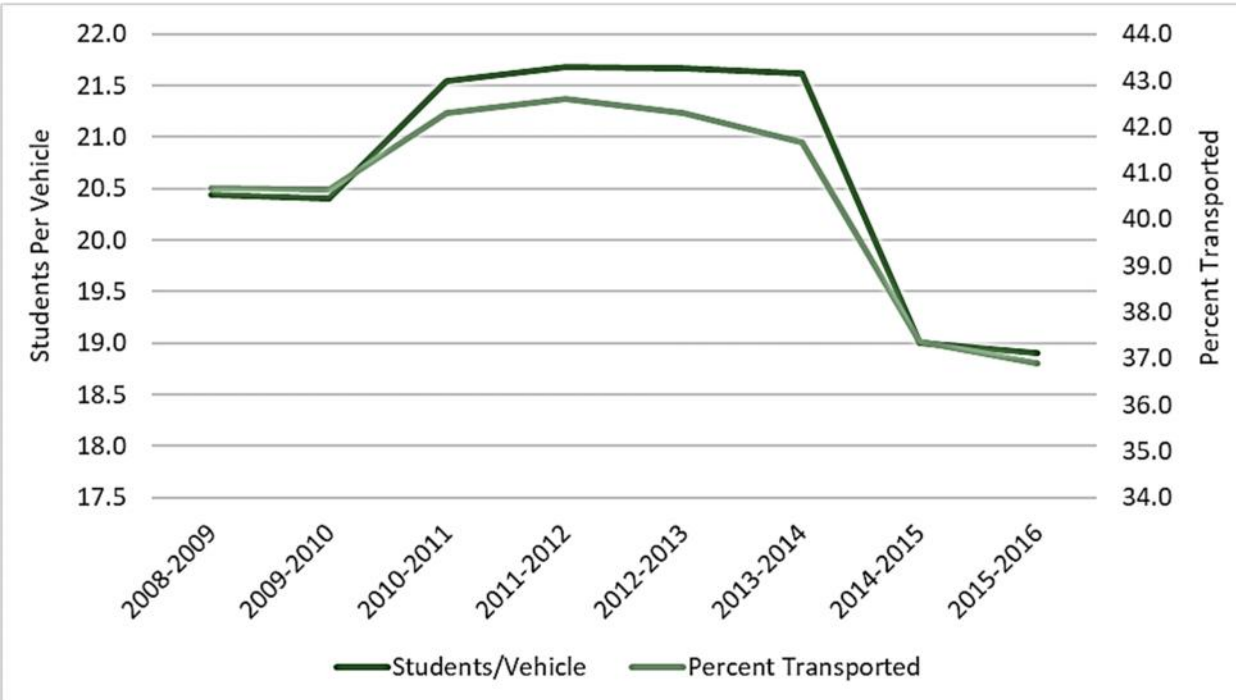
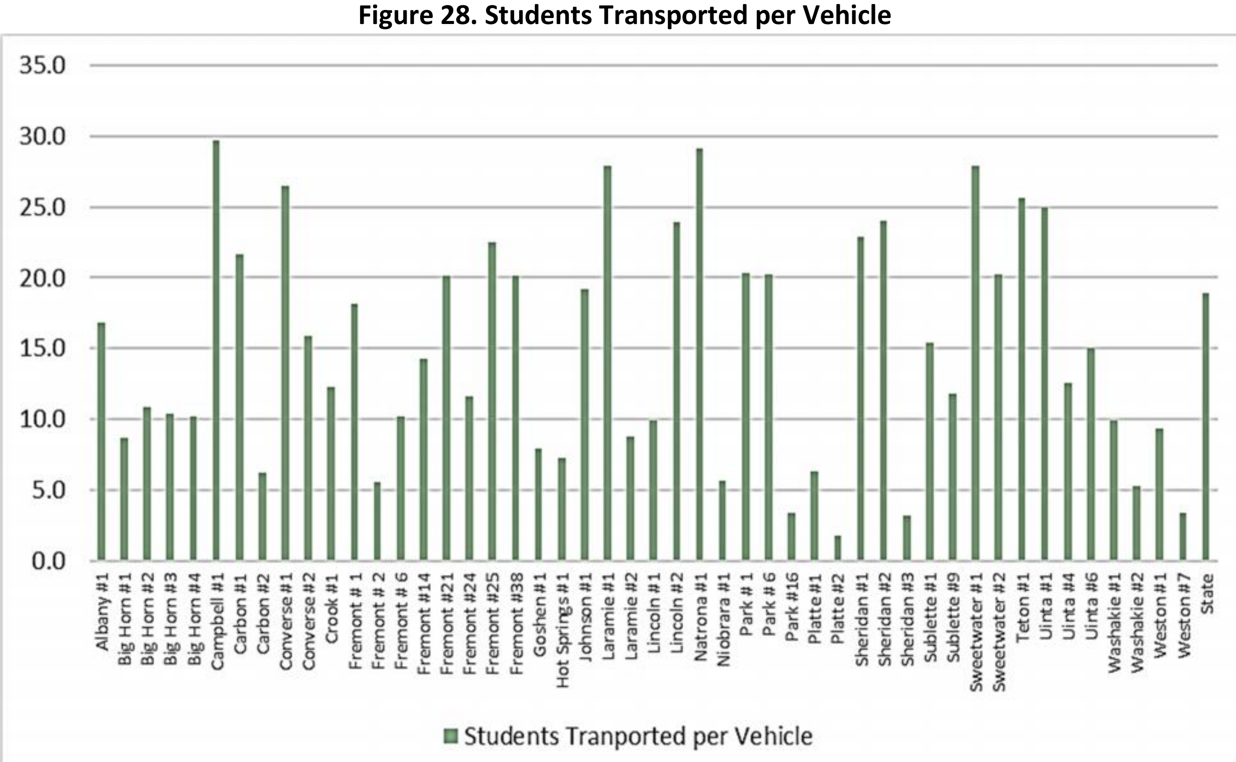
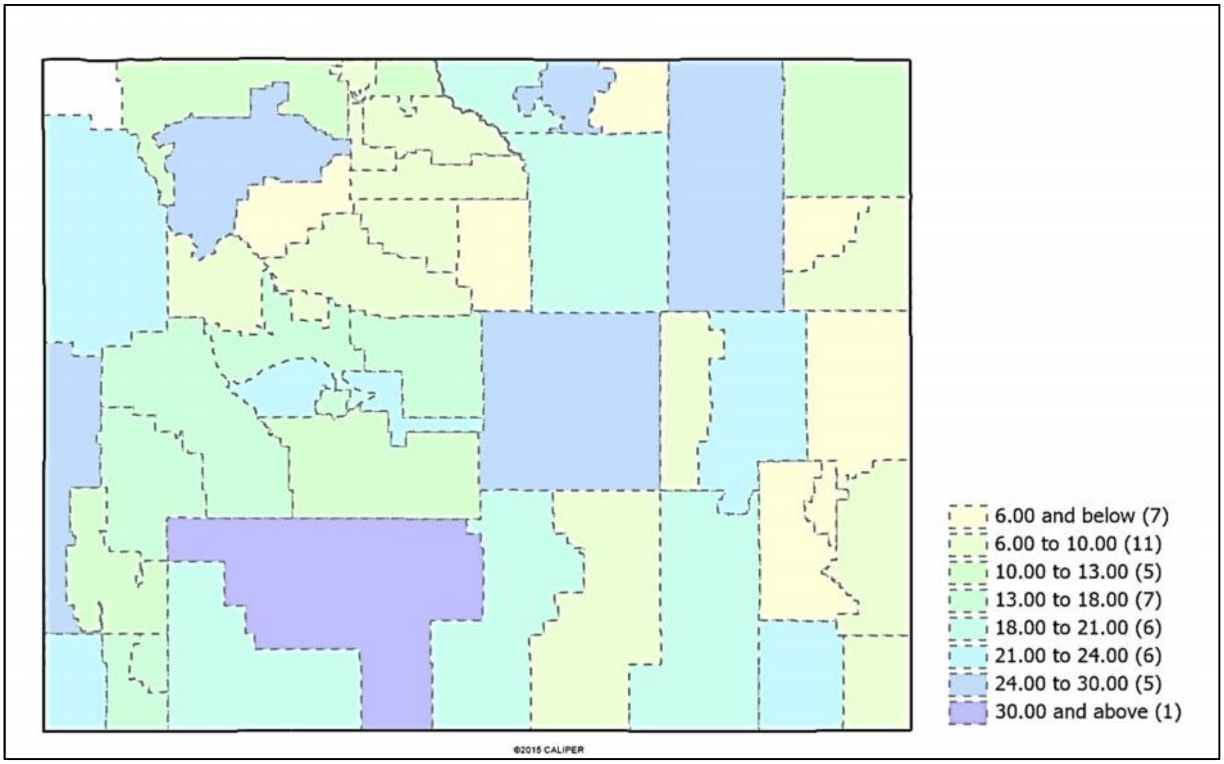


Figure 28. Students Transported per Vehicle



The number of students transported per vehicle is shown by colored shading for all districts in the map in Figure 29. The greater number of students transported per vehicle occurs in areas of population density, as shown by red dots. The districts shown in darker blue shading generally shows a large population center.

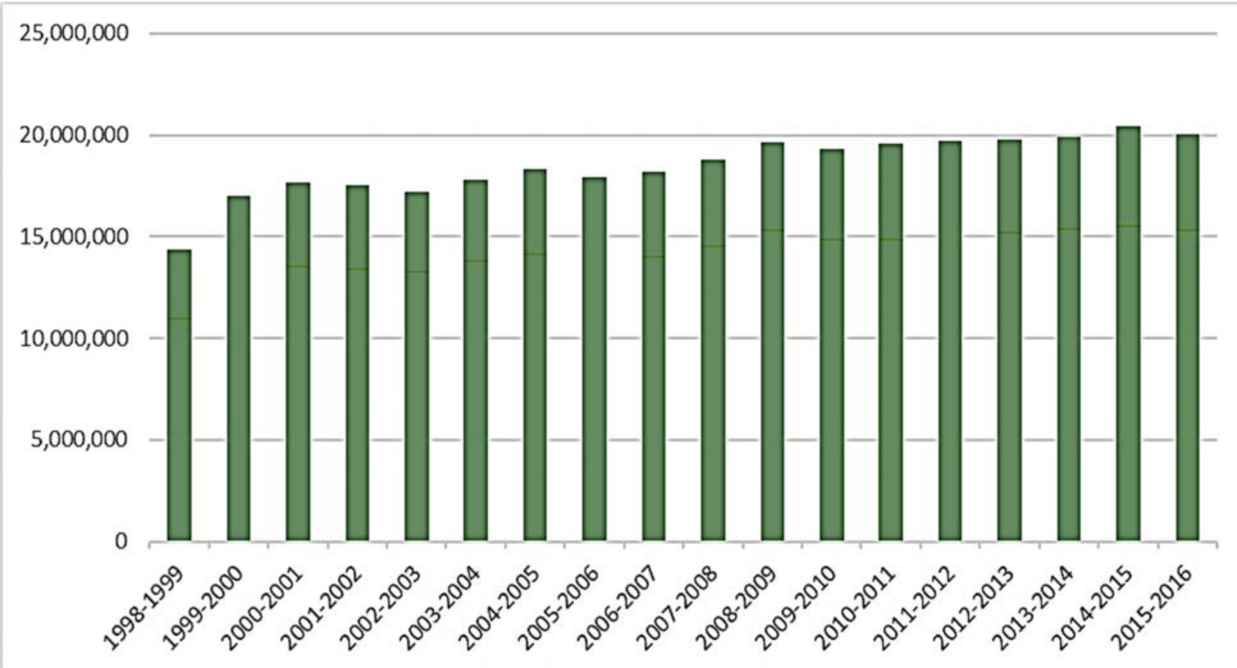
Figure 29. Map of Students Transported per Vehicle, Excluding Multipurpose Vehicles (MPVs), 2015-16



Total Miles Transported

The total fleet miles increased rapidly from 1998-99 to 2008-09 then stabilized with minor fluctuations, as shown in Figure 30. All districts are shown in the stacked bar chart to illustrate that increases or decreases in certain years resulted from changes in a few districts.

Figure 30. Total Fleet Miles



Annual Miles by Type

The transportation funding model reimburses all types of uses: regular route miles, activity miles, field trip miles, summer school miles, other miles, and extra miles. On a statewide basis, route miles to and from school comprise 69.1 percent of total miles. Activity miles comprise 19.5 percent of total miles, while field trips comprise 6.6 percent of total miles. For activity miles, reimbursement is limited to miles within Wyoming and requires justification for mileage up to 150 miles outside the state.

Figure 31. Annual Miles by Type, Statewide (2016-17)

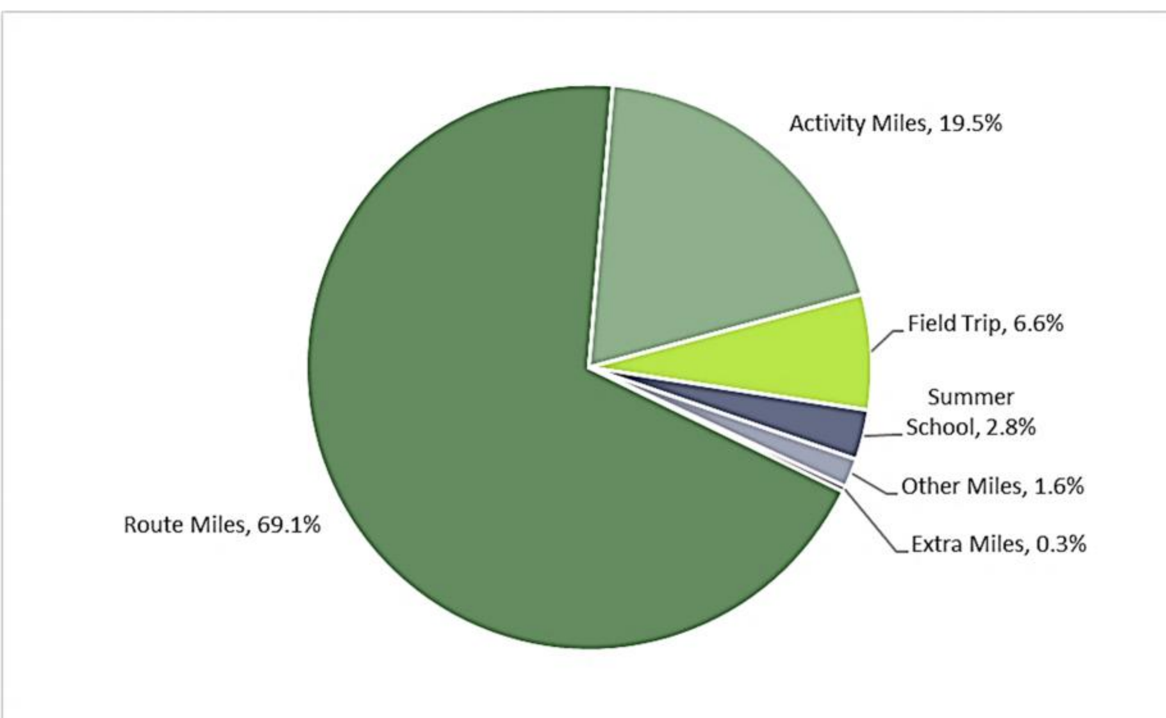
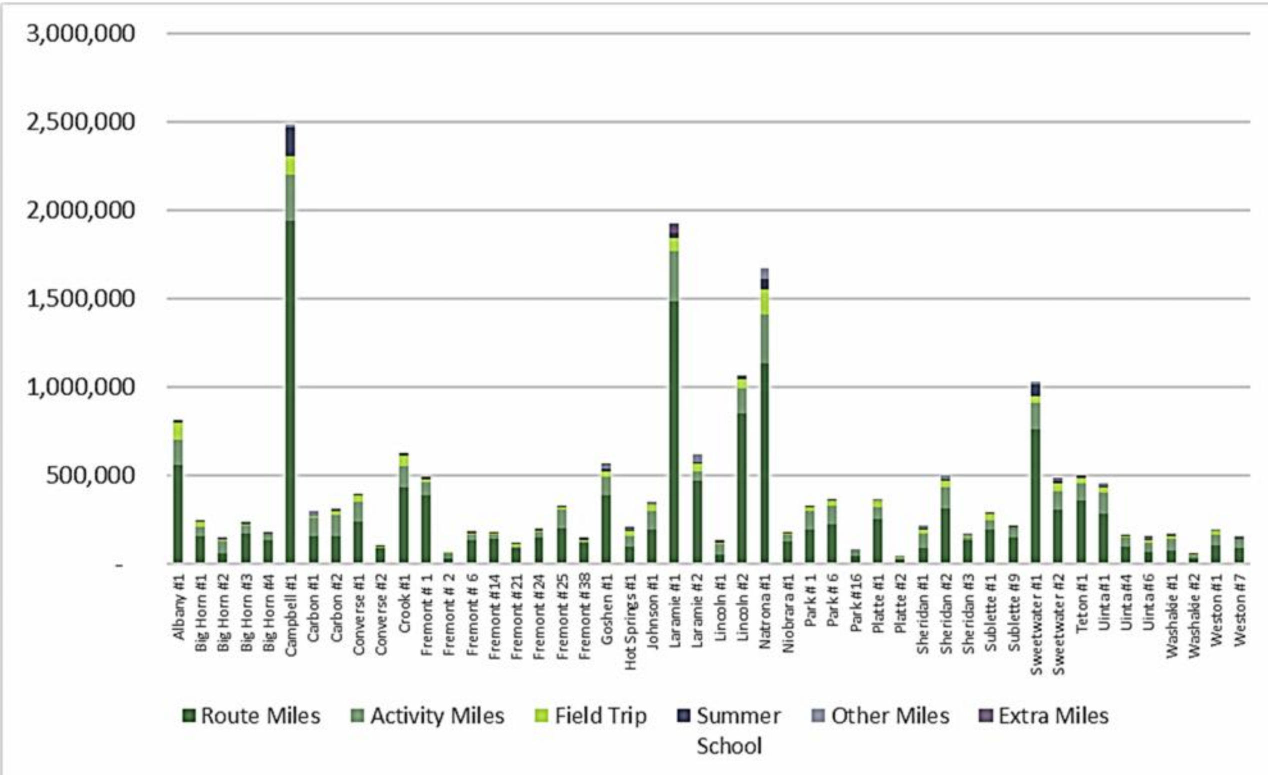


Figure 32 shows that five large districts have more annual miles than all other districts combined. In most cases, the percentage of each type of mileage is relatively consistent. In several cases, the percentage of field trip miles is higher than the average.

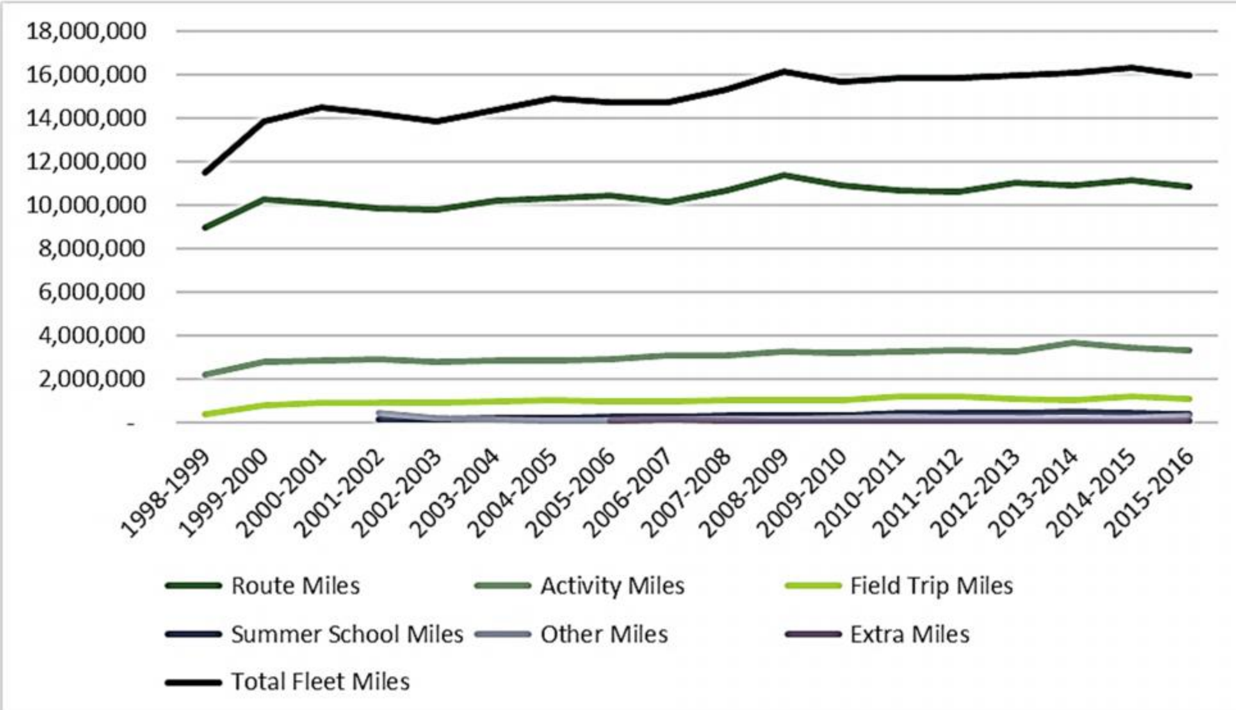
Figure 32. Annual Miles by Type by District (2016-17)



Trends in Types of Miles

The changes in types of miles result from changing programs in extracurricular activities, field trips, and summer school. Figure 33 shows the trend in miles by type of transportation over time.

Figure 33. Trends in Types of Miles, 1998-99 to 2015-16



In summary, the dollar and percentage increase in miles from 2001-02 to 2015-16 is shown in Table 3.

Table 3
Increase in Type of Miles, 2001-02 to 2015-16

	Route Miles	Activity Miles	Field Trip Miles	Summer School Miles	Other Miles	Total Fleet Miles
Increase, Miles	987,310	377,466	174,616	250,451	(47,810)	1,741,943
Increase, Percentage	10%	13%	20%	194%	(26%)	12%

Daily Miles per Student Transported

The average miles that students are transported is related to the geographic distribution of students within a school district as well as the routing efficiency. This is shown on the map in Figure 34 below to help understand the geographical reasons for mileage driven and on Figure 35 to show the variation by district. In a district with low enrollment, a long route can also affect the average daily miles for a few special education students. The average miles that students are transported is also related to the efficiency of the route driven. An efficient route transports as many riders as possible along the shortest route in terms of time and miles.

Figure 34. Daily Miles per Student Transported, 2016-17

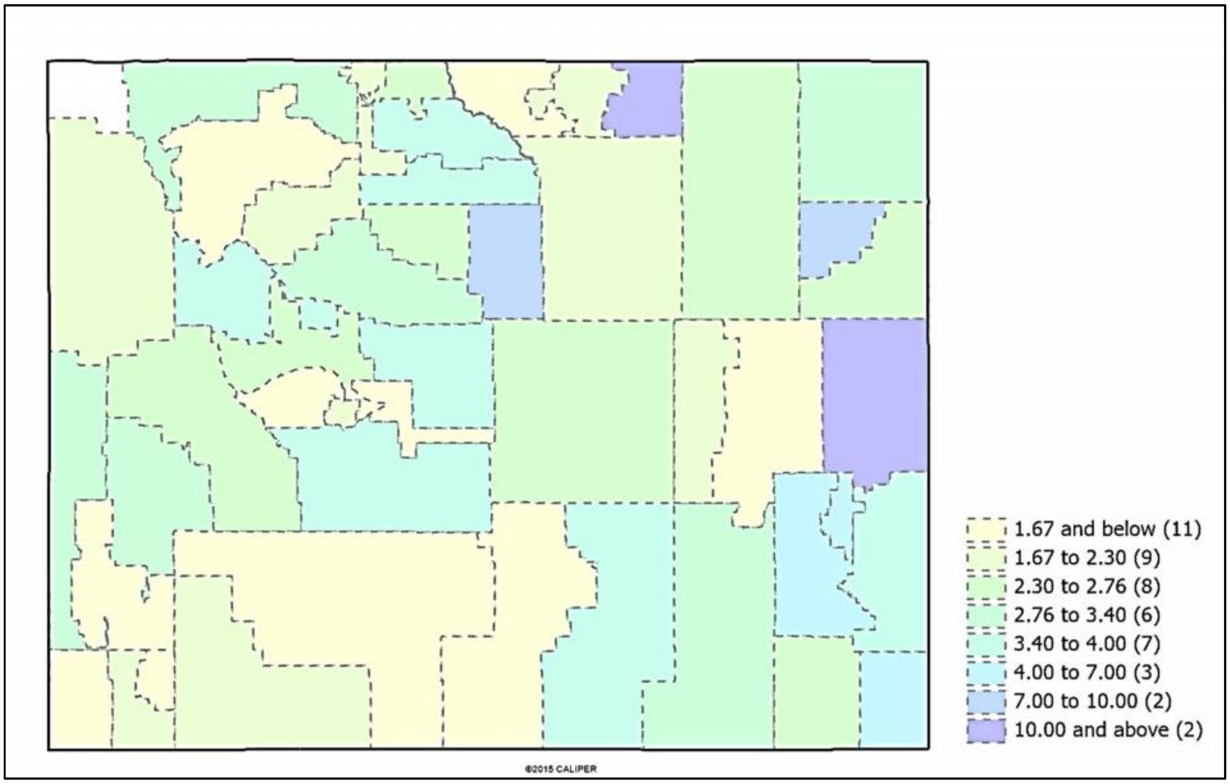
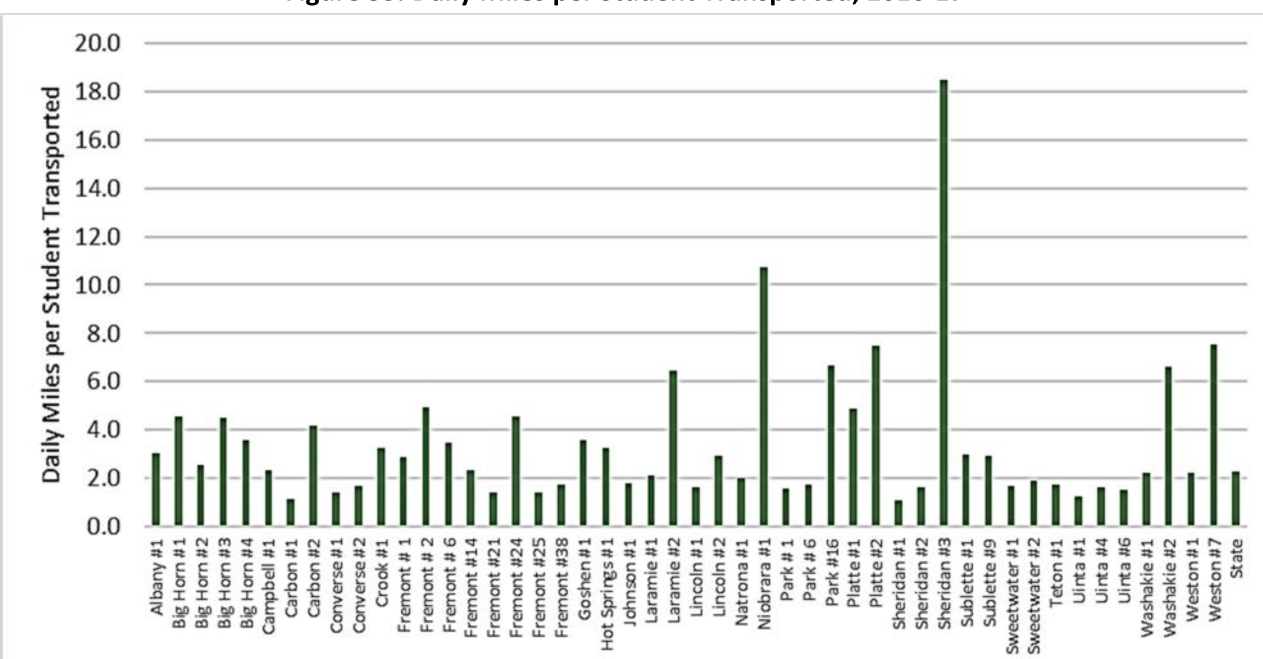
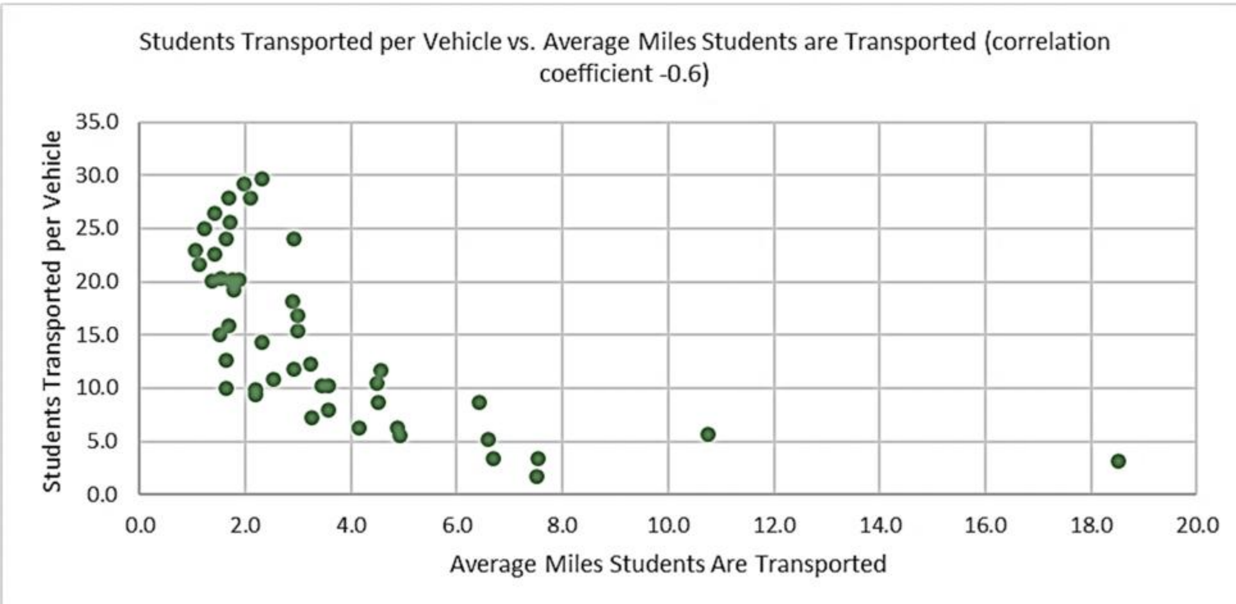


Figure 35. Daily Miles per Student Transported, 2016-17



The relationship between the number of students transported per vehicle and the average miles students are transported is shown in Figure 36. It indicates a clear pattern of longer travel distances restricting the number of students that can ride in a vehicle. Schools using multiple routes per bus can transport more students per vehicle. Multiple routes per bus require school systems to stagger the school bell times (start and end of day) between elementary and secondary schools. In larger systems with higher population densities, staggered bell times will allow a bus to serve the high school, then the junior high school, and finally the elementary schools or three routes each morning and afternoon. In a smaller school system with all grade levels at one school or on one campus, multiple routes may not be practical.

Figure 36. Students Transported per Vehicle vs. Average Miles Students are Transported



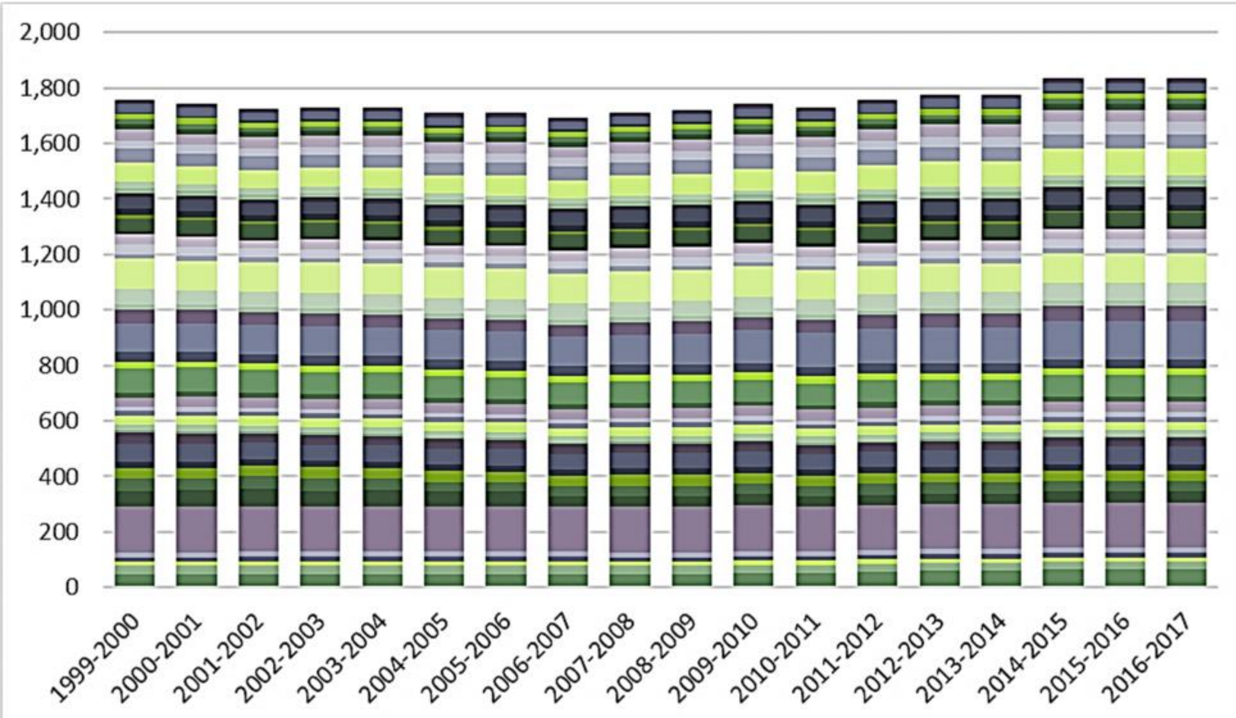
Conclusions on Miles

Daily miles vary widely by district. Students transported per vehicle is closely related to the average miles students are transported. The increase in activity miles, field trip miles, and summer school miles is nearly equal to the increase in total fleet miles.

Vehicles

Transportation regulations froze the number of vehicles at 1999 levels, requiring justification for additional vehicles. Figure 37 indicates that the number of vehicles declined from 1999-2000 and then increased steadily to 2016 to 2017. Replacements are approved on a one-to-one replacement unless enrollments have declined more than 15 percent, which then requires additional justification. To add buses, the funding regulations require an evaluation of whether buses are used for multiple routes daily.

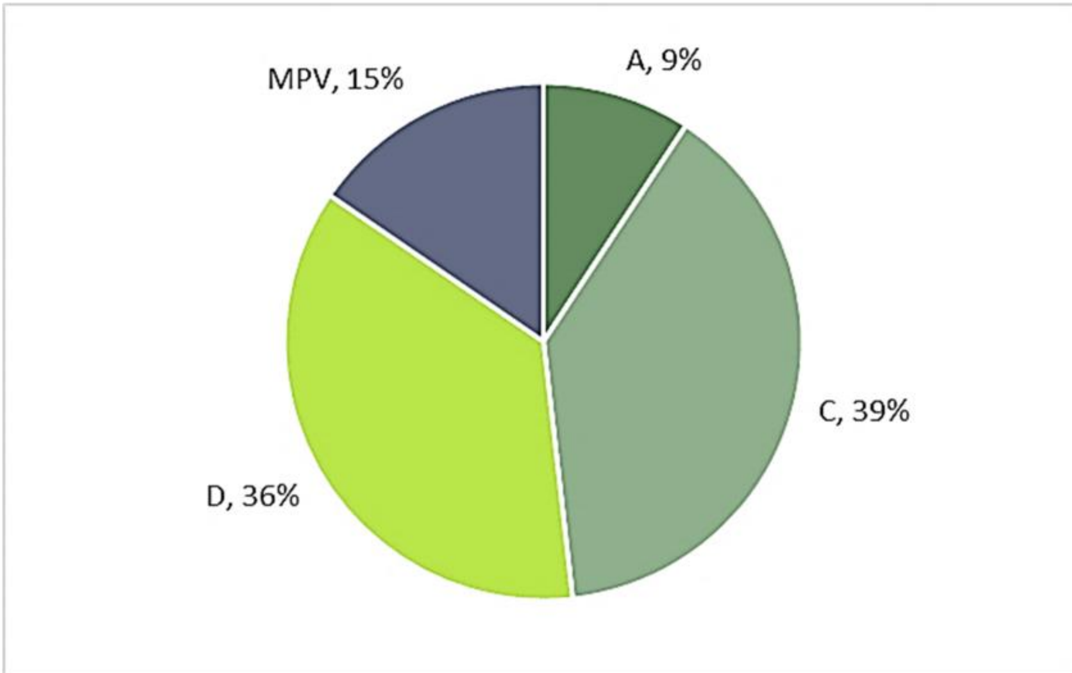
Figure 37. Vehicles by District



Vehicle Types

Wyoming regulations define five types of vehicles. Four types (A, B, C, D) are typical yellow school buses with capacities ranging as high as 90 passengers. A multi-purpose vehicle (MPV) is used by both students and staff and prorated costs are only reimbursed for student use. Vehicle replacement is funded fully if a district selects the low bid vehicle. Vehicle replacement is subject to several restrictions regarding vehicle age and other factors. Vehicle types and the change in numbers over time are shown in Figure 38.

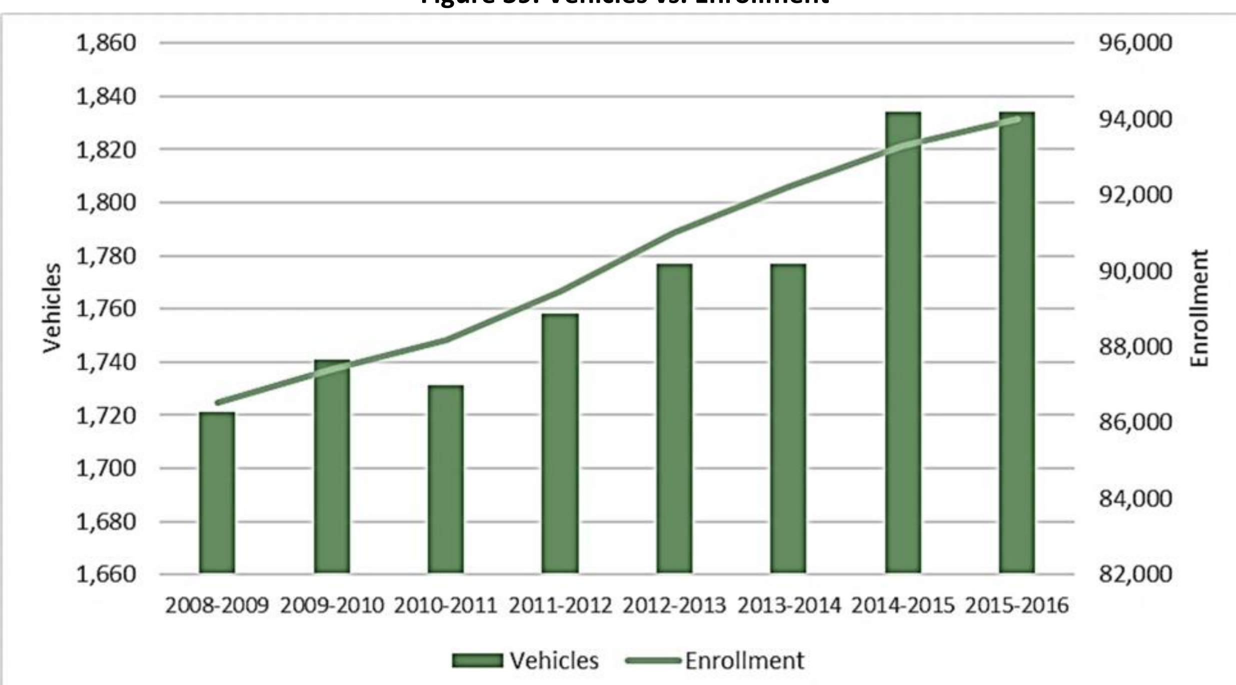
Figure 38. Vehicle Types, State Percentage (2016-17)



Vehicles and Enrollment

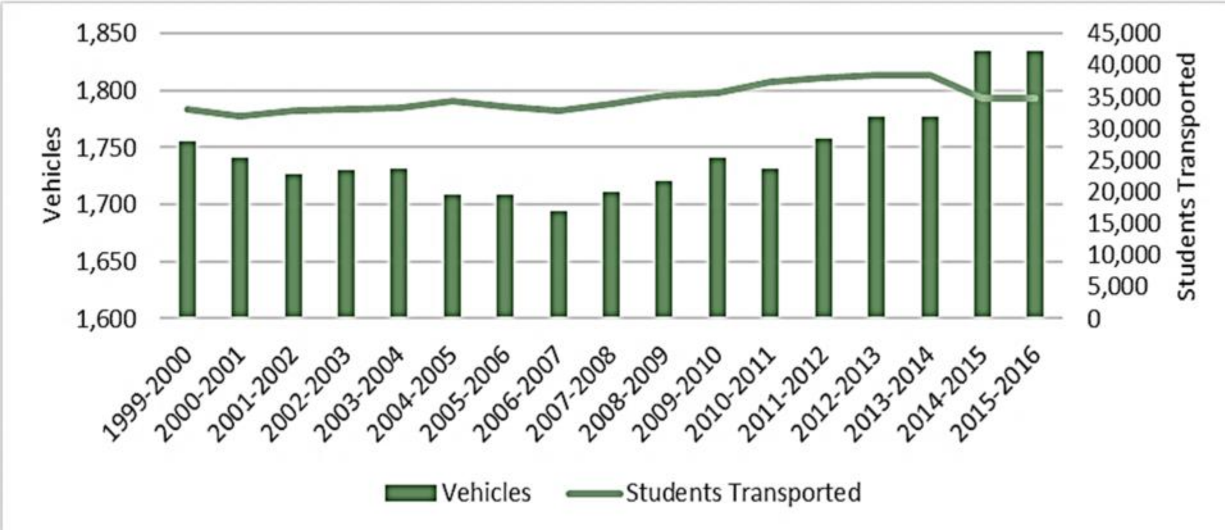
The number of vehicles is increasing with total enrollment. Although this seems reasonable, the number of vehicles should be closely related to the number of students transported rather than total enrollment. Figures 39 and 40 compare the trends.

Figure 39. Vehicles vs. Enrollment



Since 2006-07, the number of vehicles has increased more rapidly than the numbers of students transported. This is an expensive trend because each vehicle adds a driver's salary and benefits.

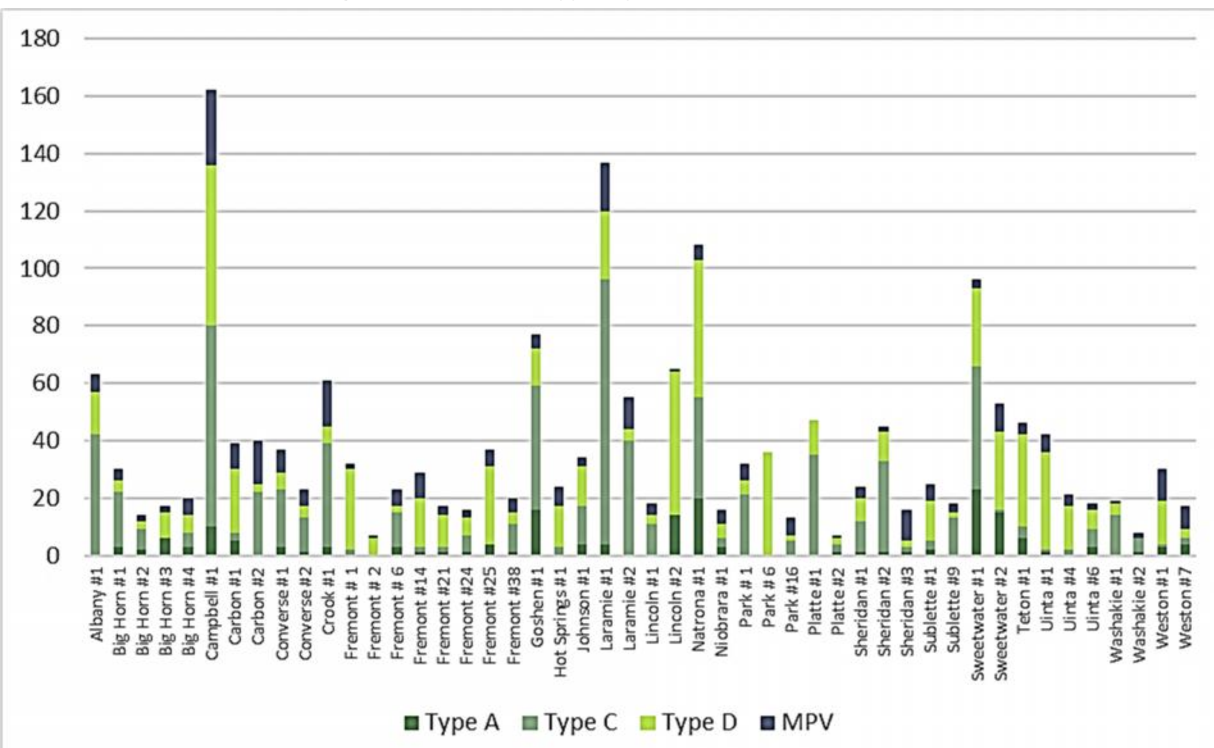
Figure 40. Vehicles vs. Students Transported



Vehicle Type by School District

The mix of vehicle types and capacities should be managed to reduce total cost. Figure 41 indicates some school districts have a larger proportion of Type A small vehicles.

Figure 41. Vehicle Type by School District, 2015-16



Conclusions from Operating Comparisons

Regulations and policy decisions at the state and district level affect costs. Vehicles are increasing consistent with total enrollment but outpacing students transported. The number of vehicles needed is affected by the increase in activity miles because the activity buses are needed at the same time as the route buses taking students home from school.

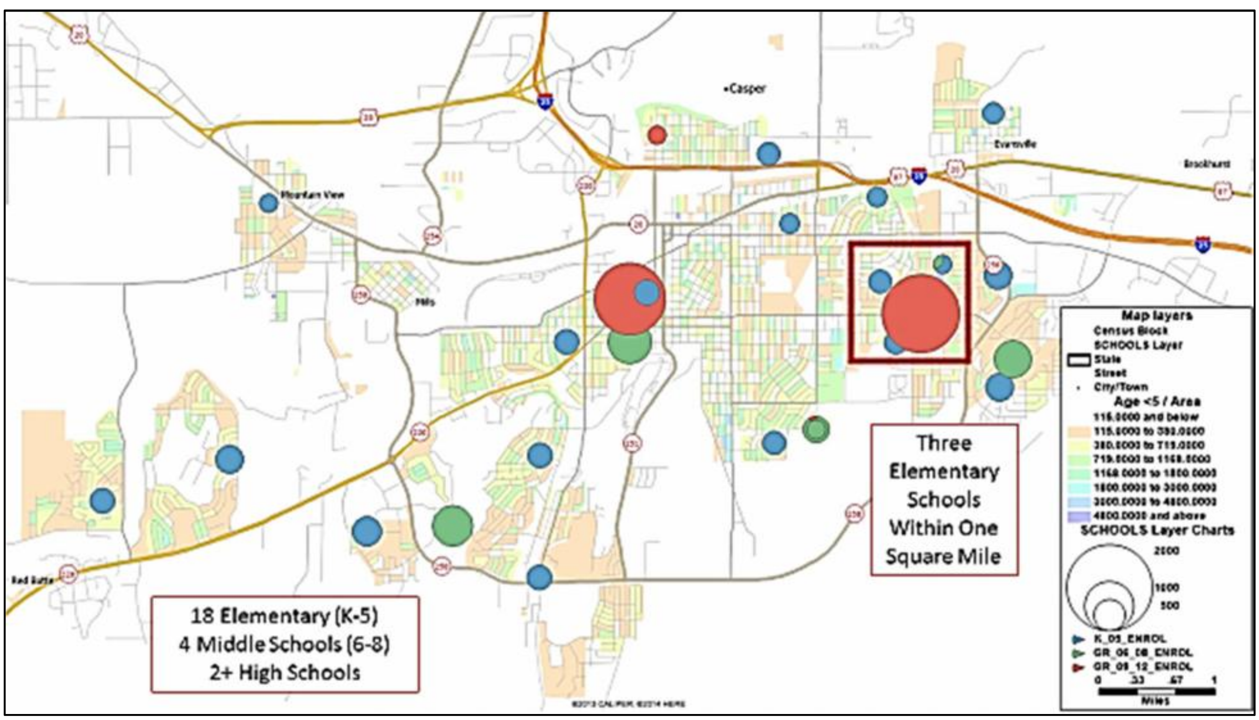
Examples of District Requirements and Operations

Transportation in Urban and Suburban School Districts

Transportation systems in urban and suburban areas can be less costly due to the ability to carry more students in a reasonable travel time and to more fully utilize the seating capacity. In addition, larger numbers of students can walk to school. The funding formula restricts reimbursement if students are bussed within walking areas, defined by the regulation as one mile for elementary students, 1.5 miles for middle school students, and two miles for high school students.

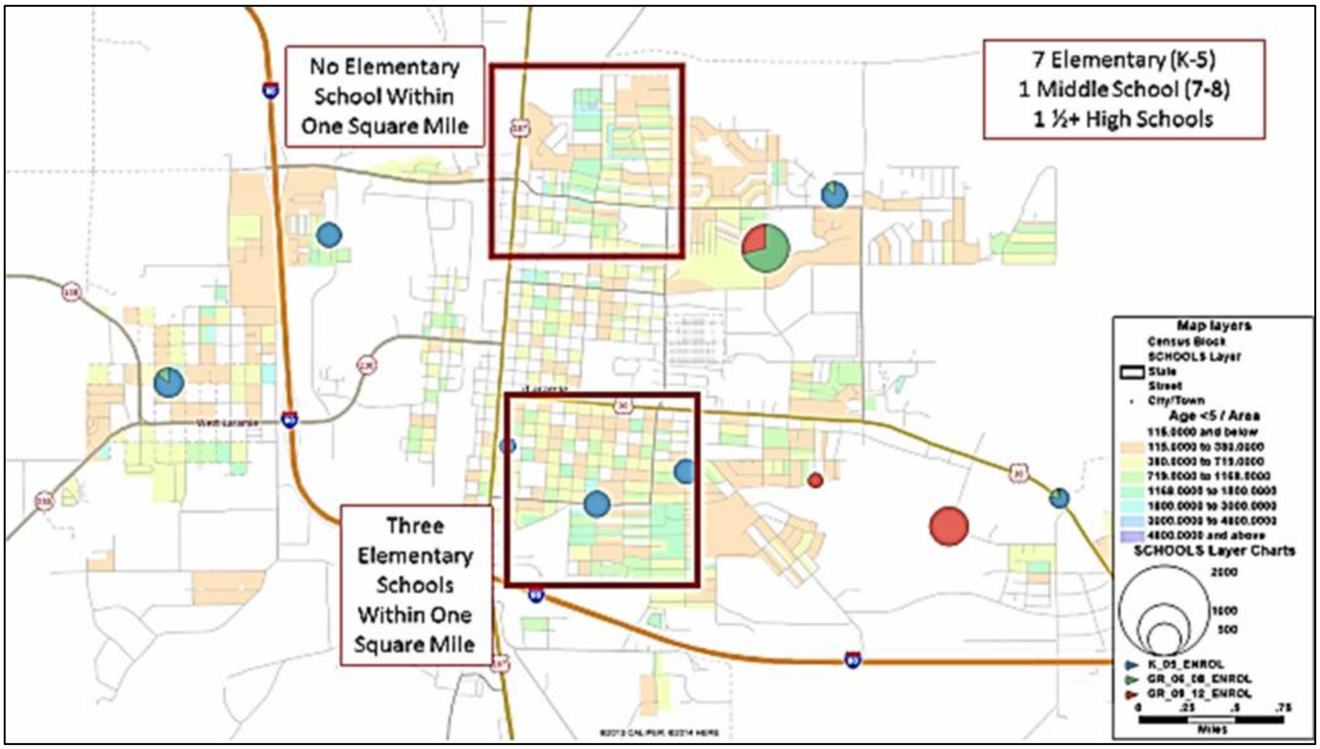
Figures 42 and 43 below locate the number of schools with different colored dots for grade levels served, showing school enrollments by dot size, and showing the number of young children by shading at the census block level. Blue dots represent elementary schools, green dots are middle schools, and red dots are high schools. A square is used to show one square mile, the elementary walking distance required by the funding formula.

Figure 42. Urban and Suburban District Requirements



Multiple routes for each bus (a high school run, followed by a middle school run, followed by an elementary school run) are possible in the denser residential areas of urban and suburban school districts. Each school district has unique transportation requirements due to geography, land development patterns, school-site selection, grade-level configurations, and other factors. Contrasting these two urban school systems shows some areas with multiple elementary schools within a square mile. The districts have different grade-level configurations (sixth through eighth grades in one, and seventh and eighth grades in the other) and different feeder patterns. Four middle schools feed the high school in one district, while only one feeds the high school in the other district. These school enrollment sizes and feeder patterns affect bus routing and the number of buses that can serve multiple routes/tiers.

Figure 43. Urban and Suburban District Requirements



Transportation in Rural School Districts

Transportation in rural school districts can be more costly due to longer ride times restricting the ability to fill the seating capacity. This requires more buses and drivers with salaries and benefits as well as more fuel. Figure 44 below shows travel time from the center of Pinedale in different shades for five-minute increments up to 30 minutes. The map also illustrates the location of schools in a selected rural area.

Figure 44. Rural District Requirements

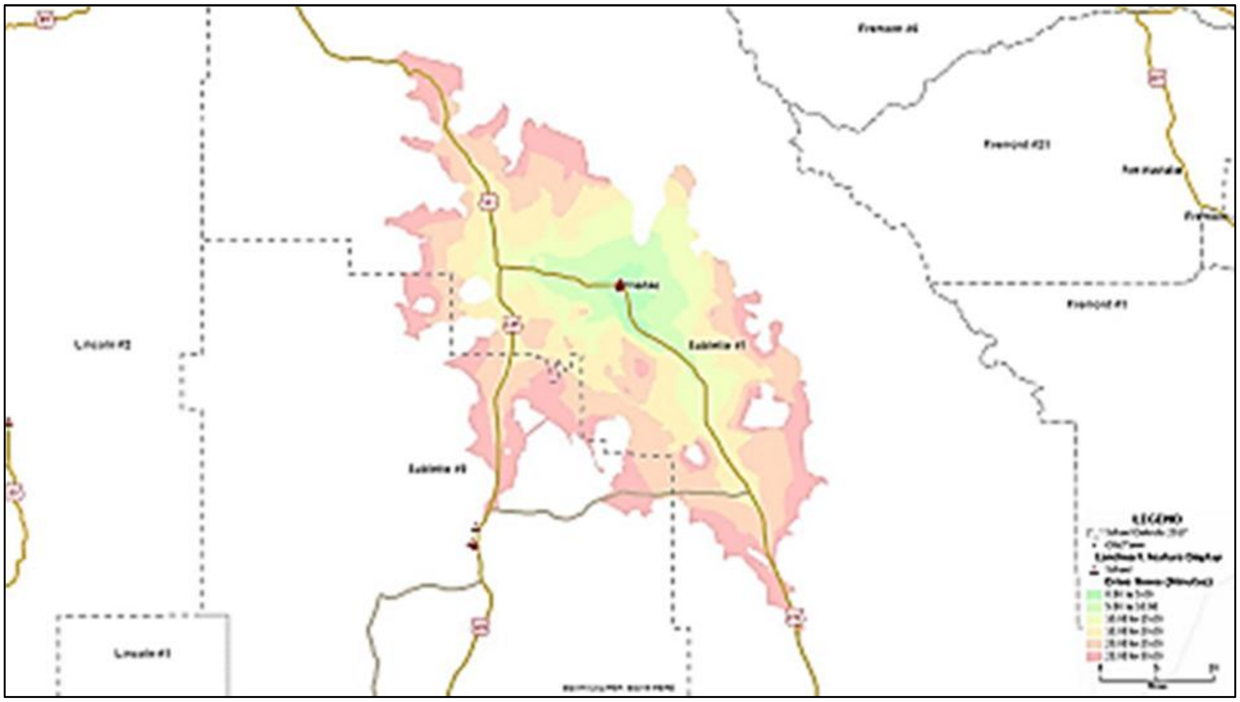
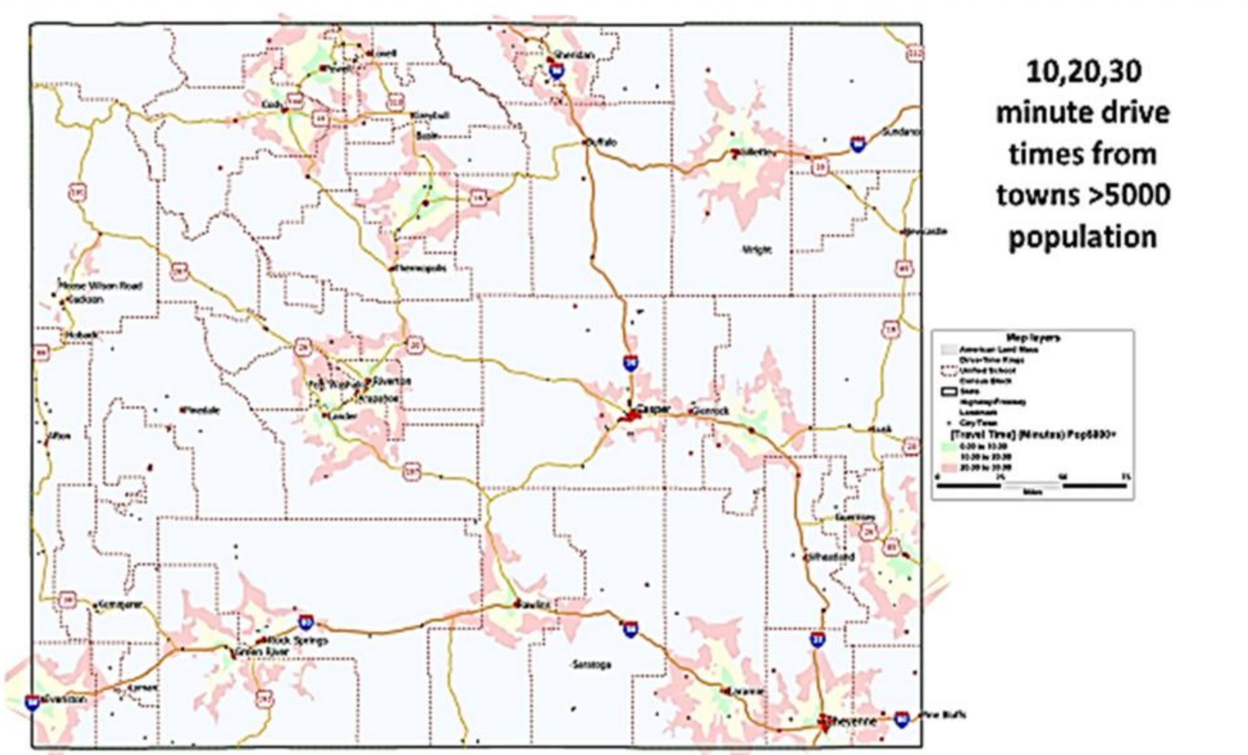


Figure 45 map below shows the drive times in ten-minute increments for the entire state. These two maps illustrate the very different circumstances school districts face in transporting their students in Wyoming.

Figure 45. Travel Times from Towns with Populations over 5,000



iV. Transportation Funding Recommendations

School transportation is a complex system of interrelated components. A cost-effective transportation system must deliver students to and from school on time and safely. Each school district faces individual circumstances based on the total number of students transported, the number of school buildings, the geography, and the location of school buildings. Promoting efficiency requires an understanding of the relationships among the components. From a statewide perspective, the efficiency incentives should concentrate in the areas of greatest cost or greatest cost increase.

Providing efficiency incentives requires technical assistance to ensure that decision makers at the district level understand their transportation system, the opportunities for efficiency, and the implementation challenges. Modern technology can assist in routing the buses efficiently and maintaining transportation management information. This may require technical assistance and funding of demonstration projects as well as pilot programs.

Two approaches are discussed in these recommendations. The first broad option is to refine the current system in ways that enforce current components, address specific issues, and add incentives to improve efficiency through adoption of best practices. The second option is to develop a funding formula based on student population density, either linear or area density, and vary funding levels within groups, such as a low, medium, and high density. The broad options have various advantages and disadvantages. A transition from one to the other during the five-year period is possible, which would allow best practices to be developed and implemented before funding levels for each density group are set. This would avoid setting funding levels on current practice rather than best practice. The transition period would allow time to provide technical assistance to pilot districts in each density group and establish best practices. It would also provide time to inform districts of how they compare to others in their density group or the state as a whole, allow them to learn from the pilot districts, and implement best practices. Transportation efficiency improvement plans are multi-year programs.

A number of other states use density factors in funding of school transportation. Area density is calculated by dividing the number of transported students by the square mile area of the district. Linear density is calculated by dividing the number of students transported by the bus route miles.

Refining the Current Transportation Funding System

Enforce Reimbursement Restrictions

The existing regulations contain provisions that control reimbursement levels and costs. These regulations must be enforced systematically.

Walking Zones

Regulations establish walking zones and provide no reimbursement for students transported within walking zones unless a hazardous condition exists. By regulation, the hazardous designation must be reconfirmed each year. The methods of evaluating hazards and reconfirming hazards annually should be reviewed. In addition, the methods of restricting reimbursement payments for transportation within a walking zone should be reviewed.

In some cases, a minor investment could eliminate the hazard thereby reducing reimbursement over the long term. For example, installation of a sidewalk or employment of a part-time crossing guard may eliminate the need for another bus. A decision-making method should be established to review these opportunities. In the past, federal grant funding has funded these improvements.

Sharing Routes Between School Districts

State regulations restrict the sharing of transportation services between school districts. In limited situations, a bus from one district drives through an adjacent district to deliver students to an out-of-district school or for other reasons. To reduce costs, these options should be allowed.

Parent Contracts

Parent contracts can be used selectively to reduce the number of buses or excessive travel times and distances.

Capital Investment

The number of buses also governs the cost of driver wages and benefits. Therefore, using buses efficiently controls more than 60 percent of the cost of transportation, meaning that decisions to add buses are very critical in controlling reimbursement and cost. The regulations require justification for adding additional buses beyond the number used in 1999 and require review of bus numbers if enrollments decline more than 15 percent in three years. The justification and review methods should be enhanced to consider best practices in routing efficiency. Efficiency factors will be discussed in the next section.

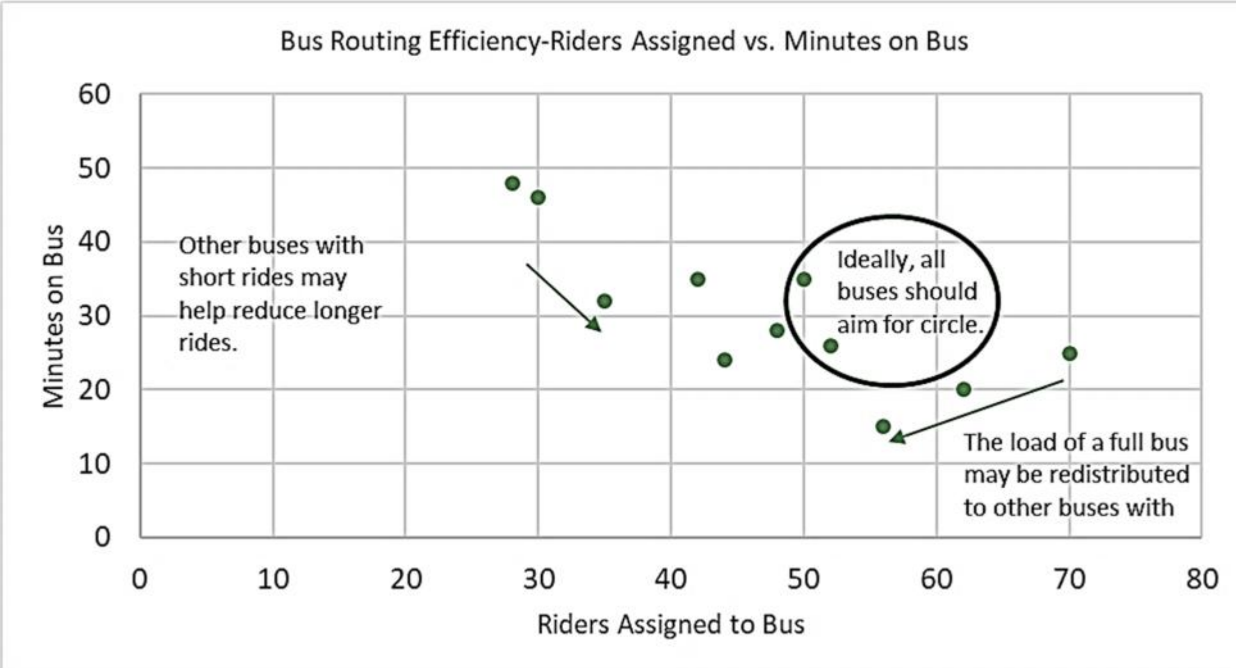
Redefining Allowable Costs

Some atypical costs are reimbursed, including loading zone assistants and bus aides. Constant pressures exist from parents and school employees for addition of optional and expensive services. If fully reimbursed by the state, little reason exists for school administrators to deny requests for these optional services or look at less expensive options.

Promoting Efficiency in Utilization of Bus Capacity

The first step in determining the number of buses required involves determining how many buses are needed at each school. Dividing the number of riders by the bus capacity provides initial information, but it is also necessary to determine how many minutes are required for each bus to pick up its load. In the sample shown on the scattergram shown in Figure 46 below, 15 buses are plotted showing the number of minutes on the vertical axis and the number of riders on the horizontal axis. Three or four buses have runs under 28 minutes and have less than full loads. This raises the question of whether one or more of those runs can be eliminated. Ideally, all buses would have runs varying by ten minutes or less and be close to full capacity. As shown on the scattergram, ideally all buses would be within the rectangle. Efficient routing optimizes the use of both seating capacity and the time available. Time constraints can be set be school board policy governing maximum ride times or by bell times of schools.

Figure 46. Travel Time vs Students Transported



Assigning Bus Runs to Routes – Multiple Routes

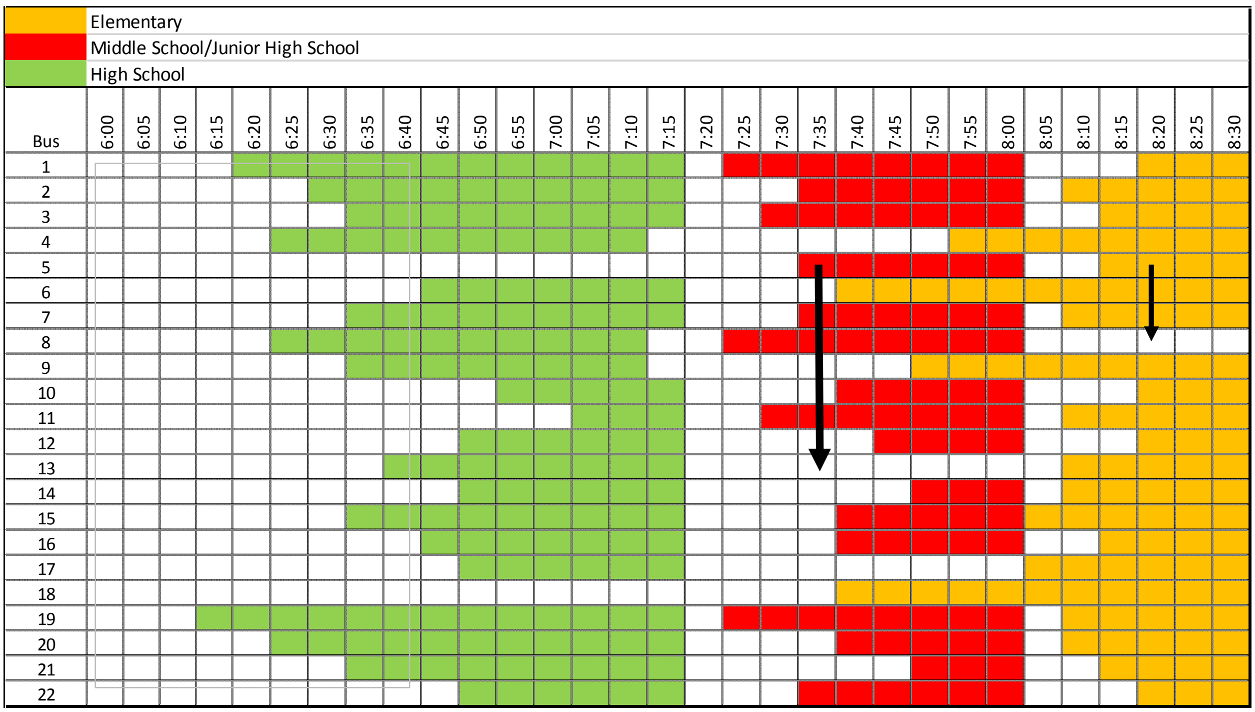
The number of schools served by a bus each morning and afternoon is the biggest factor in cost effectiveness. The table shown in Figure 47 below illustrates how the number of buses is affected by school bell times. These opportunities to utilize buses more fully may not exist in smaller, sparsely populated districts. But, since the larger districts receive a large share of total reimbursement, it is important to target multiple routing efforts in those districts.

Figure 47. Vehicles Needed with Single and Multiple Routes

Number of Routes Assigned to Each Bus in the Morning or Afternoon	7:00 to 7:15	7:16 to 7:30	7:31 to 7:45	7:46 to 8:00	8:01 to 8:15	8:16 to 8:30	8:31 to 8:45	8:46 to 9:00	Students Transported	72 Passenger Buses Needed
Single Route	Elementary and Secondary on Same Buses								2,000	28
Two Routes	Secondary			Elementary					2,000	14
Three Routes	High School		Middle School		Elementary				2,000	10
Three Routes, Longer Distances and Times to High School and Middle School	High School			Middle School			Elementary		2,000	10

Multiple routes mean that a bus does a run for one school followed by a run for another school or even a third school. Multiple routes require school bell times to be staggered, allowing a bus to pick up students for the first school, drop them off at the school, and then begin to pick up students for the next school. In multiple routing situations, bus runs can be visualized as shown in the example below (Figure 48), which allows options to be identified easily. Each row represents a bus, the columns represent five-minute time increments, and the colors differentiate schools. The first row indicates that the bus serves a high school run (in green) and a middle school run (in red). That bus also does an elementary run like many other buses shown. Other buses may only serve one run or have large amounts of idle time (in white) that may be available to take a run away from another bus. If that other bus has only one run, it can be eliminated. Some buses with two runs may be accommodated by two other buses each, taking away one run. Bell-time adjustments may be necessary and even small changes to bell times can provide more opportunities to assign multiple routes to a bus. Black arrows indicate an opportunity to reduce a bus by reassigning a middle school/junior high school bus run to one bus and an elementary school bus run to another bus.

Figure 48. Daily Timeline of Bus Utilization



The regulations currently require justification to add vehicles and require consideration of multiple routes in adding buses. Various factors restrict the option of multiple routes. For example, a sparsely populated district with all schools located near each other may need to have long bus rides with few students on the bus. Adjustment to bell times may be required to allow multiple routing and require extensive analysis, planning, and communication.

Promoting Efficiency by Reducing the Number of Buses Required

Seating Capacity

Larger buses with more seating capacity can reduce costs by reducing the number of buses purchased and drivers employed. The initial purchase price, amortized over the life of the vehicle, and the operating costs are small compared to the cost of the driver, including salary and benefits. In addition, the seating capacity of buses purchased should also be carefully considered, as larger buses may be able to replace two smaller buses, thereby saving the costs of a driver's salary and benefits.

The process of justifying and reviewing bus replacement proposals should systematically review both the utilization of seating capacity and time available at each school and the potential for multiple routes before approving new buses. If efficiencies are possible, funding incentives could be offered to fund the purchase of larger buses and an efficient mix of correctly sized buses.

Providing Technical Assistance in Bus Routing

Modern school transportation routing software is very sophisticated and uses the capabilities of navigation systems increasingly common in passenger and commercial vehicles. Extensive training is necessary on both the software options and the strategies for efficiency. Routing efficiency improvement plans may take several years to implement through wise sequencing of various strategies. While software, Global Positioning Systems, and training are currently reimbursable, the use of these methods may require incentives and funding of demonstration projects. Technical assistance with sophisticated transportation routing software and methods can reduce route mileage as well as improve utilization of capacity and ride time. The assistance should be focused on districts with rapid increases in daily miles.

New Regulation Affects Transportation Reimbursement in 2018-19

New regulations will affect both the reimbursement for operating costs and for capital outlay. The regulations are contained in W.S. 21-13-320 adopted in March 2017.

Transportation Reimbursement

Table 4 shows that transportation reimbursement increases in the past five years are much lower than the prior 10 years and have averaged 2.46 percent in the most recent five years. (From 2001-02 to 2010-11, annual cost increases ranged from 4.6 percent to 18.8 percent. as shown in the table.) Using estimated amounts, the table also shows that using the three-year averaging method of the new regulation will reduce future reimbursement in 2018-19 by just under $5.3 million compared to the previous formula. Assuming that the reimbursement calculation is not increased in the future, through either a rolling three-year average or a transportation cost index, the reimbursement in the fifth year would be approximately $13.7 million less than the previous 100 percent reimbursement formula would have provided.

Table 4
Operating Cost Reimbursement

Reimbursement Year	Operations Year	3510 - To and From School	3520 - Activities	Grand Total	New Regulation (average of 2014-15, 2015-16, 2016-17)	Difference-New Regulation Less Projected Old Regulation	$ Increase in Total Reimburse-ment over Prior Year	% Increase in Total Reimburse-ment over Prior Year	
2002-03	2001-02	$29,882,894	$3,653,731	$33,536,625					
2003-04	2002-03	$31,630,426	$3,759,870	$35,390,296			1,853,671	5.53%	
2004-05	2003-04	$33,821,395	$4,202,481	$38,023,876			2,633,580	7.44%	
2005-06	2004-05	$37,271,450	$4,739,957	$42,011,407			3,987,531	10.49%	
2006-07	2005-06	$44,452,802	$5,469,919	$49,922,722			7,911,315	18.83%	
2007-08	2006-07	$49,296,512	$6,410,490	$55,707,002			5,784,280	11.59%	
2008-09	2007-08	$52,125,597	$6,314,882	$58,440,478			2,733,476	4.91%	
2009-10	2008-09	$54,531,373	$6,594,009	$61,125,383			2,684,905	4.59%	
2010-11	2009-10	$57,076,656	$7,208,395	$64,285,051			3,159,668	5.17%	
2011-12	2010-11	$61,156,581	$7,867,602	$69,024,182			4,739,131	7.37%	
2012-13	2011-12	$63,313,445	$7,827,199	$71,140,644			2,116,462	**3.07%**	
2013-14	2012-13	$64,716,747	$8,314,887	$73,031,633			1,890,989	**2.66%**	
2014-15	2013-14	$67,144,167	$8,309,598	$75,453,766			2,422,133	**3.32%**	**5-Year**
2015-16	2014-15	$68,201,668	$8,079,112	$76,280,780			827,014	**1.10%**	**Average**
2016-17	2015-16	$69,915,747	$8,033,888	$77,949,635			1,668,855	**2.19%**	**2.46%**
2017-18	2016-17		**Projected at 5-year average increase in reimbursement of 2.46%**	$79,871,054					
2018-19	2017-18			$81,839,835	$76,561,394	($5,278,442)	The difference increases in the future assuming that the reimbursement calculation remains at the three years selected in the new regulation.		
2019-20	2018-19			$83,857,146	$76,561,394	($7,295,752)			
2020-21	2019-20			$85,924,182	$76,561,394	($9,362,788)			
2021-22	2020-21			$88,042,170	$76,561,394	($11,480,776)			
2022-23	2021-22			$90,212,365	$76,561,394	($13,650,971)			

Capital Outlay

Reimbursement for capital outlay is also affected by the new regulation, which requires any bus purchase to apply for approval on an emergency basis. Table 5 indicates that past reimbursement levels have fluctuated between $9.6 and $17.8 million. Between 2015-16 and 2016-17, reimbursements for capital outlay increased by $4.1 million or 30 percent. Under the new March 2017 regulation, the amount of reimbursement will depend on how an emergency is defined and administered. Assuming that emergency is defined very strictly, resulting in very few new buses being reimbursed, the total reimbursement can be expected to decrease each year.

Table 5
Capital Outlay Reimbursement

School Year	Total Capital Outlay
2002-03	$9,637,817
2003-04	$11,674,903
2004-05	$11,150,576
2005-06	$10,925,379
2006-07	$10,656,147
2007-08	$13,015,680
2008-09	$13,036,929
2009-10	$10,796,450
2010-11	$11,806,517
2011-12	$14,422,061
2012-13	$17,171,174
2013-14	$14,263,408
2014-15	$12,741,625
2015-16	$13,683,907
2016-17	$17,806,728
Grand Total	**$192,789,301**

Impact of the New Regulation on School Districts

To determine the impact on each school district, it is necessary to project the reimbursement for 2017-18 and 2018-19. These projections were made for each district on the basis of the two-year average increase or decrease for that district. The 2018-19 reimbursement is calculated for the new regulation using the three-year average reimbursement for 2014-15, 2015-16, and 2016-17. The comparison of reimbursement for the new and old regulation is shown in Table 6 in the column labeled "Difference". The total difference for all districts is a reduction of $4,888,280 in reimbursement. It is important to remember that these numbers are based on projected expenses compounded for two years. Therefore, the actual reimbursement could vary significantly and must be calculated based on the best available data at that time.

Table 6
Projected Operating Cost Reimbursement Impact by School District

District	FY 2014-15 (*2013-14 expenditures*)	FY 2015-16 (*2014-15 expenditures*)	FY 2016-17 (*2015-16 expenditures*)	FY 2017-18 (Projected 2016-17 expenditures)	FY 2018-19 (Projected 2017-18 expenditures)	Adjusted Three-year Average[3]	Difference
Albany #1	$3,003,215	$3,073,351	$3,161,281	$3,243,418	$3,327,688	$3,088,474	($239,215)
Big Horn #1	$883,502	$846,451	$792,935	$751,242	$711,742	$840,963	$129,221
Big Horn #2	$392,553	$393,799	$415,905	$428,239	$440,939	$400,752	($40,187)
Big Horn #3	$542,476	$520,738	$605,134	$642,047	$681,212	$556,116	($125,096)
Big Horn #4	$447,514	$476,023	$416,249	$403,374	$390,896	$446,595	$55,699
Campbell #1	$9,003,272	$8,789,588	$9,330,482	$9,506,847	$9,686,545	$9,041,114	($645,431)
Carbon #1	$1,297,677	$1,376,700	$1,604,389	$1,785,912	$1,987,973	$1,432,544	($555,429)
Carbon #2	$1,017,402	$930,969	$1,033,677	$1,046,789	$1,060,067	$994,016	($66,050)
Converse #1	$1,131,353	$1,185,838	$1,179,325	$1,204,484	$1,230,180	$1,165,505	($64,675)
Converse #2	$435,716	$498,138	$453,178	$465,189	$477,519	$464,268	($13,251)
Crook #1	$1,217,224	$1,346,243	$1,320,669	$1,378,117	$1,438,063	$1,300,701	($137,362)
Fremont # 1	$1,337,249	$1,469,390	$1,413,825	$1,456,948	$1,501,385	$1,406,822	($94,564)
Fremont # 2	$252,349	$219,460	$258,796	$265,125	$271,609	$243,535	($28,074)
Fremont # 6	$659,760	$586,851	$573,193	$534,852	$499,075	$606,602	$107,526
Fremont #14	$676,778	$667,270	$766,872	$818,720	$874,073	$703,640	($170,433)
Fremont #21	$420,271	$474,109	$489,894	$529,427	$572,151	$461,425	($110,726)
Fremont #24	$513,671	$570,159	$618,300	$678,400	$744,342	$567,377	($176,965)
Fremont #25	$1,315,969	$1,276,186	$1,243,473	$1,208,740	$1,174,977	$1,278,543	$103,566
Fremont #38	$733,925	$780,033	$984,091	$1,143,724	$1,329,251	$832,873	($496,378)
Goshen #1	$1,685,439	$1,723,191	$1,742,684	$1,772,058	$1,801,927	$1,717,105	($84,822)
Hot Springs #1	$791,446	$809,419	$901,823	$963,540	$1,029,480	$834,229	($195,251)
Johnson #1	$1,170,133	$1,120,504	$1,106,927	$1,076,746	$1,047,388	$1,132,521	$85,133
Laramie #1	$8,115,891	$9,010,478	$8,929,654	$9,381,746	$9,856,728	$8,688,795	($1,167,932)
Laramie #2	$1,753,762	$1,771,918	$1,653,819	$1,607,266	$1,562,024	$1,726,500	$164,476
Lincoln #1	$506,319	$537,002	$506,772	$507,863	$508,956	$516,698	$7,741
Lincoln #2	$3,150,272	$3,280,184	$3,312,377	$3,396,929	$3,483,640	$3,248,181	($235,459)
Natrona #1	$8,974,641	$9,629,945	$9,329,816	$9,525,047	$9,724,363	$9,311,467	($412,896)
Niobrara #1	$460,761	$467,442	$473,780	$480,427	$487,167	$467,328	($19,839)
Park # 1	$1,165,851	$1,025,050	$910,026	$804,015	$710,354	$1,039,574	$329,220
Park # 6	$1,350,780	$1,366,267	$1,357,641	$1,361,137	$1,364,643	$1,358,230	($6,414)
Park #16	$189,820	$202,493	$197,566	$201,757	$206,037	$196,627	($9,411)
Platte #1	$987,922	$1,103,194	$1,088,296	$1,144,440	$1,203,480	$1,059,804	($143,676)
Platte #2	$130,168	$154,471	$148,346	$159,254	$170,964	$144,328	($26,636)
Sheridan #1	$712,188	$696,702	$678,000	$661,529	$645,459	$695,630	$50,171
Sheridan #2	$1,730,647	$1,677,702	$1,595,090	$1,531,419	$1,470,290	$1,668,634	$198,344
Sheridan #3	$241,040	$285,492	$236,969	$238,682	$240,408	$279,500	$39,093

[3] The adjusted three-year average is the average of fiscal years 2013-14 through 2016-17. The final allocations are subject to adjustments for refunds of prior year expenditures and audit reviews conducted under W.S. 9-1-513.

District	FY 2014-15 (*2013-14 expenditures*)	FY 2015-16 (*2014-15 expenditures*)	FY 2016-17 (*2015-16 expenditures*)	FY 2017-18 (Projected 2016-17 expenditures)	FY 2018-19 (Projected 2017-18 expenditures)	Adjusted Three-year Average[3]	Difference
Sublette #1	$1,067,325	$1,001,723	$1,042,681	$1,031,954	$1,021,336	$1,037,243	$15,907
Sublette #9	$578,339	$589,936	$562,860	$555,587	$548,408	$577,045	$28,637
Sweetwater #1	$4,044,140	$4,098,343	$4,327,481	$4,477,456	$4,632,628	$4,183,416	($449,212)
Sweetwater #2	$1,919,162	$1,871,209	$1,839,148	$1,800,414	$1,762,497	$1,876,506	$114,009
Teton #1	$2,808,100	$2,778,094	$2,991,081	$3,089,759	$3,191,692	$2,859,092	($332,600)
Uinta #1	$1,784,802	$1,882,604	$1,829,941	$1,854,483	$1,879,355	$1,832,449	($46,907)
Uinta #4	$525,275	$591,046	$598,216	$639,296	$683,198	$571,512	($111,685)
Uinta #6	$557,336	$647,211	$624,062	$663,220	$704,834	$609,536	($95,298)
Washakie #1	$609,448	$592,631	$612,763	$614,716	$616,675	$604,947	($11,728)
Washakie #2	$134,570	$133,265	$163,206	$180,748	$200,176	$143,680	($56,496)
Weston #1	$718,963	$697,697	$700,473	$691,507	$682,656	$705,711	$23,055
Weston #7	$256,731	$236,482	$233,230	$222,428	$212,126	$242,148	$30,021
State	$73,403,146	$75,462,989	$76,356,397	$78,127,019	$80,048,579	$75,160,299	($4,888,280)

Source: WDE103-Reimbursable Pupil Transportation Expenditures, WDE100-School Foundation Program Funding Worksheet.

Conclusions on March 2017 Funding Changes

The new method of reimbursement adopted in March 2017 will require school districts to reduce transportation expenses or to fund transportation by reallocating other resources within district budgets. This new method of reimbursement has several limitations. It does not adjust for changing enrollments resulting in growing districts facing more funding and operating challenges than districts with declining enrollments. Districts with an increasing number of students to be transported because of new residential developments requiring more busing or new schools located beyond walking zones will also face disproportionate funding challenges. Although the March 2017 regulation may create financial pressure on school districts to economize in transportation, it does not provide any specific measures to promote efficiency and cost-effective transportation systems. In addition, capital outlay reimbursement provisions are restricted to emergency replacements. Depending on how emergency is defined and administered, this provision may limit opportunities to provide more reliable and fuel efficient vehicles that can reduce operating costs. Despite these limitations, this March 2017 change in funding can serve to draw attention to transportation cost increases and the potential for transportation efficiency improvements. In that way, it can serve to help transition from the prior 100 percent funding method to a linear density formula to be discussed in the next section.

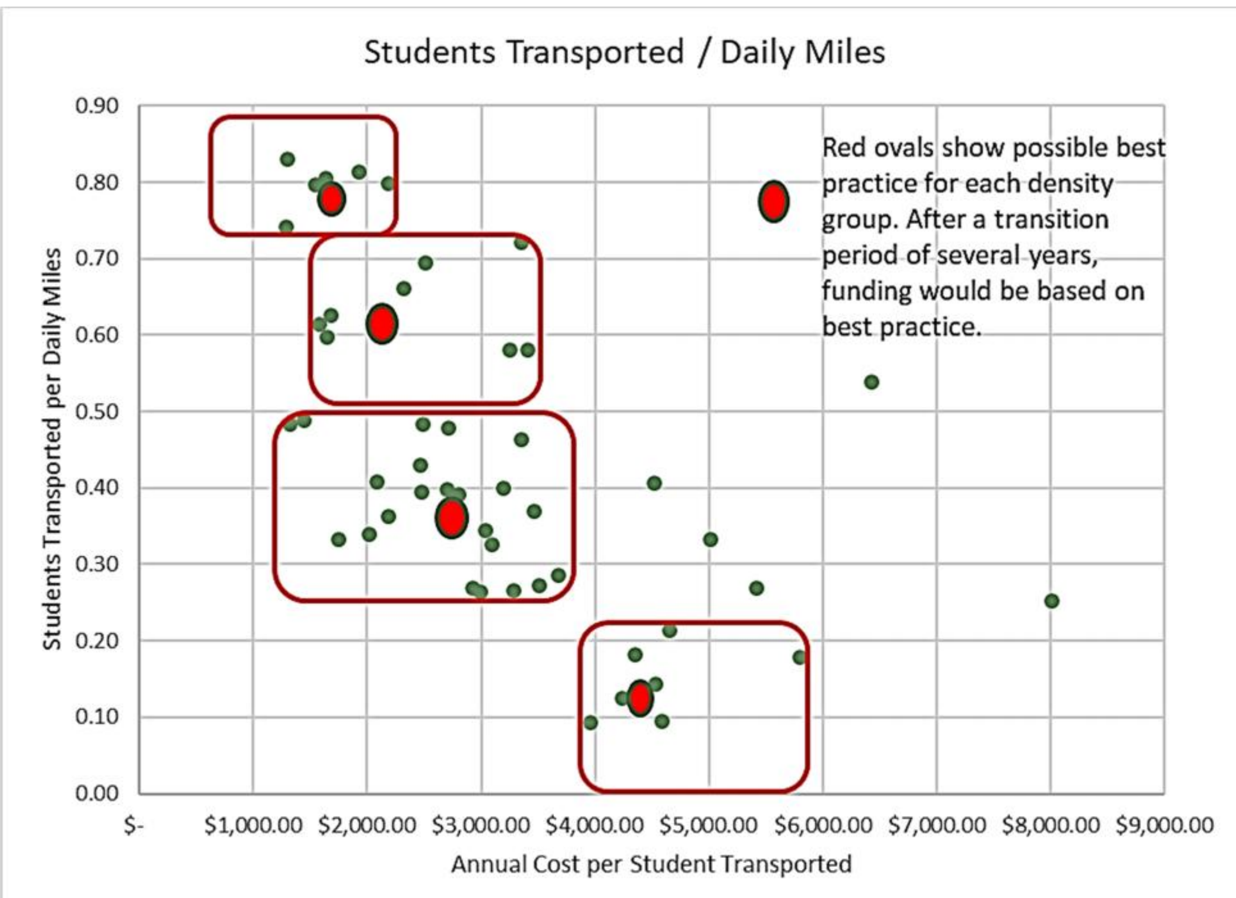
Transitioning to a Density Formula

A linear density model is proposed for the funding of transportation to and from school. For several reasons, the current funding method is recommended to continue for activity transportation and capital outlay. Linear density is defined as the number of students transported per mile. For example, if 40 students are transported for every 80 miles traveled, the linear density is 0.5. If 100 students are transported for every 100 miles traveled, the linear density is 1.0. In Wyoming in 2016-17, the linear density ranges from 0.093 to 0.83 students per mile, or less than one student for every 10 miles traveled to more than eight students for every 10 miles. The linear density formula is applied only to the miles to and from school and not the activity miles. This is because activity miles are determined by how far students must travel to participate in extracurricular activities, which can vary greatly particularly for remote school districts with few students and long travel distances.

The Linear Density Concept

The linear density concept is shown in Figure 49, which utilizes 2016-17 transportation data for all school districts. Each blue dot identifies (on the vertical axis) the students transported per daily miles traveled, the linear density. The horizontal axis represents annual reimbursement for each student transported. Each density group of school districts is outlined by a red rectangle. The solid red oval represents possible best practices for each density group and the ovals are placed to show better than average cost effectiveness. The four red ovals illustrate that higher cost is reasonable for lower density. A small number of districts are high cost outliers in this example and should be evaluated separately. Based on that evaluation, those districts may need to be treated separately with technical assistance to develop a transportation efficiency improvement plan, transitional funding adjustments, or exemption from the formula based on unique circumstances.

Figure 49. Linear Density Concept



Promoting Cost Effectiveness through a Linear Density Model

Best practices will be developed for each linear density group. Best practices would include maximum utilization of seating capacity, use of multiple routes each morning and afternoon (high school bus run, followed by a middle school bus run, followed by an elementary bus run), minimal variation in ride time, and other factors. Over a transition period of several years, the funding for each density group would be paid based on best practice for that linear density group. Although it will take several years to develop best practice funding levels, it is assumed that best practice will be less than current average practice for a density group. A transition plan discussed later will involve a Transportation Advisory Committee and others to define best practice and establish funding levels for each density group. While the example above illustrates four linear density groups, it would be possible to increase the number of density groups during the transition period. Technical assistance will be necessary to help transportation managers and school districts plan and implement best practices.

Data Management

Detailed transportation data is necessary to promote best practice by establishing performance measures. A series of performance measures will define best practices and detailed and reliable data is required to measure current performance for each school district and the gap between current and best practice. (As shown in charts throughout the report, some data anomalies appear in various types of trend data.) Consistent accounting definitions must be followed, particularly regarding capital outlay between to and from school expenditures and activities expenditures. This is especially important since capital outlay funding will be provided on an emergency only basis under the March 2017 change in regulations.

Use of geographic information system (GIS) and navigation software is continually expanding in school transportation. This software provides many additional capabilities that will help with performance measurements, refinement of best practices, and implementation of changes. Achieving full potential from these capabilities will require continual updates to the software and underlying computer maps as well as extensive training. While many school districts use the software for recordkeeping and reporting of transportation information, it takes well trained and highly sophisticated users to use the capabilities of the software to achieve optimal routing efficiency and cost effectiveness.

Funding Levels

Based on the conceptual model shown in Table 7, best practice funding levels after a transition period could be as shown in Table 8. For illustration purposes, these potential best practice funding levels have been selected at 5 percent below average practice for each linear density group. (In several cases, a high cost outlier was excluded from the average calculation.) The eventual best practice funding levels will be established after efforts during the proposed funding transition period discussed later.

Table 7
Potential Best Practice Funding Levels

Linear Density–Students Transported per Mile	Potential Best Practice Funding
0.10 to 0.25	$4,360
0.26 to 0.50	$2,810
0.51 to 0.72	$2,340
0.73 to 0.90	$1,570

Using these estimated best practice funding levels, a comparison has been developed for current reimbursement and estimated best practice reimbursement. The amounts are shown in Table 8. While reviewing these data, it is important to understand that a multi-year transition plan is proposed that recommends technical assistance for all districts, particularly for districts with higher costs than their density group. In addition, during the transition period, transitional funding could be provided to districts working to improve efficiency and cost effectiveness. These recommendations are discussed in more detail later in the report.

Table 8
Reimbursement by Linear Density Group

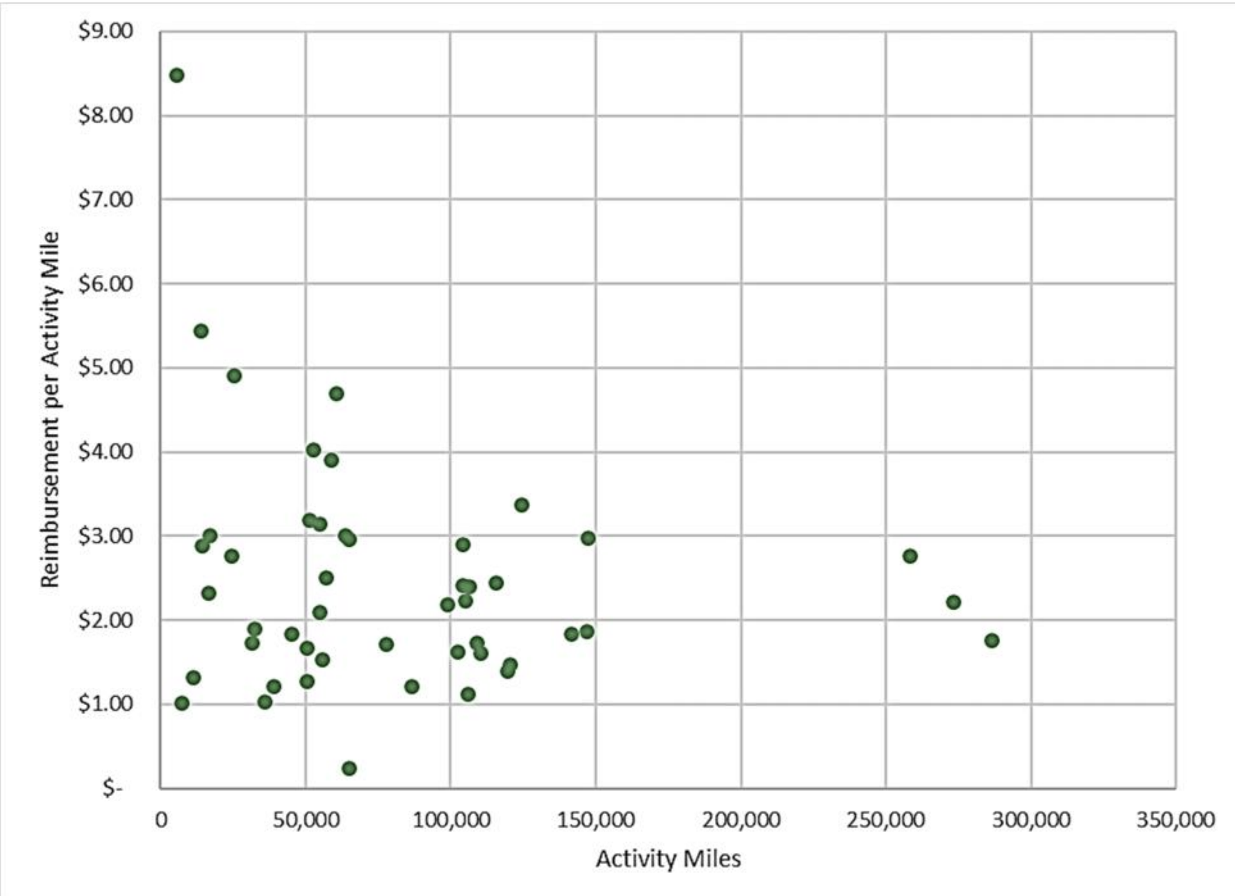
District Name	2006-17 Reimbursement: Vehicle Operation-To and-From School	Annual Per Student Reimbursement: Students Transported To/From School	Linear Density Students Transported per Daily Miles	Students Transported 2016-17	Best Practice Estimate for Each Density Group	Difference: Estimated Best Practice Less Current Reimbursement per Student	Reimbursement Gain (Loss)	Reimbursement Reductions if Higher than Best Practice is Reimbursed at Best Practice
Sheridan #3	$317,049	$3,963	0.09259	80	$4,360	$397	$31,751	$0
Niobrara #1	$422,184	$4,589	0.09514	92	$4,360	($229)	($21,064)	($21,064)
Weston #7	$250,149	$4,240	0.12500	59	$4,360	$120	$7,091	$0
Washakie #2	$172,344	$4,535	0.14286	38	$4,360	($175)	($6,664)	($6,664)
Platte #2	$150,975	$5,807	0.17808	26	$4,360	($1,447)	($37,615)	($37,615)
Laramie #2	$2,234,489	$4,356	0.18263	13	$4,360	$4	$2,191	$0
Platte #1	$1,276,474	$4,659	0.21440	74	$4,360	($299)	($81,834)	($81,834)
Fremont #2	$392,476	$8,010	0.25258	49	$4,360	($3,650)	($178,836)	($178,836)
Fremont #24	$679,250	$2,992	0.26365	227	$2,810	($182)	($41,380)	($41,380)
Goshen #1	$1,755,382	$3,281	0.26564	535	$2,810	($471)	($252,032)	($252,032)
Fremont #1	$1,811,311	$5,423	0.26935	334	$2,810	($2,613)	($872,771)	($872,771)
Big Horn #4	$495,160	$2,930	0.26954	169	$2,810	($120)	($20,270)	($20,270)
Big Horn #3	$502,730	$3,516	0.27290	143	$2,810	($706)	($100,900)	($100,900)
Carbon #2	$1,070,220	$3,678	0.28585	291	$2,810	($868)	($252,510)	($252,510)
Albany #1	$3,709,171	$3,096	0.32625	1,198	$2,810	($286)	($342,791)	($342,791)
Hot Springs #1	$969,009	$5,021	0.33219	193	$2,810	($2,211)	($426,679)	($426,679)
Sublette #9	$487,336	$1,753	0.33293	278	$2,810	$1,057	$293,844	$0
Crook #1	$1,531,116	$2,023	0.33916	757	$2,810	$787	$596,054	$0
Park #1	$1,107,898	$3,044	0.34405	364	$2,810	($234)	($85,058)	($85,058)
Lincoln #2	$3,821,951	$2,190	0.36226	1,745	$2,810	$620	$1,081,499	$0
Laramie #1	$10,734,189	$3,463	0.36900	3,100	$2,810	($653)	($2,023,189)	($2,023,189)
Sublette #1	$1,199,446	$2,802	0.39087	428	$2,810	$8	$3,234	$0
Fremont #6	$800,519	$2,478	0.39487	323	$2,810	$332	$107,111	$0
Campbell #1	$12,008,738	$2,700	0.39734	4,447	$2,810	$110	$487,332	$0

District Name	2006-17 Reimbursement: Vehicle Operation-To and-From School	Annual Per Student Reimbursement: Students Transported To/From School	Linear Density Students Transported per Daily Miles	Students Transported 2016-17	Best Practice Estimate for Each Density Group	Difference: Estimated Best Practice Less Current Reimbursement per Student	Reimbursement Gain (Loss)	Reimbursement Reductions if Higher than Best Practice is Reimbursed at Best Practice
Natrona #1	$8,975,458	$3,194	0.39932	2,810	$2,810	($384)	($1,079,358)	($1,079,358)
Washakie #1	$808,723	$4,518	0.40590	179	$2,810	($1,708)	($305,733)	($305,733)
Big Horn #2	$297,664	$2,082	0.40857	143	$2,810	$728	$104,166	$0
Weston #1	$613,042	$2,472	0.42907	248	$2,810	$338	$83,838	$0
Big Horn #1	$858,551	$3,354	0.46377	256	$2,810	($544)	($139,191)	($139,191)
Converse #2	$530,154	$2,719	0.47912	195	$2,810	$91	$17,796	$0
Sheridan #2	$1,549,532	$1,327	0.48284	1,168	$2,810	$1,483	$1,732,548	$0
Uinta #4	$708,576	$2,486	0.48387	285	$2,810	$324	$92,274	$0
Fremont #14	$688,437	$1,449	0.48818	475	$2,810	$1,361	$646,313	$0
Park #16	$180,084	$6,432	0.53846	28	$2,340	($4,092)	($114,564)	($114,564)
Sweetwater #2	$3,527,084	$3,414	0.58034	1,033	$2,340	($1,074)	($1,109,864)	($1,109,864)
Teton #1	$3,453,805	$3,249	0.58119	1,063	$2,340	($909)	($966,385)	($966,385)
Johnson #1	$1,011,279	$1,644	0.59651	615	$2,340	$696	$427,821	$0
Converse #1	$1,364,035	$1,579	0.61364	864	$2,340	$761	$657,725	$0
Sheridan #1	$800,901	$1,676	0.62647	478	$2,340	$664	$317,619	$0
Uinta #6	$645,315	$2,321	0.66033	278	$2,340	$19	$5,205	$0
Lincoln #1	$564,786	$2,510	0.69444	225	$2,340	($170)	($38,286)	($38,286)
Fremont #38	$1,348,026	$3,353	0.72172	402	$2,340	($1,013)	($407,346)	($407,346)
Fremont #25	$1,097,627	$1,291	0.74106	850	$1,570	$279	$236,873	$0
Sweetwater #1	$4,618,314	$1,547	0.79706	2,985	$1,570	$23	$68,136	$0
Carbon #1	$1,730,902	$2,183	0.79779	793	$1,570	($613)	($485,892)	($485,892)
Park #6	$1,467,342	$1,634	0.80538	898	$1,570	($64)	($57,482)	($57,482)
Uinta #1	$1,806,589	$1,932	0.81304	935	$1,570	($362)	($338,639)	($338,639)
Fremont #21	$481,248	$1,297	0.82998	371	$1,570	$273	$101,222	$0
						Total Potential Savings		($9,786,334)

Activities Transportation Funding

An analysis of activity transportation reimbursement per activity mile indicates a wide range of costs per mile, as shown on Figure 50. The current regulations establish allowable costs with the objective of providing students a full range of extracurricular opportunities regardless of district size or location. Therefore, to maintain the ability to provide these activities for all students, the activity reimbursement methods should not change.

Figure 50. Activity Reimbursement per Activity Mile, 2015-16



Capital Outlay Funding

The new regulations approved in March 2017 continue to fund vehicle purchases approved in prior years. Funding for any new vehicles is subject to an emergency definition that should be defined in detail and publicized. If a district's transportation efficiency improvement plan requires a change in the type and capacity of vehicles, funding should be provided.

Transition Plan

A multi-year transition plan will be necessary to move from the current three-year averaging method of funding approved in March 2017, towards a best practice model combined with the linear density method. School transportation involves complex systems and, given the importance of providing safe and reliable student transportation, changes must be well planned and implemented. Therefore, it will take several years to implement changes. During the transition, efforts should concentrate on assisting districts that are spending more than their linear density peer group. The formula effective in 2018-19 will require districts to improve cost effectiveness and efficiency, since many school districts will lose expected funding for both to-and-from school and capital outlay. The elements of the recommended transition plan are shown in Table 9. A plan for phasing-in the linear density formula could be adjusted from what is described below to allow districts more time to adjust to the new efficiency standards. For example, a three-year phase-in period could be provided starting with the new formula's first year of implementation in 2020-21. Under this phase-in plan, districts would receive 75 percent of the difference between current law funding and the amount calculated using the new formula. In the subsequent two years this amount would be reduced to 50 percent of the difference and 25 percent of the difference respectively.

Table 9
Proposed Transition Plan

Year	Funding	Planning for Best Practice and Linear Density
2018-19	New Regulation–3 Year Averaging	Identify best practice model districts for each linear density group. Model districts work with the Transportation Advisory Committee to develop performance measures and targets for each density group. Performance targets define best practice and differ by density group. Data quality is evaluated and any required improvements are implemented.
2019-20	New Regulation–3 Year Averaging (increased by rolling the three-year average forward by one year)	Technical assistance is offered to districts above the best practice funding level in each density group. Best practice performance targets are refined, performance measures are provided for each district, and a gap analysis is developed for each district. A transportation efficiency improvement planning method is developed by the Transportation Advisory Committee and training is offered to all school districts.
2020-21	Linear Density Method	Best practice funding levels are established for each linear density group and adjusted for regional cost differentials. Outlier districts are funded at an additional amount of one half of the gap between the March 2017 regulation amount and the best practice funding level in order to provide time to implement efficiency improvement plans. Regulations on allowable costs, promotion of multiple routes, and other efficiency factors are refined to include lessons from best practice research and efforts.
2021-22	Linear Density Formula–fully implemented at best practice levels by linear density group.	Technical assistance continues and performance targets for best practices are refined. The number of density groups is reevaluated.

Limiting Increases in Funding to a Transportation Cost Index

A transportation cost index could be established specific to Wyoming that would limit funding increases to the cost per student transported. This would increase reimbursement upon increases to the number of students transported and reduce reimbursement upon declining number of students transported. The index could also be applied to specific cost components, such as salaries, retirement, group insurance (primarily healthcare), and fuel. Trend charts shown in this report (Figures 16, 17, 18, 19, 20, and 21) illustrate that some districts receiving large reimbursements have experienced disproportionate increases in these costs.

AUGENBLICK,
PALAICH AND
ASSOCIATES

Supplemental Report G

Review of Shared Services and Consolidation

Prepared for the

Select Committee on School Finance Recalibration

By

Robert Schoch

Education Finance Decisions

On behalf of

Augenblick, Palaich and Associates

Final, January 12, 2018

Contents

I. Introduction

This study examines the opportunities for cooperatively providing and sharing services among school districts, including the option of total consolidation of existing school districts. Specific attention was given to shared services for special education, transportation, and gifted and talented programming. The analysis included a literature review, which informed the survey questions and the components of the consolidation model. We surveyed all districts to collect data on current cooperative or shared services, barriers that exist to cooperatively providing or sharing services, and the types of incentives that would encourage more of these activities. The study also evaluated consolidation opportunities to make recommendations regarding the characteristics of districts that could be candidates for consolidation.

School district consolidation has been researched and discussed for many decades throughout the United States. Therefore, it is important to start with a clear definition of consolidation. Consolidation of school districts is defined as combining two or more school districts into one district with new boundaries, a new organizational structure, and new programs. School building consolidation occurs when two school buildings combine their enrollments and one building is closed. The purpose of consolidation is to provide the same (or better) programs or services at the same (or lower) cost. Consolidation can improve the level of educational programs offered, expand available services for students, and equalize educational offerings throughout a region. The research results on school district consolidation are mixed on the both the fiscal and instructional impacts.

The potential fiscal impact of consolidation derives largely from eliminating one-of-a-kind positions, such as superintendents and business administrators. In larger districts, it is also easier to balance class sizes and thereby reduce instructional staff. Some support services may also benefit from economies of scale, such as vehicle maintenance or purchasing supplies or equipment in large quantities. Although the topic is controversial, consolidation has occurred in many states, including Wyoming in 1996.

In considering the savings offered by consolidation, it is important to note that other alternatives to consolidation can also yield these savings, often without controversy or other negative impacts. As part of the study, we identified the types of alternative opportunities that can achieve savings, and a full explanation of these options is provided later in this report. The continuum of alternatives ranges from full consolidation to informal sharing agreements, and includes intergovernmental agreements, minor redistricting, and expansion of cooperative services at a regional level.

We distributed a questionnaire to superintendents of each district to determine what is currently shared, what has been shared in the past, what would be considered for sharing, and what is not recommended for consideration. The results varied widely in terms of the types of staff, services, programs, or equipment potentially considered for sharing, but the results showed a general willingness to consider different sharing arrangements. Some of these programs would allow districts to offer more programs and services at a reasonable cost. In other cases, costs could be reduced.

We developed a financial model to illustrate the types of savings from sharing services, consolidating schools, or consolidating school districts. We have illustrated this information and data on a series of Wyoming maps showing all district boundaries. This format was selected because it allows the reader to quickly compare the variation among districts considering the proximity of school districts, which is an important factor in any decision-making regarding consolidation or sharing of services.

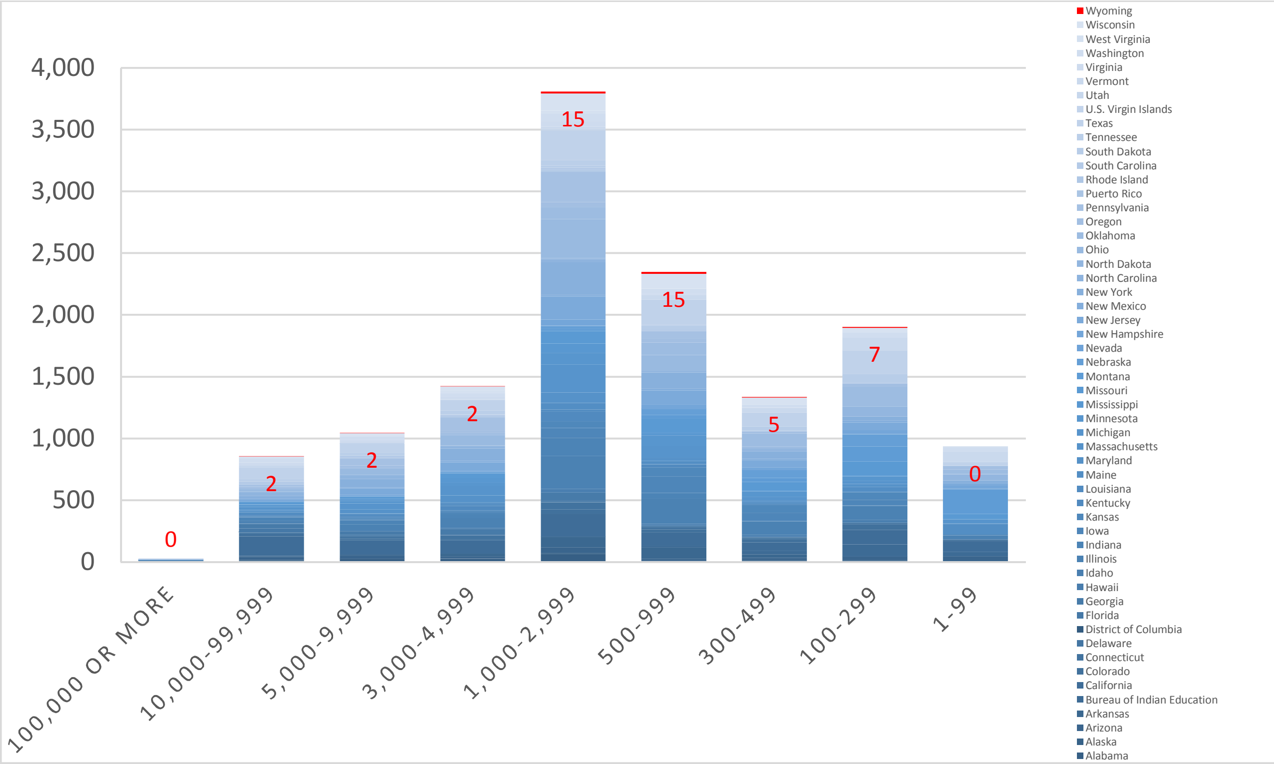
Background Information on Wyoming School Districts

Wyoming currently has 48 school districts and about 93,000 students, averaging around 1,900 students per district. District size varies widely, from fewer than 100 to more than 14,000 students per district. Previous consolidation and boundary realignment occurred most recently in 1996.

Wyoming is unique due to its low population density and land development patterns. Population density in the state is mostly concentrated in a few urban areas, while much of the state is very sparsely populated. Therefore, many school districts are very large by geographic area but small in terms of population and enrollment. Although it might be desirable to consolidate some of these low population districts, the distances and other geographical barriers involved may make such consolidation unfeasible.

Wyoming has a relatively small number of districts overall. Nationally, the number of districts per state ranges from one statewide district in Hawaii to over 1,000 districts in Texas. Some states have countywide districts. Across the nation, school districts range in enrollment from fewer than 100 students per district to more than 100,000, with the most frequent district size nationally being between 1,000 and 3,000 students. In general, the enrollment of Wyoming's school districts is proportionate to the nation.

Figure 1
Number of School Districts by District Size, FY 2011-12



Wyoming also has a relatively low number of districts compared to neighboring states. Montana has 417 districts, Colorado has 180, and Idaho has 116. Utah is comparable with 41 school districts, but Utah has a much larger population. Although Wyoming and Utah have a similar number of districts and the states are of similar area, Utah has seven times as many students as Wyoming. Average district size in Utah is over 15,000 students and roughly 80 percent of its school-age population is concentrated in urban and suburban areas. Wyoming is the reverse, with over 70 percent of its population living in rural areas and small towns.

Figure 2
Total School Districts in Each State

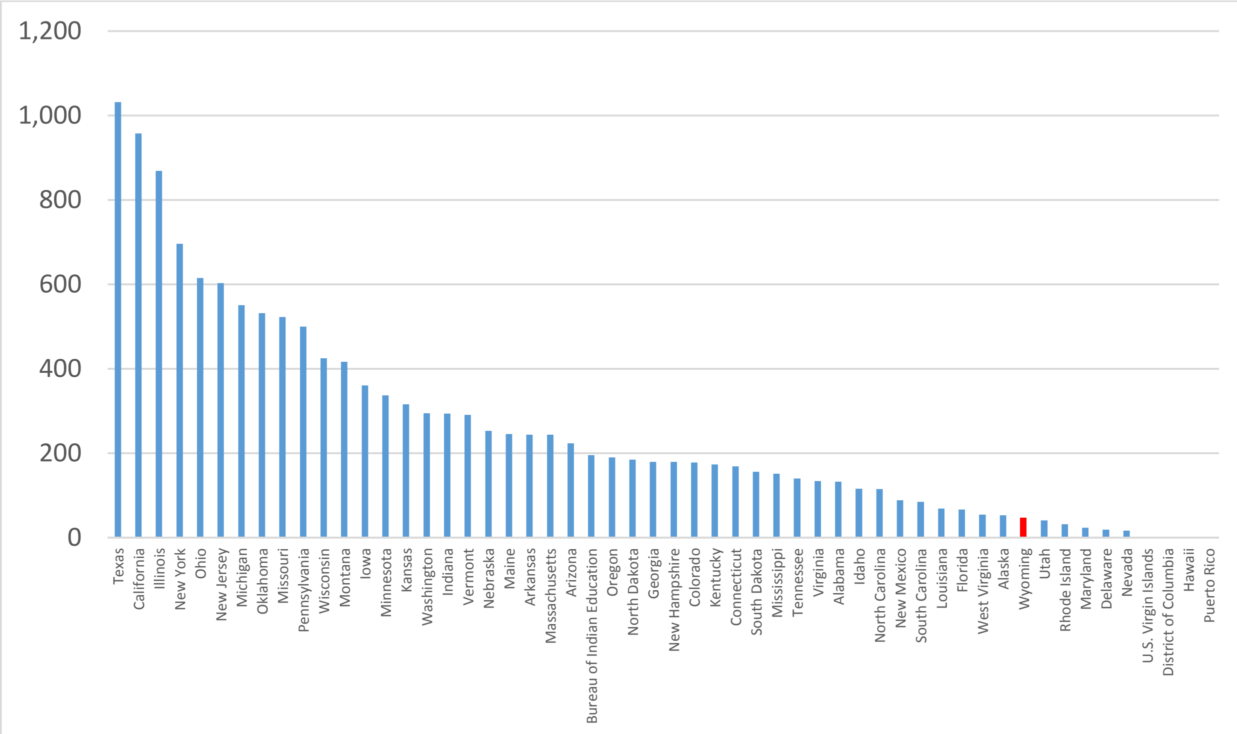
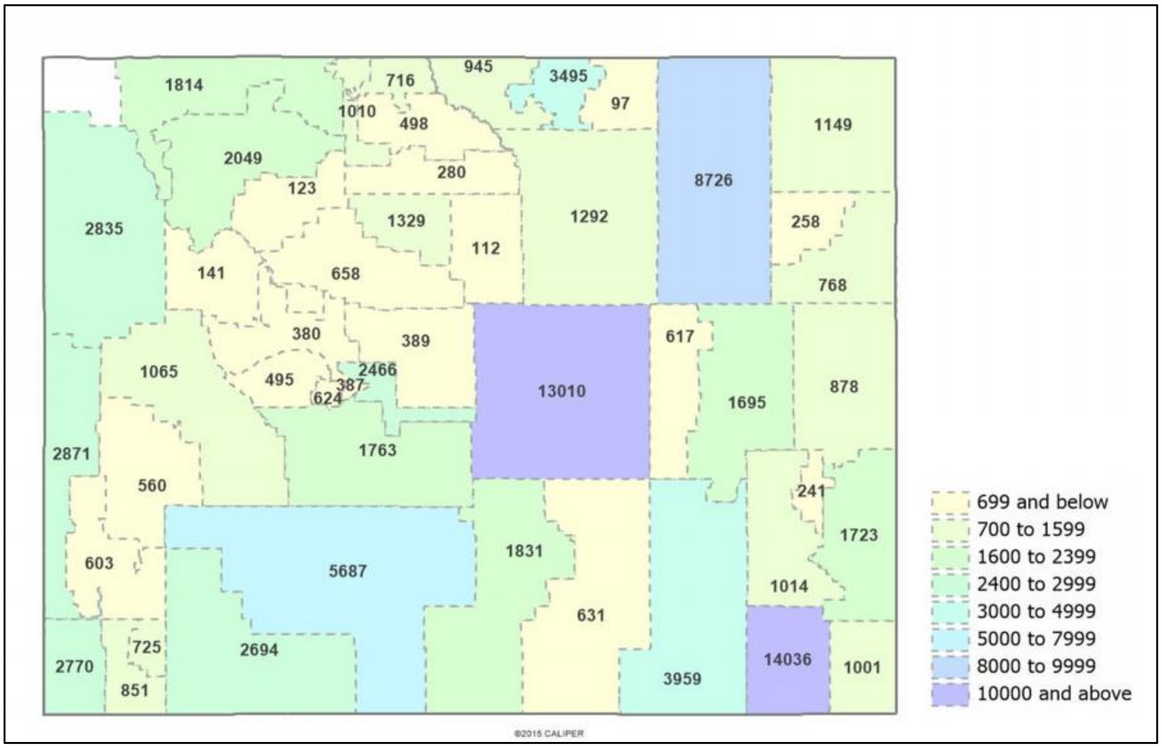


Figure 3 presents fall enrollment counts by school district for 2016-17.

Figure 3
Fall Enrollment Counts by District, FY 2016-17



School district boundaries follow county lines in many places. Figure 4 demonstrates this by showing county boundaries in solid lines and school district boundaries in dotted lines. Figure 5 shows more specifically how school district boundaries overlap county boundaries and that some counties contain multiple school districts.

Figure 4
County and School District Boundaries

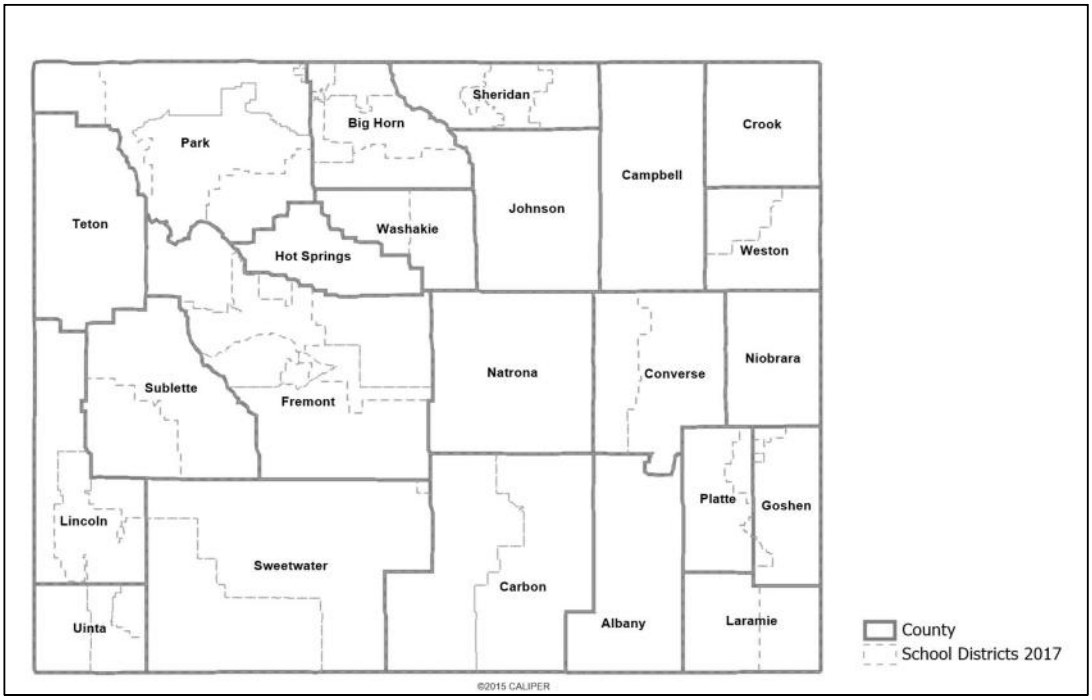
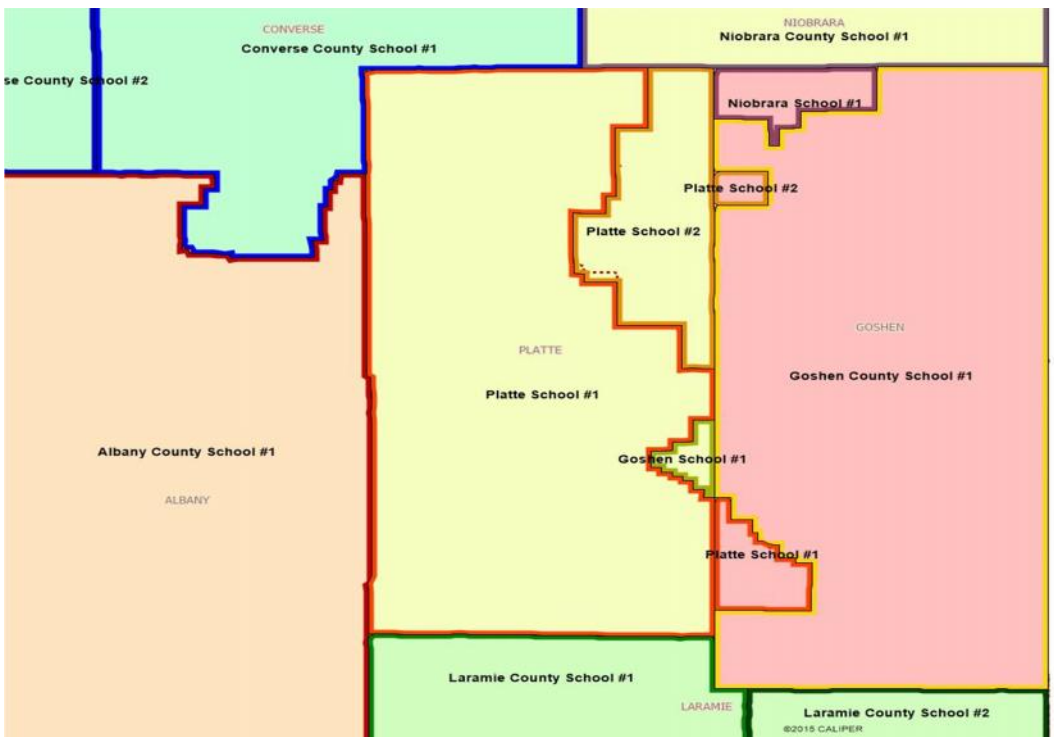


Figure 5
School District Boundaries Overlap County Boundaries



II. Consolidation

Research

Extensive literature exists on school consolidation, but the methodologies, results, and conclusions of these studies are mixed. Most studies focus on the advantages, disadvantages, and barriers to consolidation. Consolidation decisions involve balancing economic efficiency and educational effectiveness. The savings from district consolidation result largely from reducing the one-of-a-kind positions, such as superintendents, federal programs coordinators, curriculum coordinators, and business administrators. A New York study indicates a 31.5 percent net cost savings for doubling the enrollment of a district with 300 students and a 14.4 percent cost saving for doubling the enrollment of a district with 1,500 students (Duncombe and Yinger, 2007). According to the National Education Policy Center, "contemporary research, as a body and almost to a study, has not recommended consolidation either to save tax dollars or to improve the outcomes or quality of schooling" (National Education Policy Center, 2011).

In addition to economies of scale, consolidation offers benefits, such as being able to afford more specialized teachers and a wider range of courses. Larger districts can provide more extensive professional development and opportunities to collaborate with colleagues. Certain expenses, such as science laboratories, have a high per-pupil cost in small districts and may not be affordable. With more students, higher cost programs and services are more affordable.

Other factors are not favorable to consolidation. Consolidated school districts generally use larger schools, which necessitates longer driving distances and higher transportation costs. Consolidation may require leveling up salaries and benefits to the level of the higher-cost district. Teachers and administrators may have a more positive attitude when working in smaller schools. Parents and community members may believe that the culture of their local area schools will be damaged if districts are combined.

Some of the advantages of consolidation can be achieved through shared services, and avoiding the challenges and negative consequences of district consolidation. A continuum of alternatives to consolidation ranges from intergovernmental cooperation agreements between districts, minor realignment of district boundaries, school-level consolidation, and shared services offered through expansion of regional education service agencies, such as the Wyoming Board of Cooperative Educational Services (BOCES).

Consolidation

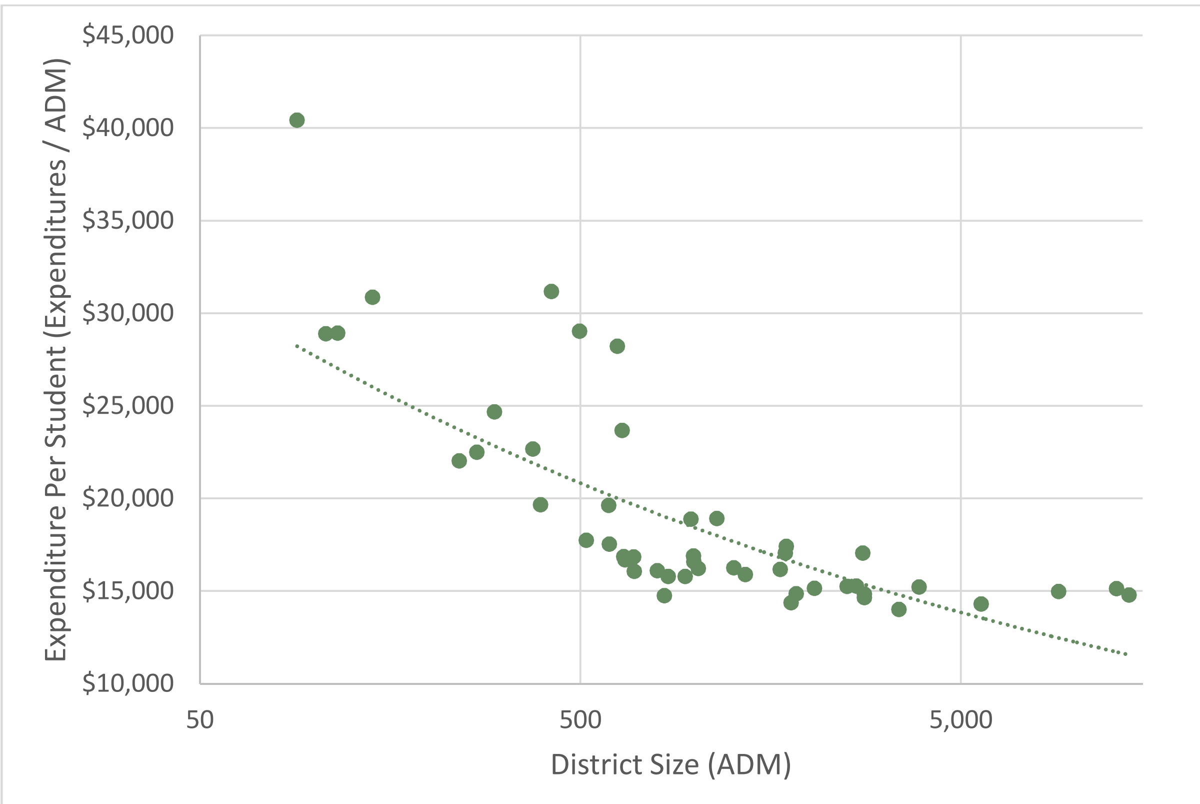
The research suggests there are both advantages and disadvantages to undertaking consolidation, with specific circumstances dictating whether the outcomes will be beneficial or not. Some of the factors to consider include changes in economies of scale, potential offsets to cost increases, and the effects of larger enrollment on student achievement and other student outcomes.

Economies of Scale

Potential economies-of-scale savings are possible through reduction of one-of-a-kind positions, such as superintendents, business managers, curriculum directors, federal program directors, and others. Additional savings may be possible through quantity purchasing and sharing of instructional resources.

The economies of scale for Wyoming school districts are shown on Figure 7. Districts under 500 students are spending $20,000 per student per year, while most of the districts with more than 500 students are spending less than $20,000 (note that the chart is shown in logarithmic scale for easier reading).

Figure 7
Wyoming School District Size vs. Expenditures Per Student, FY 2015-16 (logarithmic scale)



In small school districts, the percentage of total staff in certain categories is much higher than in larger districts. Figure 8 illustrates the comparison for administration staffing. The color shading for each district indicates a wide range from less than 1.8 percent to more than 10 percent. The circles centered on each district indicate the size of the total staff in full-time equivalent (FTE) staffing. Figure 9 illustrates the comparison for bus drivers. These data are presented in a map format to illustrate the wide variation in districts that may be able to share positions, either through consolidation or other alternatives. In these situations, the consolidation of certain districts would result in a lower percentage but not necessarily a reduction in total positions across the consolidated districts. That is because these decisions must be made based on the specific circumstances of the school districts.

Figure 8
Central Administration as a Percentage of Total Staff (FTE)

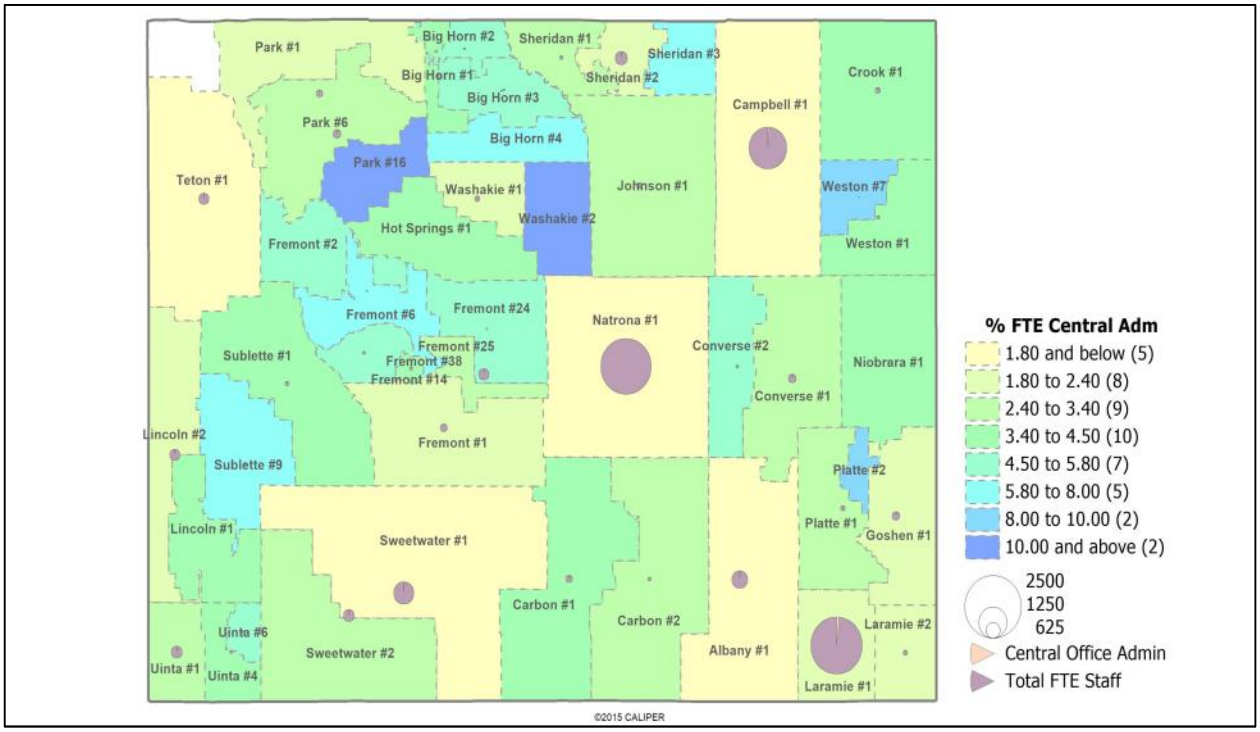


Figure 9
Bus Drivers as a Percentage of Total Staff (FTE)

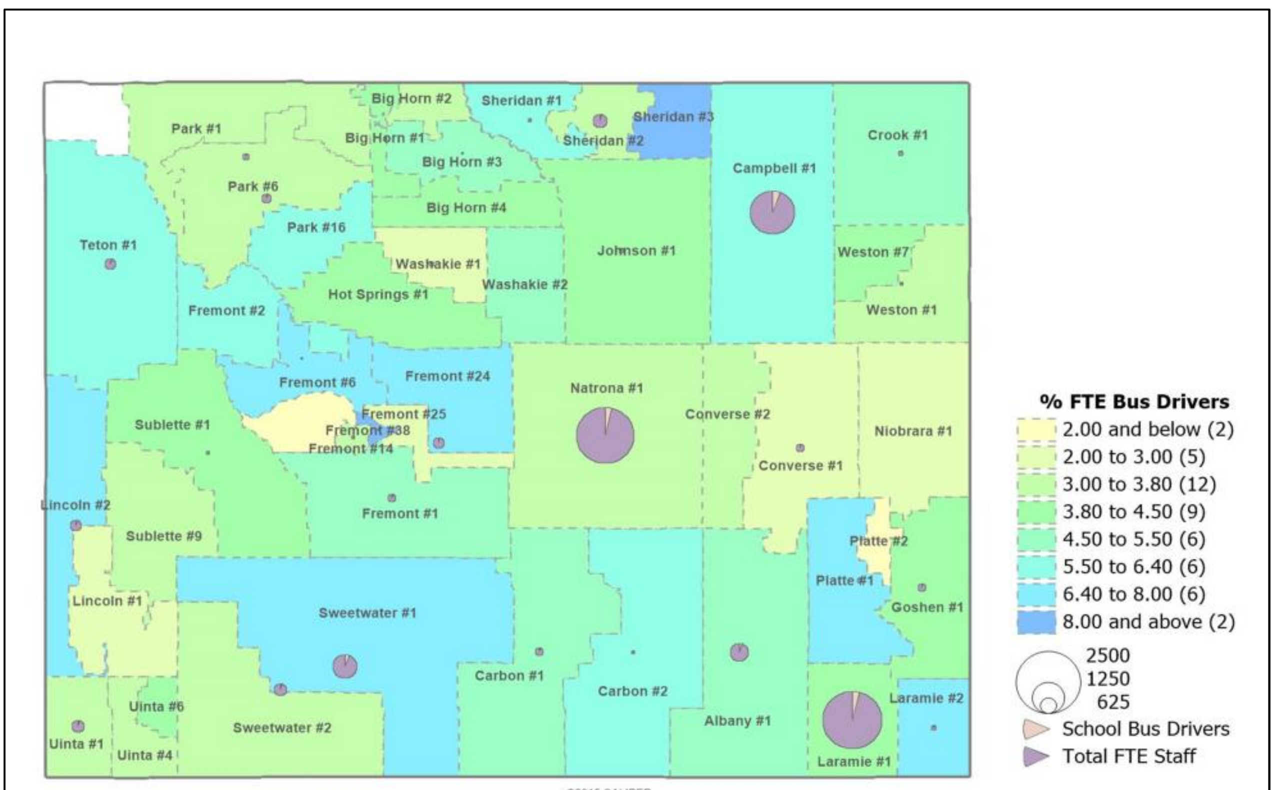
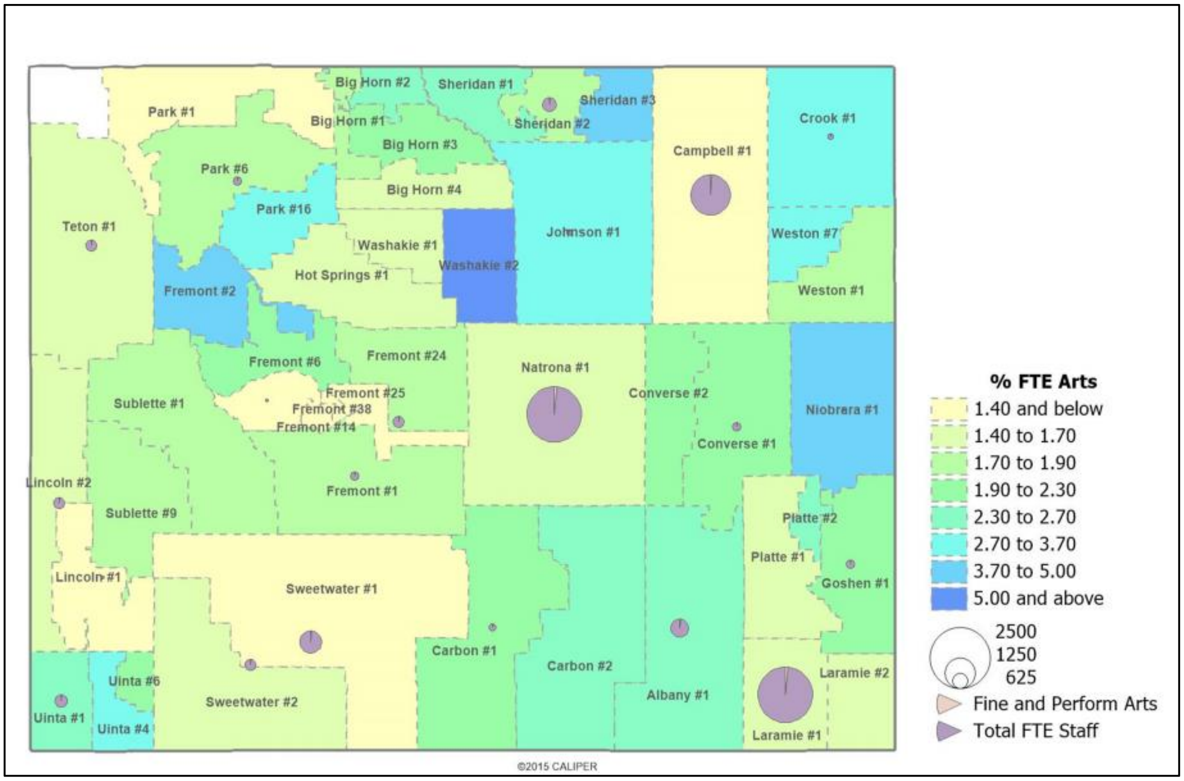


Figure 10
Fine and Performing Arts Teachers (FTE)



Consolidation also offers the possibility of balancing resources among school systems. Figure 11 illustrates the wide variation in student teacher ratios across all school districts. In some cases of adjacent school districts, one school district may have as much as twice as many students per teacher as the adjacent school district. Figure 12 illustrates similar disparities in spending per ADM.

Figure 11

Opportunities to Balance Student Teacher Ratios

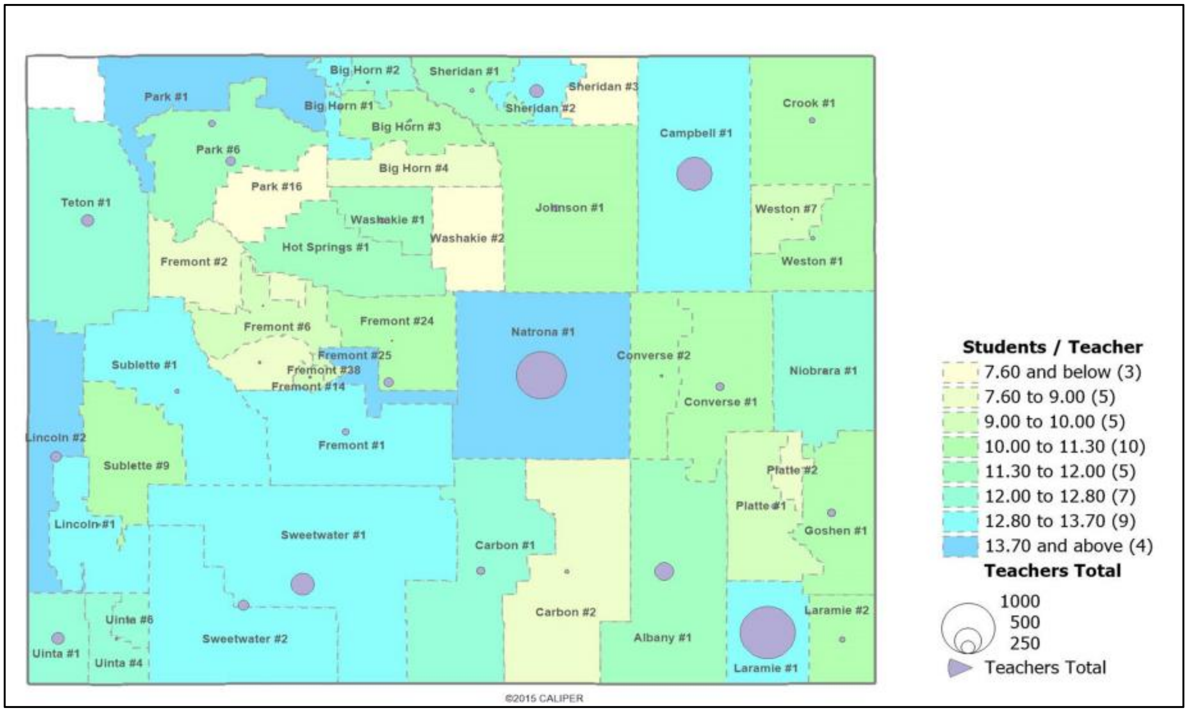
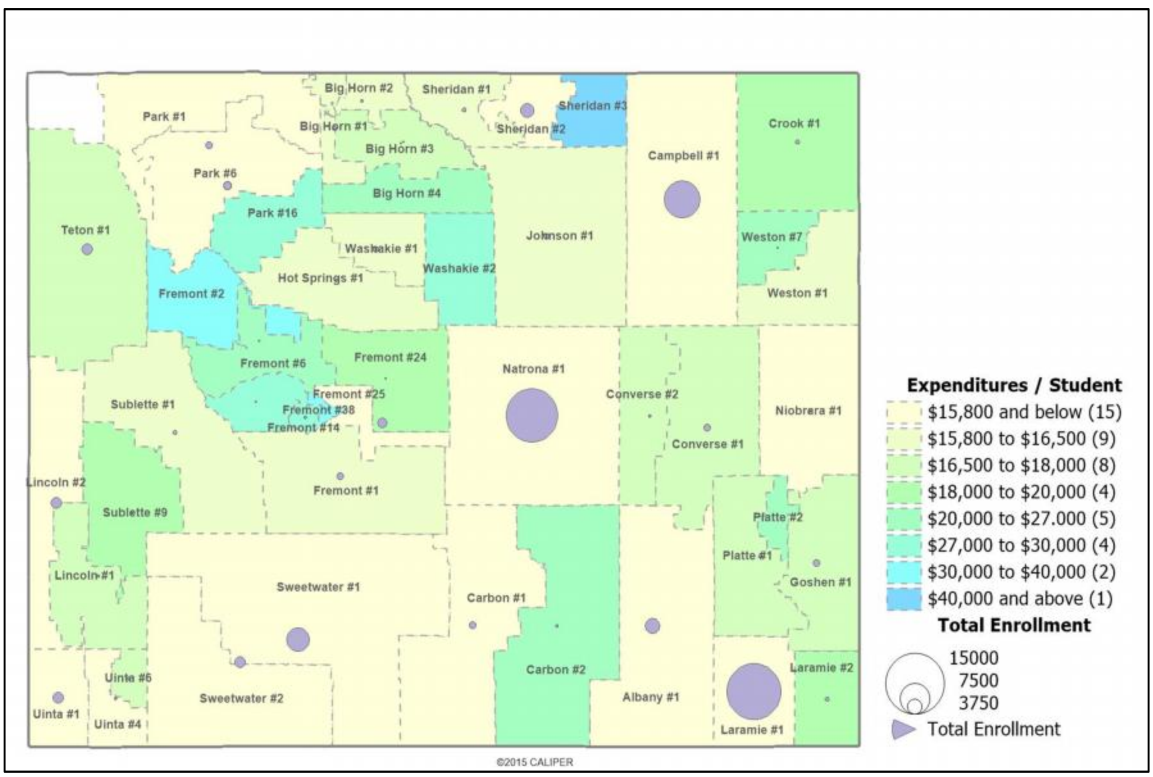


Figure 12

Expenditure per Average Daily Membership (ADM)



Offsetting Cost Increases of Consolidation

The potential savings of consolidation can be offset by a variety of potential cost increases. After consolidation, pressure can develop to increase compensation to the level of the more generous district. Figures 13 and 14 illustrate the range of teacher salaries across districts. Figure 13 shows actual average 2015-16 teacher salaries, while Figure 14 shows average salary amounts from the state's funding model, which have been adjusted by the regional cost adjustment (RCA). Both figures show that consolidation of adjacent school districts could require overcoming a differential of as much as $15,000 per teacher per year. Although one-of-a-kind positions may be eliminated, the research indicates that mid-level supervisors are frequently added. Transition costs can include the need to buy textbooks and instructional resources to implement a common curriculum. Training may be required on curriculum and instruction, process and procedures, and common software. Since consolidation frequently involves closure of a school building, transportation costs can increase. Transition costs can also include technology infrastructure and common software. District name changes can require expenses for new signage, stationery, athletic and band uniforms, and other items.

Figure 13
Equalizing Compensation
(Average Actual Teacher Salaries)

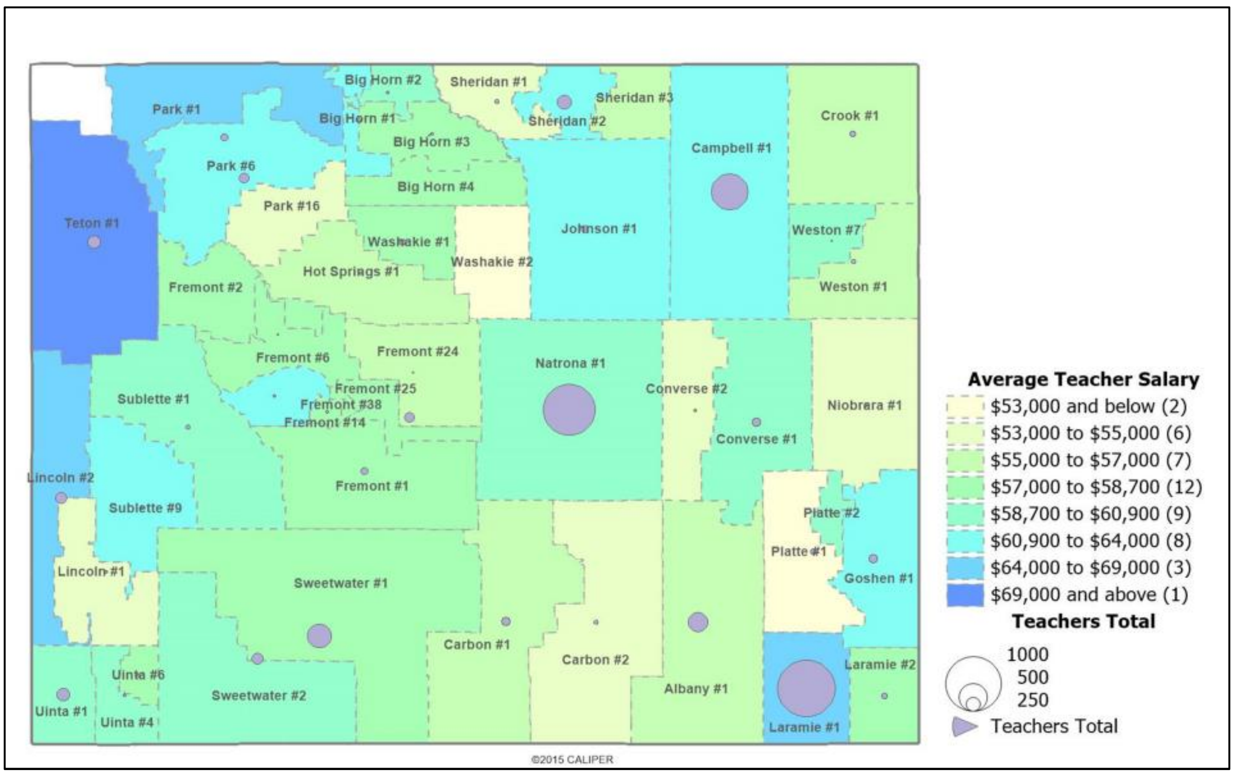
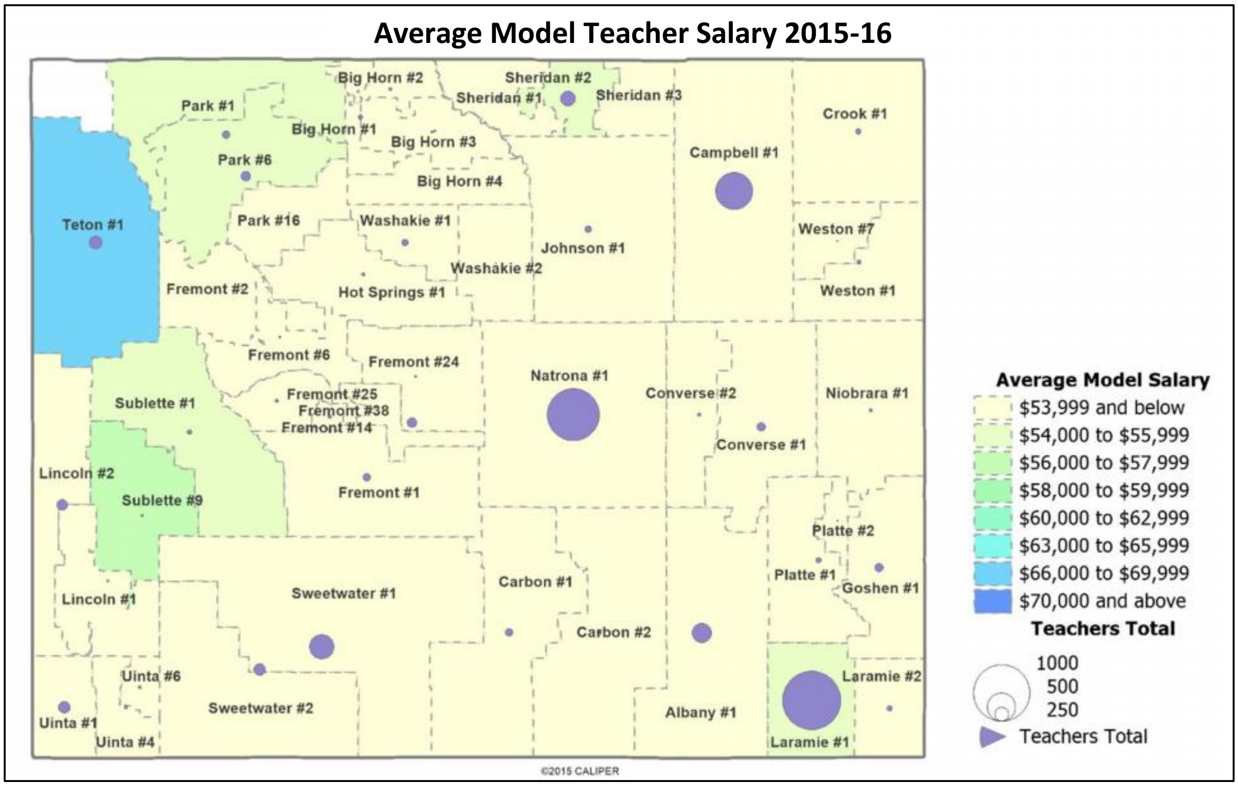


Figure 14
Equalizing Compensation
(Average Funding Model Teacher Salaries Adjusted by RCA)



Disadvantages of Consolidation

Opponents of consolidation cite the potential disadvantages of larger school systems and the advantages of smaller school systems. They state that student achievement is higher in small schools, dropout rates are lower, and more graduates enroll in postsecondary education. Again, it is important to scrutinize these conclusions due to the innumerable variables that affect these factors, not just district or school size.

Examples of Statewide Consolidation Efforts

Lessons can be learned from consolidation efforts in other states, particularly regarding incentives and disincentives used to overcome the barriers to consolidation. In Maine, districts that met consolidation guidelines but refused to merge lost two percent of state funds. Although the program has been highly controversial, it has resulted in significant consolidation. In Pennsylvania, a 2006 study identified 97 hypothetical pairings where the authors found consolidation would be possible and desirable. The recommendation focused on the potential benefits of consolidating relatively high-spending, smaller districts into lower-spending, larger districts with enrollments below 3,000 students. The study also emphasized that many key factors in a consolidation decision can be analyzed only on a case-by-case basis. The study also recognized that even if cost savings could be assured, consolidations would be controversial. In the years following the study, none of the districts identified as potential candidates for consolidation have proceeded toward consolidation. In Illinois, state aid is provided at the level of the higher district for four years. A salary differential is provided of $4,000 per certified staff member, teacher, and administrator. Some states eliminate any subsidies for sparsity or declining enrollment to force school districts to make wise budget decisions regarding staffing and facility use.

Consolidation Model

A financial model was developed to estimate the potential savings of various consolidation scenarios. The model was developed considering research conclusions regarding both the potential areas of savings and the offsetting costs of transitioning to consolidation. The model was developed to be used by others and allows consolidation of multiple districts as well as two adjacent districts. The model shows comparative data on the potential consolidation districts, including staffing ratios, grade-level structure, enrollment trends, cost per student, population density, and other factors. The model calculates the potential savings of consolidating staffing, programs, and services. It estimates offsetting transitional investments needed for many items. It also estimates future cost avoidance for school construction if the circumstances warrant. Because many district consolidations result in building-level consolidations, the results are provided with a low and high range of financial impact depending on whether school-level consolidation is possible.

The model requires users to make various assumptions. With one-of-a-kind positions (superintendents, business managers, federal programs coordinators, transportation managers, and others), an assumption must be made on whether additional mid-level administrators, supervisors, or secretarial staff are necessary, which is a common occurrence in recent school district consolidations. An assumption must be made on the salary to be provided if one position begins to serve a larger consolidated district. It is logical to assume (and supported by the current funding model) that higher salaries will be provided.

Consistent with research findings, the model adds costs for the transition to consolidation. Some of the costs occur only in the initial year, while others recur annually. Telecommunications costs may be necessary for both instructional and administrative purposes. Administrative software for financial and personnel management as well as student recordkeeping may need to be improved to accept remote data entry and reporting. Training will be needed on software and related processes, both initially and annually. Unemployment costs could occur unless the change occurs through attrition. To provide a common curriculum, instructional resources, including textbooks, multimedia, science kits, and other items, may be needed. The model allows for additional transitional items to be added.

The model also accounts for a major issue noted in the research, which is the need to level up or equalize salaries among the consolidated districts, so that teachers and other certified staff are paid at the level of the higher district. Depending on the specific circumstances of the districts considered for consolidation, this can be a significant number and offset any possible savings.

Two scenarios were developed to demonstrate the model and possible conclusions. These are included in Appendix A. The scenarios were developed using realistic information on positions and costs. Scenario 1 includes two adjacent districts with enrollments under 1,000 students each. Scenario 1 assumes elimination of one of the two positions of superintendent, business manager, facility manager, food service manager, federal programs manager, transportation manager, and personnel manager. To account for the responsibilities and workload of the eliminated positions, Scenario 1 assumes that one assistant superintendent would be necessary and that additional positions would be needed, including four central administrative secretaries and one business office accounting position. These positions would be supervised by the remaining one-of-a-kind positions. Scenario 1 has a salary differential of only $1,000 for 75 teachers.

With these assumptions, Scenario 1 has a potential annual savings estimated at approximately $150,000 if a building can be closed and approximately $40,000 if a building cannot be closed. Closing a building eliminates a principal, secretary, custodial staff, and the energy/utility expenses. But, closing a building is assumed to require more transportation costs, which offset most of the savings. Further, unless the closed building is also demolished the district may be required to continue paying for some level of maintenance over time.

Scenario 2 includes three adjacent districts with enrollments of 100, 920, and 2,500. It assumes that two of the three positions of superintendent, business manager, and facility manager would be eliminated. Due to the small size of the one district, it does not have some positions. Therefore, Scenario 2 assumes that one of two positions of food service manager, federal programs coordinator, personnel manager, transportation manager, and payroll manager are eliminated. With these reductions, Scenario 2 assumes that two assistant superintendents would be added along with three secretaries and two accounting staff.

With three districts involved, the transitional costs are proportionately higher. But, the major cost factor is the equalization of salaries due to one district having teacher salaries approximately $6,500 higher than the other two districts. This salary differential multiplied by the number of teachers results in an annual cost that more than offsets the savings from the other positions that were eliminated. Based on all assumptions made in Scenario 2, the estimated costs to consolidate would be between $375,000 and $490,000.

These two scenarios illustrate that consolidation decisions must be based on innumerable considerations specific to the districts under consideration. To facilitate those decisions, a detailed list of information requirements has been provided in Appendix B.

III. Alternatives to Consolidation

Many of the advantages of consolidation can be achieved through other methods of sharing services. Each method is discussed with examples.

Intergovernmental Cooperation Agreements

School districts can enter into intergovernmental cooperation agreements with other school districts and local government agencies. These agreements have included contracted services of school superintendents, business managers, facilities managers, payroll services, computer services, facility maintenance services, and many other types of services. In a recent example in Pennsylvania, one school district contracted to provide the services of the superintendent and business manager for another small district and those positions were eliminated in the small district. Over time, a number of New Jersey school districts have also elected to share superintendents. In another case, the services of the business office are being contracted through a Pennsylvania Intermediate Unit. A high school leases its football field from an adjacent university for home games. The same district contracts with the municipal government to mow its large grounds and maintain its storm water management facilities. A number of these services were included in the online survey, and respondents showed a strong willingness to consider sharing these services.

School-Level Consolidation

Consolidation of school districts often results in consolidating two schools into one, but other options can also provide the savings associated with closing an underutilized school. It is common to have one district pay tuition to attend a school in another district. Based on the specific circumstances, if two schools in adjacent districts (within a reasonable driving distance) consolidated, the savings in staffing, utilities, and operating costs may more than offset any additional transportation costs. Minor realignment of boundaries could also capture another district's school building, thereby providing a school consolidation opportunity.

Expansion of Regional Educational Services Agencies

Most states have regional educational service agencies providing a wide variety of services. Wyoming utilizes the BOCES model for selected residential special education programs. In another report, it was recommended that BOCES services be expanded to non-residential services for nearby districts and to the entire state via education technology. Currently, Wyoming BOCES offer some cooperative services. A compiled list of services from many states is shown in Appendix C.

Selected examples from other states provide insight on the full range of services. Appendix C includes a list of these services. In Texas, 20 Regional Education Service Centers offer approximately 350 different instructional, administrative, financial, training, and technology services, saving schools more than $60 million in 2012. The legislature commissioned a study to determine the cost savings to school districts. The average savings per school for professional development services were more than $295,000. The savings from a curriculum management system, a data management system, and internet services were greater than $210,000 per school. Direct services of providing specialized staffing services and technology support services were more than $75,000 per school. Other types of technical services provided cost savings of more than $89,000 per school. The average savings per WADA (weighted average daily attendance) were more than $380 (Rider 39 Report, 2012).

In Connecticut, services are provided for selected instructional programs, administrative services, early childhood education, community business and adult education programs, technology services, strategic planning, special education and pupil services, cooperative purchasing, public relations, academic audits, behavioral intervention strategies, and other services. In Pennsylvania, Intermediate Units offer a wide range of services including a distance learning network, healthcare consortiums, administrative software, specialized transportation, training, grant writing, financial benchmarking, property and casualty insurance programs, and many more services. Intermediate Units contract with the state to provide some of those services. Selected Intermediate Units provide specific services statewide, including special education training and technology procurement. In Montana, cooperatives services are offered for gifted and talented programs, professional development, resource sharing in equipment and personnel, and distance learning training programs.

Sharing of services for gifted and talented education provides a good example of sharing opportunities. As indicated in Appendix C, a number of states provide professional development for teachers working with gifted and talented students. In addition, instructional resources are shared. For example, expensive instructional resources, such as science kits and labs, robotics labs, mobile planetariums, and similar resources, can be shared. Through the use of affordable internet conferencing options, gifted and talented programs can collaborate among school districts on projects or share speakers. The University of Connecticut has developed the Renzulli Learning Program, a set of online lessons for gifted and talented students.

Survey results

We provided an online survey to superintendents in all school districts, with questions about shared services. Numerous examples of shared staff, services, and equipment were provided, and for each item, respondents were asked to indicate whether: 1) it is currently shared, 2) it was shared in the past, 3) they would consider sharing it, or 4) they would not share it. They were also asked to comment on barriers to sharing and to provide other examples of staff, equipment, or programs that could be shared. Results of the survey are shown in Table 1.

Table 1

Survey of Wyoming School District Superintendents on Shared Services[1]

Shared School Services	Currently Shared	Shared In The Past	Would Consider Sharing	Would Not Share
Q1. STAFFING AND RELATED BENEFITS: Single positions, district level				
Superintendent	0.00%	0.00%	20.00%	80.00%
Assistant Superintendent	0.00%	0.00%	38.89%	61.11%
Business Administrator	0.00%	0.00%	19.05%	80.95%
Curriculum Manager	0.00%	0.00%	57.14%	42.86%
Educational Foundation Manager	0.00%	0.00%	52.94%	47.06%
Facilities Manager	0.00%	0.00%	50.00%	50.00%
Federal Programs	0.00%	0.00%	65.00%	35.00%
Food Services Manager	0.00%	0.00%	52.38%	47.62%
Fundraising	0.00%	0.00%	72.22%	27.78%
Grant Writing	0.00%	0.00%	77.78%	22.22%
Personnel Manager	0.00%	0.00%	47.37%	52.63%
Public Relations	0.00%	0.00%	72.22%	27.78%
Student Services Manager	0.00%	0.00%	55.00%	45.00%
Transportation Manager	0.00%	0.00%	55.00%	45.00%
Q2. STAFFING AND RELATED BENEFITS: Other positions, district level				
Athletic Director	0.00%	0.00%	30.00%	70.00%
Cleaning Supervision, Inspection	0.00%	0.00%	63.16%	36.84%
Custodial	0.00%	0.00%	42.86%	57.14%
Facilities Maintenance	0.00%	0.00%	57.14%	42.86%

[1] Questions 3 and 13 were open-ended response questions and are not included here.

Shared School Services	Currently Shared	Shared In The Past	Would Consider Sharing	Would Not Share
Grounds keeping	4.76%	0.00%	47.62%	47.62%
Guidance Counselors	0.00%	0.00%	35.00%	65.00%
Nurses	0.00%	0.00%	45.00%	55.00%
Teachers, Computer Programming	0.00%	0.00%	73.68%	26.32%
Teachers, Distance Learning	5.26%	5.26%	78.95%	10.53%
Teachers, Foreign Languages	0.00%	0.00%	70.00%	30.00%
Teachers, Other Specialized	5.00%	0.00%	55.00%	40.00%
Teachers, Physics, Other Sciences	0.00%	0.00%	55.00%	45.00%
Teachers, Reading Specialists	0.00%	0.00%	55.00%	45.00%
Teachers, Special Education, Low Incidence	0.00%	5.00%	60.00%	35.00%
Technology Support	0.00%	0.00%	45.00%	55.00%
Tutors	0.00%	0.00%	57.89%	42.11%
Q4. SPECIALIZED SERVICES BY EMPLOYEES: Business Services				
Accounting	0.00%	0.00%	50.00%	50.00%
Contract Administration	0.00%	0.00%	68.42%	31.58%
Financial Planning	0.00%	0.00%	63.16%	36.84%
Internal Auditing	0.00%	0.00%	68.42%	31.58%
Purchasing and Bidding Services	5.00%	0.00%	70.00%	25.00%
Tax Collection	5.56%	0.00%	77.78%	16.67%
Q5. SPECIALIZED SERVICES BY EMPLOYEES: Curriculum Design and Development				

Shared School Services	Currently Shared	Shared In The Past	Would Consider Sharing	Would Not Share
Curriculum Design and Development	0.00%	0.00%	65.00%	35.00%
Q6. SPECIALIZED SERVICES BY EMPLOYEES: Food Service				
Cleaning, Regular	0.00%	0.00%	35.00%	65.00%
Cleaning, Specialized	0.00%	0.00%	50.00%	50.00%
Food Preparation	0.00%	0.00%	40.00%	60.00%
Menu Planning	5.00%	5.00%	65.00%	25.00%
Program Compliance	5.00%	5.00%	70.00%	20.00%
Q7. SPECIALIZED SERVICES BY EMPLOYEES: Facilities Management				
Construction Management	10.00%	0.00%	70.00%	20.00%
Energy Management	5.00%	0.00%	75.00%	20.00%
HVAC Maintenance	5.00%	0.00%	75.00%	20.00%
Maintenance Services, Specialized	5.00%	0.00%	70.00%	25.00%
Painting	5.00%	0.00%	70.00%	25.00%
Pest Control, Certified	5.26%	0.00%	78.95%	15.79%
Preventative Maintenance	5.00%	0.00%	70.00%	25.00%
Roofing	10.00%	0.00%	65.00%	25.00%
Q8. SPECIALIZED SERVICES BY EMPLOYEES: Personnel Administration				
Hiring	0.00%	9.52%	23.81%	66.67%
Employee Benefits Administration	4.76%	0.00%	57.14%	38.10%
Recruiting	4.76%	4.76%	52.38%	38.10%
Q9. SPECIALIZED SERVICES BY EMPLOYEES: Professional Development				
Curriculum and Instruction	0.00%	9.52%	61.90%	28.57%

Shared School Services	Currently Shared	Shared In The Past	Would Consider Sharing	Would Not Share
Management and Administration	4.76%	0.00%	52.38%	42.86%
Q10. SPECIALIZED SERVICES BY EMPLOYEES: Strategic Planning				
Strategic Planning	0.00%	5.00%	45.00%	50.00%
Program Planning and Evaluation	0.00%	5.00%	55.00%	40.00%
Q11. SPECIALIZED SERVICES BY EMPLOYEES: Technology				
Technology Planning, Instruction	0.00%	0.00%	60.00%	40.00%
Technology Planning, Infrastructure	4.76%	0.00%	61.90%	33.33%
Technology Planning, Administration	5.00%	0.00%	60.00%	35.00%
Technology Planning, Productivity	5.00%	0.00%	60.00%	35.00%
Network Support	9.52%	0.00%	47.62%	42.86%
Equipment Repair	9.52%	0.00%	57.14%	33.33%
Training	10.00%	5.00%	75.00%	10.00%
Q12. SPECIALIZED SERVICES BY EMPLOYEES: Transportation				
Driver Training	9.52%	4.76%	80.95%	4.76%
Management	0.00%	0.00%	66.67%	33.33%
Specialized Routes	0.00%	0.00%	66.67%	33.33%
Vehicle Maintenance	4.76%	0.00%	66.67%	28.57%
Bus Route Planning	0.00%	0.00%	71.43%	28.57%
Q14. Barriers to sharing an employee include:				

Shared School Services	Currently Shared	Shared In The Past	Would Consider Sharing	Would Not Share
Answer Choices	Responses			
Travel distance/time	95.24%			
Employment contract restrictions	47.62%			
Currently too busy to share	66.67%			
Service provided by a contractor	47.62%			
Service provided by someone with many other duties	66.67%			
Other (please specify)	23.81%			
Q15. EQUIPMENT SHARING: Instruction				
Science Labs	4.76%	0.00%	19.05%	76.19%
Computer Labs	4.76%	0.00%	19.05%	76.19%
Instructional Resources	0.00%	0.00%	47.62%	52.38%
Special Education	4.76%	4.76%	38.10%	52.38%
Q16. EQUIPMENT SHARING: Large Equipment				
Boom Lifts	5.26%	5.26%	68.42%	21.05%
Excavators, Backhoes	5.26%	5.26%	68.42%	21.05%
Dump Trucks	5.26%	0.00%	73.68%	21.05%
Q17. EQUIPMENT SHARING: Transportation				
Vehicle Maintenance - Lifts, Diagnostic	0.00%	0.00%	75.00%	25.00%
Q18. EQUIPMENT SHARING: Grounds keeping				
Mowing	9.52%	0.00%	42.86%	47.62%

Shared School Services	Currently Shared	Shared In The Past	Would Consider Sharing	Would Not Share
Excavating	5.00%	0.00%	65.00%	30.00%
Snow Removal	4.76%	0.00%	42.86%	52.38%
Q19. EQUIPMENT SHARING: Printing				
Printing	10.00%	5.00%	65.00%	20.00%
Q21. Barriers to sharing equipment include:				
Answer Choices	Responses			
The equipment is rented for brief periods if needed	57.89%			
Contractors are used when that equipment is needed	73.68%			
Effort required to move equipment	57.89%			
Other (please specify)	47.37%			

Other Survey Comments

The online survey allowed respondents to suggest other types of shared services or make comments on barriers to sharing services. Suggestions for sharing employees and services included special education instruction and supervision, online courses, and vocational programs, including agriculture. Comments on barriers to sharing included district-specific requirements that need undivided attention and local expertise, state reporting requirements, and calendar and scheduling conflicts.

IV. Recommendations

The primary recommendation is to use alternatives to full district consolidation because many of the advantages of consolidation are achievable without some of the additional challenges and negative consequences of consolidation. These alternatives include intergovernmental cooperation agreements among school districts, expansion of cooperative services provided through the BOCES, as well as continuation and expansion of informal sharing arrangements.

Another major recommendation is to conduct several regional summits of districts to explore the full potential of shared services. The summits should include districts that contain the most characteristics favorable to consolidation. At those summits, extensive data would be shared to stimulate creative yet realistic innovation on shared services that allow districts to become as cost effective as possible. As shown throughout this report, extensive enrollment, staffing, financial, and demographic data can be provided on maps. Prior to the summit, districts would be provided a detailed list of questions and information requests that will be important for a productive discussion and to formulate recommendations. A draft list of those items is included as Appendix B. The summits should have experienced representatives from administrations, school boards, BOCES, and selected interest groups. A skilled facilitator should be used. The specific recommendations from these summits should include a detailed cost benefit analysis and proposed implementation plan. The results of these summits should be disseminated widely.

In advance, the Consolidation Model should be run for the districts selected. The model provides a target of savings possible through full consolidation, but also provides information on savings through school-level consolidation. To understand the potential of school-level consolidation, a geographic information system (GIS) (computer mapping) should be used to locate the residence of all current students by grade level and current school attended. It would also locate the schools and the capacity of each. This geocoding of students and school capacities can then utilize the capabilities of GIS to populate the nearest students to each school as measured by driving time, not distance. It is possible that both school-level and district-level consolidation will be recommended. It is also likely that an expanded role for BOCES will be identified in detail and the cost benefit ratios can be used to understand how those services can be funded. Many districts are using computer mapping and GIS capabilities as part of their transportation routing software.

Appendix A

Consolidation Model

Two District Consolidation Example						
	District A	District B	2 District Total	Consolidated District	Savings or Cost	Notes
Comparative Information						
Population density (students per square mile)						
Enrollment	800	700	1,500	1,500		
Grade-level configuration						
Cost per student	$15,000	$17,000				
Staffing ratios						
Student:Teacher	12.5	12				
Student:School Administrator	320	233				
Central Administrators as % of Total Staff	7%	4%				
Positions (salary and benefits)						
Superintendent	1	1	2	1		In other states with county school districts or large urban districts, a superintendent is supplemented by regional superintendents overseeing 8 to 15 schools. In this example, the consolidation would result in one superintendent and an assistant remaining largely to oversee the consolidated district.
Cost	$150,000	$148,000	$298,000	$155,000	($143,000)	
Assistant Superintendent				1		
Cost				$128,000	$128,000	
Business Manager	1	1	2	1		Many of these positions supervise all support services including transportation, food service, finance, facilities, personnel administration, etc.
Cost	$120,000	$115,000	$235,000	$125,000	($110,000)	
Facility Manager	1	1	2	1		Some districts do not have these positions and the duties

Two District Consolidation Example						
	District A	District B	2 District Total	Consolidated District	Savings or Cost	Notes
Cost	$70,000	$68,000	$138,000	$75,000	($63,000)	are performed by the superintendent or business manager.
Food Service Manager	1	1	2	1		
Cost	$80,000	$70,000	$150,000	$80,000	($70,000)	
Federal Programs Coordinator	1	1	2	1		
Cost	$80,000	$70,000	$150,000	$80,000	($70,000)	
Personnel Manager	1	1	2	1		
Cost	$80,000	$78,000	$158,000	$85,000	($73,000)	
Transportation Manager	1	1	2	1		
Cost	$70,000	$68,000	$138,000	$75,000	($63,000)	
Payroll Manager	1	1	2	1		A payroll manager could oversee payroll processes in multiple districts given online software options.
Cost	$50,000	$48,000	$98,000	$55,000	($43,000)	
Central Administration Secretaries	3	3	6	10		Assumes that reduction of central administrative positions would be replaced by secretarial positions serving these functions but paid more. This depends on the extent of consolidation in other related support service positions including federal programs, facilities management, food service, transportation, etc.
Cost	$43,000	$41,000	$252,000	$48,000	$228,000	
Business Office Accounting Staff	2	2	4	5		
Cost	$55,000	$53,000	$216,000	$55,000	$59,000	
Total Staff	12	12	26	25	(1)	
Total Cost/Savings			$1,833,000	$1,613,000	($220,000)	
Other Financial Benefits of						

Two District Consolidation Example						
	District A	District B	2 District Total	Consolidated District	Savings or Cost	Notes
Consolidation						
Cost Avoidance in Construction and Maintenance Costs						Possible if excess building capacity is available and a school can be closed.
Transitional Costs to Implement Consolidation		**Initial**	**Initial Amortized 5 years**	**Recurring Annually**	**Total**	
Telecommunication		$50,000	$10,000	$10,000	$20,000	To allow remote processing of software or to offer distance learning options.
Online software for payroll, etc.		$75,000	$15,000	$10,000	$25,000	Software license for common software
Training		$50,000	$10,000	$10,000	$20,000	Training for common software
Unemployment		$100,000	$20,000		$20,000	Not applicable if implemented by attrition.
Common instructional resources		$100,000	$20,000		$20,000	May be necessary to buy common textbooks or instructional resources.
	Average Teacher Salary		**Difference**	**Teachers**	**Total**	
Equalizing Compensation: Teachers	$58,000	$59,000	$1,000	75	$75,000	Consolidating creates pressure to equalize or level up salaries to the compensation provided by the more generous school district. Calculate by average teacher salary differential X number of teachers in lower paid district.
Total					180,000	
Small School Consolidation Opportunities						

Two District Consolidation Example						
	District A	**District B**	**2 District Total**	**Consolidated District**	**Savings or Cost**	**Notes**
	School 1	**School 2**	**2 School Total**	**Consolidated Schools**	**Savings or Cost**	District consolidation may provide opportunities for school-level consolidation due to more students to distribute and more underutilized schools. One of the criteria for consolidation is declining enrollments. But, consolidation may not be possible if travel times are excessive.
Principal	1	1	2	1		
Cost	$115,000	$115,000	$230,000	$115,000	($115,000)	
Secretary	1	1	2	2		
Cost	$28,000	$26,000	$54,000	$28,000	$2,000	
Custodial Staff	3	3	6	4		
Cost	$40,000	$40,000	$240,000	$40,000	($80,000)	
Energy, if school closure					($40,000)	
Additional Transportation to Consolidated School				$120,000	$120,000	Cost of one bus is $40,000. Assumes 200 students to transport on 72 passenger buses.
				Total	($113,000)	
Summary			Highest Savings		($153,000)	Assumes small school consolidation is possible.
			Lower Savings		($40,000)	Assumes small school consolidation is not possible.

Three District Consolidation Example							
	District A	**District B**	**District C**	**3 District Total**	**Consolidated District**	**Savings or Cost**	**Notes**
Comparative Information							
Population density (students per square mile)							
Enrollment	920	3,500	100	4,520	4,520		
Grade-level configuration							
Cost per student	$17,000	$15,000	$40,000				
Staffing ratios							
Student:Teacher	12	13	6				
Student:School Administrator	153	292	100				
Central Administrators as % of Total Staff	3%	2%	8%				
Positions (salary and benefits)							
Superintendent	1	1	1	3	1		In other states with county school districts or large urban districts, a superintendent is supplemented by regional superintendents overseeing 8 to 15 schools. In this example, the consolidation would result in one superintendent and assistant superintendents remaining largely to oversee the consolidated district.
Cost	$150,000	$170,000	$120,000	$440,000	$175,000	($265,000)	
Assistant Superintendent					2		
Cost				$0	$128,000	$256,000	
Business Manager	1	1	1	3	1		Many of these positions supervise all support services including transportation, food service, finance, facilities, personnel administration, etc.
Cost	$120,000	$130,000	$110,000	$360,000	$140,000	($220,000)	

Three District Consolidation Example							
	District A	**District B**	**District C**	**3 District Total**	**Consolidated District**	**Savings or Cost**	**Notes**
Facility Manager	1	1	1	3	1		Some districts do not have these positions and the duties are performed by the superintendent or business manager.
Cost	$70,000	$68,000	$60,000	$198,000	$80,000	($118,000)	
Food Service Manager	1	1	0	2	1		
Cost	$80,000	$70,000		$150,000	$85,000	($65,000)	
Federal Programs Coordinator	0	1	0	1	1		
Cost	$80,000	$70,000		$70,000	$85,000	$15,000	
Personnel Manager	1	1	0	2	1		
Cost	$70,000	$78,000		$148,000	$85,000	($63,000)	
Transportation Manager	1	1	0	2	1		
Cost	$70,000	$68,000		$138,000	$75,000	($63,000)	
Payroll Manager	1	1	0	2	1		A payroll manager could oversee payroll processes in multiple districts given online software options.
Cost	$50,000	$48,000		$98,000	$55,000	($43,000)	
Central Administration Secretaries	3	7	1	11	14		Assumes that reduction of central administrative positions would be replaced by secretarial positions serving these functions but paid more. This depends on the extent of consolidation in other related support service positions including federal programs, facilities management, food service, transportation, etc.
Cost	$43,000	$41,000	$40,000	$456,000	$48,000	$216,000	
Business Office Accounting Staff	2	2	1	5	7		
Cost	$55,000	$53,000	$50,000	$266,000	$55,000	$119,000	
Total Staff	12	17	5	34	31	(3)	

Three District Consolidation Example							
	District A	**District B**	**District C**	**3 District Total**	**Consolidated District**	**Savings or Cost**	**Notes**
Total Cost/Savings				$2,324,000	$2,093,000	($231,000)	
Other Financial Benefits of Consolidation							
Cost Avoidance in Construction and Maintenance Costs							Possible if excess building capacity is available and a school can be closed.
Transitional Costs to Implement Consolidation			**Initial**	**Initial Amortized 5 Years**	**Recurring Annually**	**Total**	
Telecommunication			$50,000	$10,000	$10,000	$20,000	To allow remote processing of software or to offer distance learning options.
Online software for payroll, etc.			$75,000	$15,000	$10,000	$25,000	Software license for common software
Training			$50,000	$10,000	$10,000	$20,000	Training for common software
Unemployment			$100,000	$20,000		$20,000	Not applicable if implemented by attrition.
Common instructional resources			$100,000	$20,000		$20,000	May be necessary to buy common textbooks or instructional resources.
	Average Teacher Salary			**Difference**	**Teachers**	**Total**	
Equalizing Compensation - Teachers	$54,000	$61,500	$56,000	$6,500	95	$617,500	Consolidating creates pressure to equalize or level up salaries to the compensation provided by the more generous school district. Calculate by average teacher salary differential X number of teachers in lower paid district.

Three District Consolidation Example							
	District A	**District B**	**District C**	**3 District Total**	**Consolidated District**	**Savings or Cost**	**Notes**
Total						$722,500	
Small School Consolidation Opportunities							
	School 1	**School 2**		**3 School Total**	**Consolidated Schools**	**Savings or Cost**	District consolidation may provide opportunities for school-level consolidation due to more students to distribute and more underutilized schools. One of the criteria for consolidation is declining enrollments. But, consolidation may not be possible if travel times are excessive.
Principal	1	1		2	1		
Cost	$115,000	$115,000		$230,000	$115,000	($115,000)	
Secretary	1	1		2	2		
Cost	$28,000	$26,000		$54,000	$28,000	$2,000	
Custodial Staff	3	3		6	4		
Cost	$40,000	$40,000		$240,000	$40,000	($80,000)	
Energy, if school closure						($40,000)	
Additional Transportation to Consolidated School					$120,000	$120,000	Cost of one bus is $40,000. Assumes 200 students to transport on 72 passenger buses.
					Total	($113,000)	
Summary				Highest Costs (Savings)		$378,500	Assumes small school consolidation is possible.
				Lower Cost (Savings)		$491,500	Assumes small school consolidation is not possible.

Appendix B

Information Needed for Shared Services

and Consolidation Decision-Making

Table B1
Consolidation Information Needs for Districts Considering Consolidation

Category	Information Requested
Academic program	Academic program plans and planning cycle by curriculum subject and grade level
Academic program	Academic programs–list of current programs
Academic program	Class size or program size policies
Academic program	Curriculum sequence by standards and grade level
Academic program	Enrollment by course offering
Academic program	Head Start program and enrollment
Academic program	Migrant education program and enrollment
Academic program	Proposed changes in instructional programs, instructional technology
Academic program	School calendars
Academic program	Textbooks and instructional resources used in each academic program and grade level
Attendance boundaries	Current attendance boundaries for each school
Community support	Parent and community support
Demographics	Age structure/aging, household income, type of housing, etc.
Demographics	Economic changes in district
Demographics	Socioeconomic status, race, gender
Employee Relations	Benefit plan design, employee share, copays, other benefits
Employee Relations	Collective bargaining agreements

Category	Information Requested
Employee Relations	Salary and wage structure/schedules by position title
Enrollment	Enrollment by program and grade level–special education, vocational, other
Enrollment	Special education enrollment by exceptionality
Enrollment	Grade configurations by program and facility (K-5, K-6, K-8, middle, junior, or high school)
Enrollment	Enrollment by school for past five years
Enrollment projections	Birth rates
Enrollment projections	Projected increases or decreases by district and regions within district
Enrollment projections	Residential development and growth proposals
Facilities	Athletic fields and facilities
Facilities	Location and use, condition, size and capacity, grade configurations
Facilities	Maintenance capabilities–staff, equipment, vehicles, other items
Facilities	Renovation, expansion, replacement plans
Facilities	Square footage of all buildings
Financial	Contracted services–review existing contracts for all services
Financial	Debt service schedules
Financial	Property assessment values and trends by property type
Financial	Revenue per student by category
Financial	Revenue stability for each revenue type
Financial	Three-year financial forecast revenues, expenditures, surplus/deficit
Organizational structure	Organization charts
Planning	Capital improvement plans
Planning	Strategic plans

Category	Information Requested
Staffing	Staffing by position title, grade level, and academic program
Staffing	Staffing ratios–students per staff member for all positions
Staffing	Staffing stability or turnover rates
Student achievement	Graduation rates, dropout rates
Student achievement	Student achievement measures–test scores, other measures
Student activities	Athletic programs–sports by grade level
Student activities	Extracurricular programs
Student activities	Intramural programs
Student information	For each student–address, grade level, school attended to allow geocoding/computer mapping
Technology	Administrative software (program and version), financial, personnel administration
Technology	Curriculum management software
Technology	Infrastructure and technical support
Technology	Other administrative software programs
Technology	Student information system software
Technology	Support services software-facilities management, transportation management, other
Transportation	Bus routes and utilization

Appendix C

Examples of Shared Services

Table C1
Examples of Shared Services

State	Category	Service/Product
Connecticut	Administrative Support	Academic audits
Texas	Administrative Support	Accountability monitoring
Texas	Administrative Support	Accountability turnaround team
Texas	Administrative Support	Administrative appraisal training
Texas	Administrative Support	Agency partnerships
Texas	Administrative Support	Background checks
Texas	Administrative Support	Bridging the Leadership Team Institute
Connecticut	Administrative Support	Building audits
Texas	Administrative Support	Bully prevention
Texas	Administrative Support	Campus improvement team training
Texas	Administrative Support	Commissioner's Rule Review Process
Texas	Administrative Support	Communities in Schools
Texas	Administrative Support	Community resource coordination groups
Texas	Administrative Support	Compliance services
Connecticut	Administrative Support	Conference and event management
Connecticut	Administrative Support	Cooperative purchasing
Texas	Administrative Support	Crisis management
Connecticut	Administrative Support	Crisis training
Connecticut	Administrative Support	Data management for administration
Connecticut	Administrative Support	Database development

State	Category	Service/Product
Texas	Administrative Support	Education law
Connecticut	Administrative Support	Emergency response
Texas	Administrative Support	High school redesign and restructuring
Connecticut	Administrative Support	Human resources management
Texas	Administrative Support	Legal framework
Connecticut	Administrative Support	Meeting facilitation services
Texas	Administrative Support	Migrant shared service arrangements
Texas	Administrative Support	Non-education community-based support services
Texas	Administrative Support	Open records requests
Texas	Administrative Support	Parent complaints
Texas	Administrative Support	Parent involvement
Texas	Administrative Support	Parent training
Texas	Administrative Support	Private nonprofit shared service arrangements
Connecticut	Administrative Support	Program design, development, evaluation
Texas	Administrative Support	Promotion/retention laws
Texas	Administrative Support	Regional emergency and mass communications services
Texas	Administrative Support	Safety audits
Texas	Administrative Support	School improvement program
Texas	Administrative Support	State waivers applications
Texas	Administrative Support	Strategic and systemic planning
Texas	Administrative Support	Texas records exchange system
Texas	Administrative Support	Title I shared service arrangement
Connecticut	Administrative Support	Transportation services
Texas	Administrative Support	Turnaround teams
Connecticut	Adult Education	Adult education courses

State	Category	Service/Product
Texas	Assessment Services	Adolescent literacy academies
Texas	Assessment Services	Alternative assessment
Texas	Assessment Services	Assessment
Texas	Assessment Services	Assessment creation and support
Texas	Assessment Services	Development and appraisal system
Texas	Assessment Services	Diagnostician support
Texas	Assessment Services	Educational assessment
Texas	Assessment Services	English language proficiency assessment
Texas	Assessment Services	Language proficiency assessment
Texas	Assessment Services	Math and science diagnostic system
Texas	Assessment Services	Middle school fluency assessment
Texas	Assessment Services	Performance-based monitoring
Texas	Assessment Services	Reading proficiency tests in English
Texas	Business Services	Business information management systems
Texas	Business Services	Business manager services
Texas	Business Services	Business services for school districts
Montana	Business Services	Collective purchasing of software
Texas	Business Services	Cooperative purchasing networks
Texas	Business Services	Financial Integrity Rating Services
Texas	Business Services	Printing services
Texas	Business Services	School finance support for school districts
Connecticut	Communication Services	Communications training and support
Connecticut	Communication Services	Desktop publishing support/training
Connecticut	Communication Services	Document review
Connecticut	Communication Services	Marketing materials design/production

State	Category	Service/Product
Connecticut	Communication Services	Media consultation
Connecticut	Communication Services	Public relations planning and campaigning
Connecticut	Communication Services	Translation services
Pennsylvania	Cooperative Purchasing	Healthcare consortium
Pennsylvania	Cooperative Purchasing	Technology procurement
Pennsylvania	Cooperative Purchasing	Workers' compensation insurance consortium
Texas	Counseling	College and career readiness for all initiative
Texas	Counseling	Counselor supports
Texas	Counseling	Crisis prevention intervention
Texas	Counseling	Guidance/counseling
Texas	Direct Services	Counseling, library, and nursing services
Texas	Direct Services	Federal program director services
Texas	Direct Services	Hardware service and repair
Connecticut	Early Childhood Education	Continuous quality improvement
Connecticut	Early Childhood Education	Local early childhood councils
Connecticut	Early Childhood Education	Preschool curriculum, assessment
Connecticut	Early Childhood Education	Universal access to preschool
Texas	Food Service	Child nutrition services
Texas	Food Service	Food services–commodity processing
Texas	Food Service	Food services–cooperative purchasing
Texas	Food Service	National School Lunch Program
Texas	Food Service	Nutrition
Texas	Food Service	School meal initiative and menus
Texas	Grant Administration	Carl Perkins Grant shared services arrangement
Texas	Grant Administration	Discretionary grants

State	Category	Service/Product
Texas	Grant Administration	Fitness Now grant
Texas	Grant Administration	Grant management
Connecticut	Grant Administration	Grant procurement, writing, evaluation
Texas	Grant Administration	Grants
Connecticut	Grant Administration	Grants development and management
Texas	Grant Administration	Outreach grant
Texas	Grant Administration	School Improvement Grants (SIGs)
Texas	Instructional Services	Academic Excellence Indicator System
Texas	Instructional Services	Accelerated curriculum
Texas	Instructional Services	Accommodations in instruction and assessment
Texas	Instructional Services	Adopted materials–textbooks
Texas	Instructional Services	Adult basic education (GED and ESL)
Texas	Instructional Services	Adult education
Texas	Instructional Services	Advanced academics
Texas	Instructional Services	Alternative education program
Texas	Instructional Services	Anger management
Texas	Instructional Services	Authentic learning and assessment
Texas	Instructional Services	Behavior/classroom/discipline management
Texas	Instructional Services	Bilingual education monitoring
Texas	Instructional Services	Bilingual/English as a second language
Texas	Instructional Services	Career clusters
Texas	Instructional Services	Charter schools
Texas	Instructional Services	Curriculum design and development services
Connecticut	Instructional Services	Curriculum development
Texas	Instructional Services	Data digs

State	Category	Service/Product
Texas	Instructional Services	Dual credit classes-scheduling and video conferencing
Texas	Instructional Services	Dual language support
Texas	Instructional Services	Early childhood intervention
Texas	Instructional Services	Early childhood transition
Texas	Instructional Services	Early Head Start
Texas	Instructional Services	Early reading instruments
Texas	Instructional Services	Educational materials
Texas	Instructional Services	ELA journals
Texas	Instructional Services	ELA Transition documentation
Texas	Instructional Services	Fine arts
Texas	Instructional Services	GED–General Educational Development
Texas	Instructional Services	Geometry EOC Success
Texas	Instructional Services	Gifted and talented
Texas	Instructional Services	GPC–Grade Placement Committee
Texas	Instructional Services	Grade Advancement (SSI)
Texas	Instructional Services	Graduation requirements
Texas	Instructional Services	Head Start
Texas	Instructional Services	Highly qualified
Texas	Instructional Services	Homeless
Texas	Instructional Services	Immigrant support
Texas	Instructional Services	Instructional materials allotment
Texas	Instructional Services	Kindergarten Readiness System
Texas	Instructional Services	Library connection
Texas	Instructional Services	Library consortium
Texas	Instructional Services	Library/librarian support

State	Category	Service/Product
Texas	Instructional Services	Linguistic accommodation test
Texas	Instructional Services	Literacy initiative
Texas	Instructional Services	Math initiative
Texas	Instructional Services	Middle school student algebra readiness
Texas	Instructional Services	Migrant education information
Texas	Instructional Services	Migrant shared service arrangements
Texas	Instructional Services	Military child education coalition
Texas	Instructional Services	Reading Recovery
Montana	Instructional Services	Resource sharing–physical
Texas	Instructional Services	Resources for teaching (creative corner, copy center, print shop)
Texas	Instructional Services	REVEAL data warehouse dropout early prevention
Texas	Instructional Services	RIF–Reading is Fundamental
Texas	Instructional Services	Sheltered instruction
Texas	Instructional Services	Six Traits Writing
Texas	Instructional Services	Spanish language arts
Texas	Instructional Services	Textbook coordination
Texas	Instructional Services	Textbook viewing room
Texas	Instructional Services	Transition planning-high school
Texas	Instructional Services	Vocational work study program
Texas	Other Services	Disproportionate representation
Texas	Other Services	Dropout recovery program
Connecticut	Other Services	Magnet school management
Texas	Other Services	Paternity awareness
Texas	Other Services	Pregnancy education and parenting
Texas	Other Services	Scholarship resources

State	Category	Service/Product
Texas	Other Services	School health
Texas	Other Services	School Reach
Texas	Other Services	School readiness integration
Texas	Other Services	Sex education
Texas	Other Services	Suicide prevention
Texas	Other Services	Teacher of the year
Texas	Other Services	Universal screener
Texas	Personnel Administration	Educator placement service
Texas	Personnel Administration	Human resource assistance
Texas	Personnel Administration	Job fairs
Montana	Personnel Administration	Resource sharing–human
Connecticut	Planning, systemic improvement	Community conversations
Connecticut	Planning, systemic improvement	Conflict management
Connecticut	Planning, systemic improvement	Curriculum planning and development
Connecticut	Planning, systemic improvement	Facilitator training
Connecticut	Planning, systemic improvement	Long range planning
Connecticut	Planning, systemic improvement	Meeting management
Connecticut	Planning, systemic improvement	Organizational design
Connecticut	Planning, systemic improvement	School board development
Texas	Products, technology	CSCOPE curriculum management systems

State	Category	Service/Product
Texas	Products, technology	ERP systems (iTCCS)
Texas	Products, technology	ERP systems (TxEIS)
Texas	Products, technology	Interactive TV
Texas	Products, technology	Internet filtering
Texas	Professional Development	Alternative certification programs
Texas	Professional Development	Beginning teacher induction and mentoring
Texas	Professional Development	Board member training
Connecticut	Professional Development	Certification support for Speech Language
Connecticut	Professional Development	Character education
Montana	Professional Development	Common core subjects
Connecticut	Professional Development	Community learning strategies and activities
Connecticut	Professional Development	Continuing education-special education specialists
Connecticut	Professional Development	Co-teaching strategies
Texas	Professional Development	CPR training
Texas	Professional Development	Curriculum leadership for principals
Connecticut	Professional Development	Differentiated instruction
Connecticut	Professional Development	Early intervention strategies
Texas	Professional Development	First year teacher support
Montana	Professional Development	Gifted and talented program design and development
Texas	Professional Development	Gifted and talented teacher training
Montana	Professional Development	Homeless
Montana	Professional Development	Indian education
Texas	Professional Development	Instructional coaching
Texas	Professional Development	Instructional leadership development
Texas	Professional Development	Leadership development

State	Category	Service/Product
Connecticut	Professional Development	Master coaching-administration and teachers
Texas	Professional Development	Math coaching academy
Texas	Professional Development	Mentor teacher training
Texas	Professional Development	Mentoring for teachers and administrators
Connecticut	Professional Development	Multiculturalism and diversity
Texas	Professional Development	New teacher orientation and training
Texas	Professional Development	Online expert training
Texas	Professional Development	Online professional development
Texas	Professional Development	Paraprofessional training
Texas	Professional Development	Parent training
Texas	Professional Development	Pathway for Emerging Leaders Academy
Connecticut	Professional Development	Performance task development
Texas	Professional Development	Principal excellence program
Texas	Professional Development	Principal mentoring
Texas	Professional Development	Professional development appraisal system
Texas	Professional Development	Regional math collaborative
Texas	Professional Development	Regional science collaborative
Connecticut	Professional Development	Response to intervention
Connecticut	Professional Development	Responsive classroom
Texas	Professional Development	School board member training
Texas	Professional Development	Superintendent academy
Texas	Professional Development	Teacher aide training
Texas	Professional Development	Teacher appraisal
Texas	Professional Development	Teacher certification
Texas	Professional Development	Teacher effectiveness

State	Category	Service/Product
Texas	Professional Development	Teacher job network
Montana	Professional Development	Technology
Connecticut	Professional Development	Technology applications in the classroom
Connecticut	Professional Development	Technology integration
Connecticut	Professional Development	Technology plan development and evaluation
Montana	Professional Development	Title IX
Connecticut	Professional Development	Training for para-professionals
Texas	Professional Development	Training for principals
Texas	Professional Development	Training for superintendents
Connecticut	School improvement	Classroom walk-throughs
Connecticut	School improvement	Data decision-making–data teams, data walls
Connecticut	School improvement	Educational leadership
Connecticut	School improvement	Effective teaching strategies
Connecticut	School improvement	High school redesign and restructuring
Connecticut	School improvement	Survey development
Connecticut	School improvement	Systemic organizational change and design
Texas	Special Education	Adapted literature/books on tape library
Texas	Special Education	Adapted physical education
Texas	Special Education	ADHD
Texas	Special Education	ARD/IEP
Texas	Special Education	Assistive technology/lending libraries
Texas	Special Education	At risk/dropout prevention
Texas	Special Education	Auditory impairment
Texas	Special Education	Autism spectrum disorder
Connecticut	Special Education	Behavioral intervention strategies

State	Category	Service/Product
Texas	Special Education	Career day transition for SPED students
Texas	Special Education	Certified orientation and mobility specialist
Texas	Special Education	Child Find services
Texas	Special Education	Deaf education certification program
Texas	Special Education	Deaf services
Connecticut	Special Education	Design and facilitate inclusion programs
Texas	Special Education	Dyslexia
Texas	Special Education	Early childhood education
Texas	Special Education	Emotional Disturbance
Texas	Special Education	Evaluation for special education eligibility
Texas	Special Education	Facilitated IEP technical assistance
Texas	Special Education	Hearing screening training certification
Texas	Special Education	Inclusion
Texas	Special Education	Intellectual disabilities
Texas	Special Education	Learning disability
Texas	Special Education	Low incidence disabilities
Texas	Special Education	Multi-cultural issues and disabilities
Texas	Special Education	Occupational therapy–technical assistance and CEUs
Texas	Special Education	Orthopedic impairment
Texas	Special Education	Other health impairment
Texas	Special Education	Physical therapy
Texas	Special Education	Physical therapy technical assistance
Texas	Special Education	Positive behavioral interventions and support
Texas	Special Education	Preschool programs for children with disabilities
Texas	Special Education	Residential special education facilities

State	Category	Service/Product
Texas	Special Education	Response to intervention
Texas	Special Education	Special education compliance
Texas	Special Education	Special education funding
Texas	Special Education	Special education monitoring
Pennsylvania	Special Education	Special education program management
Pennsylvania	Special Education	Special education training
Texas	Special Education	Speech and language pathology
Texas	Special Education	Traumatic Brain Injury
Texas	Special Education	Visual impairment
Texas	Special Education	Visually impaired orientation and mobility services
Texas	Special Education	Visually impaired teacher services
Texas	Technical Services	Classroom teacher support
Texas	Technical Services	Curriculum support
Texas	Technical Services	Low performing district support
Texas	Technical Services	Network and infrastructure services
Texas	Technical Services	Special education support
Pennsylvania	Technology Services	Administrative software-financial and personnel administration
Texas	Technology Services	Campus snapshot
Connecticut	Technology Services	Collaborative technology grant proposals
Connecticut	Technology Services	Collective purchasing of software
Texas	Technology Services	Computer cooperative
Texas	Technology Services	Content filtering services
Texas	Technology Services	Data backup solution
Texas	Technology Services	Data management for curriculum assessment
Texas	Technology Services	Data processing/information management

State	Category	Service/Product
Texas	Technology Services	Data validation monitoring
Texas	Technology Services	Desktop computer support
Texas	Technology Services	Digital media production
Texas	Technology Services	Disaster recovery services
Texas	Technology Services	Disaster recovery/data backup
Texas	Technology Services	Discovery education/streaming services/video
Texas	Technology Services	District snapshot
Texas	Technology Services	District technology plans
Texas	Technology Services	E-grant management
Texas	Technology Services	Email hosting
Texas	Technology Services	E-Rate
Texas	Technology Services	Firewall services
Texas	Technology Services	Future is Now classroom
Texas	Technology Services	Help desk ticketing services
Texas	Technology Services	Instructional technology
Texas	Technology Services	Instructional TV equipment purchasing, support, troubleshooting
Texas	Technology Services	Internet access
Texas	Technology Services	Internet broadband
Texas	Technology Services	Internet equipment purchasing, support, troubleshooting
Texas	Technology Services	Internet filtering
Texas	Technology Services	Internet safety
Texas	Technology Services	Local area network support
Texas	Technology Services	Mobile application services
Texas	Technology Services	Moodle

State	Category	Service/Product
Texas	Technology Services	Netstart–website software for districts
Texas	Technology Services	NovaNet consortium
Texas	Technology Services	Online storage services
Connecticut	Technology Services	Promoting technology best practices
Texas	Technology Services	Public education information management system
Texas	Technology Services	Router maintenance
Texas	Technology Services	Satellite downlinks
Texas	Technology Services	Server administration
Texas	Technology Services	SPAM filtering services
Texas	Technology Services	Streaming video
Texas	Technology Services	Student information management system
Connecticut	Technology Services	Summer technology institutes
Connecticut	Technology Services	Technology audits
Texas	Technology Services	Technology integration
Texas	Technology Services	Technology planning
Texas	Technology Services	Texas virtual school network
Texas	Technology Services	Time and effort software
Texas	Technology Services	Video conference technical support
Texas	Technology Services	Video conferencing
Texas	Technology Services	Videoconferencing field trip facilitation
Texas	Technology Services	Voice over IP solutions
Texas	Technology Services	Web hosting
Texas	Technology Services	Wireless internet consortium
Texas	Transportation	Bus audits
Texas	Vocational Education	Career/technical education

References

Connecticut Alliance of Regional Education Service Centers. *RESC Alliance Services*. Retrieved November 11, 2017 http:/www.rescalliance.org/instructional.html. November 11, 2017.

Duncombe, W. & Yinger, J. (2015). *Does School District Consolidation Cut Costs?* Syracuse, New York: Center for Policy Research.

Howley, C., Johnson, J., & Petrie, J. (2011), *Consolidation of Schools and Districts: What the Research Says and Means*. Boulder, Colorado: National Education Policy Center.

Standard and Poors School Evaluation Service. (2007). S*tudy of the Cost-Effectiveness of Consolidating Pennsylvania School Districts*. New York: Author.

Texas System of Education Service Centers. (2012). *Rider 39 Report: Cost Savings Experienced by School Districts and Charter Schools*. Austin, TX: Author.