THE 2020 RECALIBRATION OF WYOMING'S EDUCATION RESOURCE BLOCK GRANT MODEL

Final Report

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Introduction and Overview

INTRODUCTION

This report represents the fourth time Picus Odden & Associates has used our Evidence-Based (EB) Model to assist the Wyoming Legislature's recalibrating the state's school funding model. The process of recalibrating the funding system must be done at least every five years to meet the requirements of Wyoming Statute. The work reported here builds on and extends the recalibration work Picus Odden & Associates conducted for Wyoming in 2005, 2010, and 2015.

As with our past recalibration work in Wyoming (and in all other states where we work), we start with the EB model we have developed over a period of approximately 25 years and have used to help determine school finance adequacy in some 25 states. We then tailor the model to the unique circumstances in each state. Wyoming policymakers, educators and education stakeholders are familiar with how the EB works, and we have had the privilege of working with many people who are dedicated to providing the best possible education for Wyoming's PreK-12 students.

While similar to previous recalibration efforts, this project comes at a very challenging time for Wyoming. The COVID-19 pandemic changed the way many schools operated at the end of the 2019-20 school year and will undoubtably impact how education is provided to students at the beginning of the current (2020-21) school year and possibly well into the future. At the same time, Wyoming faces severe reductions in state revenue. The pandemic has potential long-term implications for how the basket of education goods and services are provided. The revenue declines have challenged the Legislature. And by extension, our team of researchers have searched for the most cost-effective options to provide the elements of the basket of goods and services.

In our three previous studies, we identified all of the elements to adequately fund a program that met the State's educational needs and enabled all of the state's schools to provide the educational basket of goods and services as required by Wyoming statue, including the recently added algorithmic thinking and computer science. In 2005 we developed a revised funding approach for Wyoming based on our firm's EB Model of school finance adequacy. The funding model currently in place in Wyoming relies on a majority of the EB Model's recommendations, with some differences enacted by the Legislature during its 2006 and subsequent sessions. In some instances, the Legislature funded components of the model differently than levels recommended in the EB Model. In most instances (e.g., class size), this "legislative grace" provided more resources than the EB Model, but in some instances (e.g., instructional facilitators) it provided less funding. Over time, this approach led to discussions of the "cost-based" or "EB Model," which reflects all of our Wyoming EB recommendations, and the "Legislative Model," which reflects the decisions made by the Legislature and enacted into law. Throughout this report, we refer to the "EB Model" or the "Legislative Model" to reflect those differences.

In 2010, Picus Odden & Associates conducted an initial desk audit and participated in the further recalibration of the Model. At the same time, the Legislature contracted for several additional studies, first, to enhance the way the Model was adjusted for inflation and second, to develop a more sophisticated external cost adjustment (ECA) process to enhance the accuracy of cost estimates of the Model's elements. The Legislature also undertook several studies to create a better understanding of the labor market for school districts and the market position of model and actual school districts' salaries in Wyoming. In 2011, the Legislature also contracted for a review of the hedonic wage index (HWI) and the regional cost adjustment (RCA) used in the Model, but never enacted the findings from that study, choosing instead to use the HWI developed as part of the 2005 recalibration.

In our 2015 recalibration we again reviewed all of the elements of the EB model and the components of the Legislative Model as it was enacted and used in school year 2014-15 (Odden & Picus, 2015). The 2015 recalibration considered each element of the Legislative Model, reviewed current educational research related to each element and made a recommendation as to whether or not the Legislature should consider recalibrating that element.

This recalibration report uses the 2015 analysis as its starting point and adds to the discussion of each resource element the findings from further research that has been conducted since 2015. There are three reasons why we have recommended an element be recalibrated: 1) where resource elements in the EB model differ from the current Legislative Model; 2) EB resource elements where our recommendations have changed since 2015; and 3) EB elements where research suggests the element should be updated.

As part of the development of the 2020 EB model, we held 18 professional judgment panels with Wyoming educators between June 15 and July 27. A total of 148 individuals participated in the panels and are identified in Appendix A. The findings and recommendations from these panels – which were used to test the EB recommendations and how they work in Wyoming – are included in each of the individual element descriptions located in Chapter 3.

We have also conducted several additional studies of items not currently in the funding model, including PreK, school safety, transportation, food services, and Special Education. PreK and school safety are included in Chapter 4 of this report, Transportation and Food Services are included as elements 24 and 25 respectively in Chapter 3 of this report. Special Education is the topic of a separate document prepared by the District Management Group (2020), which worked with Picus Odden & Associates on this recalibration.

In addition to recalibrating all of the EB elements, we undertook, with our partner Activate Research, case studies of ten schools that have made substantial improvements in or consistently produced high levels of student performance over the last three to five years (see Hoyer, 2020). The findings from these case studies are also provided as a separate document.

WYOMING SCHOOL FUNDING OVER THE PAST FIFTEEN YEARS

Table 1.1 displays operating revenues for Wyoming's public schools, on both a total and per pupil basis, for school years (SY) 2000-01 to SY 2018-19. In the 15 years from 2003-04 to 2018-19, operating revenues per pupil grew from $10,629 to $18,610, an increase of $7,981 or 75.1 percent, substantially greater than inflation.

Table 1.1 also shows a notable increase in general and special fund revenues from SY 2005-06 to SY 2006-07. This jump is due largely to the 2005 recalibration, which increased funding for SY 2006-07. Operating revenues per pupil increased by $2,934 between SY 2005-06 and SY 2006-07.

The increase in the special revenue fund in SY 2010-11 and decline in the following years is primarily a result of one-time federal stimulus and Education Jobs revenues provided to all states during the 2008-09 national recession. Since districts received federal funding on a reimbursement basis and the dollars were accounted for in the year expended; those revenues impacted to some extent SY 2011-12 and SY 2012-13, but were gone by SY 2012-13.

Table 1.1 shows that over the past decade the State has provided large increases in funding for its schools, particularly the funding increase resulting from the 2005 recalibration. It would be reasonable to expect a significant improvement in student performance after this notable funding gain. As shown in Chapter 2, data from the National Assessment of Education Progress (NAEP) suggest improvements in student performance have not grown at the same pace as the growth in revenues for education in Wyoming.

Table 1.1 Wyoming K-12 Operating Revenues: School Years 2000-01 to 2018-19

School Year	General Fund ($)	Special Revenue ($)	Enterprise Funds ($)	Total Operating Revenues ($)	Wyoming K-12 Enrollment	Operating Revenue per Student ($)
2000-01	664,657,985	68,247,116	21,125,316	754,030,417	89,531	8,422
2001-02	717,117,801	91,829,655	22,781,074	831,728,530	87,897	9,463
2002-03	768,273,957	104,543,156	22,401,473	895,218,586	86,117	10,395
2003-04	759,619,270	116,951,880	24,154,765	900,725,915	84,741	10,629
2004-05	840,452,300	164,845,079	25,579,977	1,030,877,356	83,772	12,306
2005-06	898,107,584	121,829,031	26,464,065	1,046,400,681	83,705	12,501
2006-07	1,115,203,990	161,682,086	29,363,846	1,306,249,921	84,629	15,435
2007-08	1,180,793,267	158,145,034	31,249,982	1,370,188,282	85,578	16,011
2008-09	1,193,970,430	174,995,822	37,904,245	1,406,870,497	86,519	16,261
2009-10	1,248,998,873	174,398,888	38,475,856	1,461,873,616	87,420	16,722
2010-11	1,274,738,890	212,112,990	36,257,835	1,523,109,715	88,165	17,276
2011-12	1,331,844,178	195,130,458	37,928,803	1,564,903,439	89,476	17,490
2012-13	1,370,360,482	182,762,763	37,539,177	1,590,662,422	90,993	17,481

School Year	General Fund ($)	Special Revenue ($)	Enterprise Funds ($)	Total Operating Revenues ($)	Wyoming K-12 Enrollment	Operating Revenue per Student ($)
2013-14	1,377,782,164	177,626,925	37,376,035	1,592,785,123	92,218	17,272
2014-15	1,421,470,400	192,850,164	37,593,786	1,651,914,350	93,303	17,705
2015-16	1,486,181,081	187,278,558	38,268,594	1,711,728,233	94,002	18,209
2016-17	1,488,488,910	184,757,295	39,110,805	1,712,357,010	93,261	18,361
2017-18	1,519,060,779	155,912,416	37,980,778	1,712,953,973	92,976	18,424
2018-19	1,519,893,402	173,102,060	38,282,464	1,731,277,927	93,029	18,610

Source: WDE; WDE 601 WISE Annual District Report and WDE 684 WISE TCS Fall Data
Note: Does not include 85xxx - miscellaneous revenue sources (transfers, bond issuances, sale of assets and contributed capital transfers)

Chapter 2
The School Improvement Model

The intent of the Wyoming K-12 Funding Model is to identify the amounts necessary for the Legislature to appropriate funding for the State's basket of educational goods and services and then to provide each school district with adequate funds to provide that basket, providing each student an equal opportunity to meet Wyoming's student performance standards. Although a direct linkage between funding and student performance has not yet been identified, the Wyoming K-12 Funding Model is designed to compute adequate resources to provide all students with robust opportunities to meet Wyoming student content and performance standards. Regardless of whether high school graduates go on to college or enter the workforce, today's global, knowledge-based economy requires a similar set of skills and expertise of each graduate.

It should be noted that Wyoming's basket of educational goods is comprehensive. Currently, the basket includes:

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

To provide this basket, schools must offer a comprehensive curriculum to all students and the EB model is designed to just that. Furthermore, as the 2017 study by Augenblick, Palaich and Associates (2017) concluded, this set of curriculum standards is similar to and no more comprehensive than curriculum standards in surrounding states and other high performing states. Although there are overlaps in the twelve components of the basket – reading is key to learning in all subjects, and some Career Technical programs can in some instances cover math and science – it is not possible to combine two of the main components of the basket – such as math and science – and cover all of the state's curriculum standards in a one-year course. Moreover, to our knowledge no state today includes only reading, writing and arithmetic in its curriculum standards.

Further, Wyoming's basket of educational goods is reinforced by the state' high school graduation requirements. These require that students successfully complete performance standards as measured through state and district assessments, and take:

- Four school years of English
- Three school years of mathematics, science and social studies, and
- Pass examinations on the principles of the U.S. and Wyoming constitutions.

These high school graduation standards are enhanced by the state's Hathaway scholarship requirements listed as follows:

- MATH - Students must complete four years of math to include Algebra I, Algebra II, Geometry, and an approved additional math course
- LANGUAGE ARTS (English) - Students must complete four years of Language Arts at the college or industry preparatory level in grades 9-12 to include standards in Reading, Writing, Listening and Speaking.
- SCIENCE - Students must complete any four of the following Science courses: Physical Science, Physics I, Physics II, Chemistry I, Chemistry II, Biology I, Biology II, Geology, Computer Science, or an approved additional Science course
- SOCIAL STUDIES - Students must complete three years of Social.
- IN ADDITION TO THE ABOVE COURSEWORK, students must also complete four years of:
    - FOREIGN LANGUAGE courses (one of which must be taken in grades 9-12), **-or-**
    - FINE AND PERFORMING ARTS courses, **-or-**
    - CAREER-VOCATIONAL EDUCATION courses, **-or-**
    - Some combination of those three disciplines of which two years must be sequenced in the same discipline.

In sum, Wyoming's basket of education goods is comprehensive, reinforced by both high school graduation and Hathaway scholarship requirements, and requires a robust set of programs and services – all of which are embedded in the EB model – for it to be effectively delivered. Because reading is critical to a student's success in performing to all the state standards, we provide an extended discussion of reading and its key programmatic elements in the discussion of Element 17, Instructional and Library Materials.

The basket is comprehensive, in part, because no matter what course of studies a high school student completes – college prep or career tech – all of Wyoming's students are expected to achieve to Wyoming student content and performance standards. This includes children from low-income homes, English language learners (ELL) and students with mild and moderate disabilities. All school districts are expected to offer students the full basket of educational good and services.

The basket was enhanced in 2017 with the addition of computer science and computational thinking, and the elimination of applied technology and keyboarding. A cost-based funding model to support that basket must be sufficiently robust to allow students in all 48 school districts to have an equal opportunity to attain the Wyoming student content and performance standards.

Since 2006, Wyoming's policy makers have provided more than sufficient funding to meet this goal in most years, with state K-12 appropriations exceeding the amounts identified by the Evidence-Based (EB) Model. However, as Wyoming's revenue picture has changed during the past five years, the amount by which Legislative Model exceeded the EB Model - legislative grace - dropped from a high of over $100 million in 2011-12 to a low of $2.9 million for 2017-18, and actually fell below the EB level by $1.5 million in 2018-19. Wyoming's Legislative Service Office (LSO) estimates that actual funding will exceed the EB model in both 2019-20 and 2020-21 (LSO, 2019).

Before presenting our recalibration of the elements in the Wyoming K-12 Funding Model, this chapter provides a description of the school improvement model that has been the foundation of the EB Funding Model used to estimate school finance adequacy in Wyoming since 2005.

THE SCHOOL IMPROVEMENT MODEL EMBEDDED IN THE EVIDENCE-BASED APPROACH TO SCHOOL FINANCE ADEQUACY

The EB Model used to estimate a cost-based spending level for schools has been designed to allow districts and schools to provide every child with an equal opportunity to learn to State performance standards. The EB Model is unique in that it is derived from research and best practices that identify programs and strategies that boost student learning. Further, the formulas and ratios for school resources developed from that research have been reviewed by dozens of educator panels in multiple states, including Wyoming, over the past two decades. The EB Model relies on three major types of research:

1. Reviews of research on the student achievement effects of each of the EB Model's individual major elements, with a focus on randomized controlled trials, the "gold standard" of evidence on "what works."
2. Studies of schools and districts that have dramatically improved student performance over a 4-6-year period. For the 2020 recalibration, this includes ten case studies of Wyoming schools producing significant improvements in or consistently high levels of student performance on state tests.
3. Best practices either as codified in a comprehensive school design (e.g., Stringfield, Ross, & Smith, 1996) or from studies in other states and by other authors of schools that have dramatically improved student learning (e.g., Blankstein, 2010, 2011; Chenoweth & Theokas, 2011; Duncan & Murnane, 2013; Odden, 2009; Odden & Archibald, 2009).

As a result of our research and work in many states, the EB approach is now more explicit in identifying the components of a school improvement model, and better articulates how all the elements in the EB Model are linked at the school level to strategies that when implemented produce notable improvements in student achievement (see Odden & Picus, 2020 Chapter 5).

Improving and high performing schools have clear and specific student achievement goals, including goals to reduce achievement gaps linked to poverty and minority status. The goals are nearly always specified in terms of performance on state assessments.

Compared to traditional schools where teachers work in isolated classrooms, improving schools organize instruction differently. Regardless of the context – urban, suburban or rural, rich or poor

– improving and high performing schools organize teachers into collaborative teams: grade level teams in elementary schools and subject or course teams in secondary schools. With the guidance and support of instructional coaches, the teacher teams work with student data – usually short-cycle or formative assessment data – to:

- Plan standards-based curriculum units
- Teach those units simultaneously
- Debrief on how successful the units were, and
- Make changes when student performance does not meet expectations.

This collaborative teamwork makes instruction "public" over time by identifying a set of instructional strategies that work in the teachers' school. Over time all teachers are expected to acquire and use the instructional strategies that have been demonstrated to improve student learning and achievement.

Improving and high performing schools also provide an array of "extra help" programs for students struggling to achieve to standards. This is critical because the number of struggling students is likely to increase as more rigorous programs are implemented to prepare all students for Wyoming's content and performance standards. Individual tutoring, small group tutoring, periods during the day when extra help is provided, after school academic help and summer school focused on reading and mathematics for younger students, and courses needed for high school graduation for older students, represent the array of "extra help" strategies these improving schools deploy. The idea is to "hold standards" constant and vary instructional time. Further, these additional instructional services are provided to *all* students who need them and before a student is labeled with a disability.

These schools exhibit dense leadership. Teachers lead by coordinating collaborative teams and through instructional coaching. Principals lead by structuring the school to foster instructional improvement. The district leads by ensuring schools have the resources to deploy the strategies outlined above with a focus on aggressive student performance goals, improving instructional practice and taking responsibility for student achievement results.

Successful and improving schools seek out top talent. They know that the challenge to prepare students for the competitive and knowledge-based global economy is difficult and requires smart and capable teachers and administrators to effectively get the educational job done.

We have continued to enhance the details of the strategy of school improvement embedded in the EB Model. We most recently summarized our findings in the sixth edition of our textbook (Odden & Picus, 2020) as well as in several books that profile schools and districts that have moved the student achievement needle (Odden & Archibald, 2009; Odden, 2009; Odden, 2012). We have also studied dramatically improving schools in Vermont, Maine and Maryland as part of school finance studies we completed in those states. In 2020, we studied ten improving and consistently high performing schools in Wyoming. We found the theory of improvement embodied in the EB Model is reflected in nearly all these successful schools (Picus, Odden, et al., 2011; Picus, Odden, et al., 2013; Odden & Picus, 2015b), including the Wyoming case studies. Importantly, other researchers and analysts have found similar features of schools that significantly improve student performance and reduce achievement gaps (Blankstein, 2010, 2011; Chenoweth, 2007, 2009, 2017).

Greg Duncan and Richard Murnane (2014) reached similar conclusions. They note that for all students to have a chance at success in the emerging global economy, they will need high quality preschool programs, followed by effective elementary and secondary schools. The key features needed in each school include: 1) leadership focused on improving instructional practice; 2) organizing teachers in each school into teams that over time create a set of effective instructional practices that are deployed systematically in all classrooms; 3) a culture of assistance (e.g., instructional coaches and ongoing professional development) and accountability (e.g., adults taking responsibility for the impact of their school actions on student performance); and 4) an array of extra help strategies to extend learning time for any student who needs more time to achieve to standards.

Although the details of studies of improving and high performing schools vary, and different authors highlight somewhat different elements of the process, the overall findings are more similar than different. This suggests all schools can improve if they have adequate resources–a reality for Wyoming schools– and deploy them effectively.

The EB Model offers a framework for the use of resources by districts and schools to help them focus those resources on programs and strategies that would allow them to produce substantial gains in student academic performance. We organize the elements of the school improvement model embedded in the EB Model into ten areas. In general, we find schools and districts that produce large gains in student performance follow ten similar strategies (see Chapter 4 and 5 of Odden & Picus, 2020; Odden, 2009), resources for each of which are included in the EB Model:

1. **Analyze student data to become deeply knowledgeable about performance issues and to understand the nature of the achievement gap.** The test score analysis usually first includes review of state test results and then, over time, analysis of formative/short cycle assessments (e.g., Renaissance Learning Star Enterprise) as well as benchmark assessments (e.g., NWEA MAP) to help tailor instruction to precise student needs, to progress monitor students with an Individualized Education Plan to determine whether interventions are working, and to follow the progress of students, classrooms and the schools over the course of the academic year. Improving schools are "performance data hungry."

2. **Set high goals such as aiming to educate at least 90% of the students in the school to proficiency or higher on state reading and math tests**. This includes seeing that a significant portion of the school's students reach advanced achievement levels; having more high school students take and pass advanced classes such as Advanced Placement (AP) or International Baccalaureate (IB) classes; and making significant progress in closing the achievement gap. In Wyoming this means 85-90 percent or more of the students perform at the proficient or higher level on WY-TOPP end-of-year assessments. Further, because the goals are ambitious, even when not fully attained, they help the school produce large gains in student performance.

3. **Review evidence on good instruction and effective curriculum**. Successful schools throw out the old curriculum, replace it with a different and more rigorous curriculum, and over time create their specific view of what good instructional practice is to deliver that curriculum. Changing curriculum is a must for schools implementing Wyoming's student content and performance standards. And such new curriculum requires changes in instructional practice. Successful schools also want *all* teachers to learn and deploy new instructional strategies in their classrooms and seek to make good instructional practice systemic to the school and not idiosyncratic to each teacher's individual classroom.

4. **Invest heavily in teacher training**. This includes intensive summer institutes and longer teacher work years; providing resources for trainers: and, most importantly, funding instructional coaches in all schools. Time is provided during the regular school day for teacher collaboration focused on improving instruction. Nearly all improving schools have found resources to fund instructional coaches to work with school-based teacher data teams, to model effective instructional practices and to observe teachers and give helpful but direct feedback. This focus has intensified now that schools are delivering a more rigorous curriculum focused on educating all students to Wyoming student content and performance standards. And professional development is viewed as an ongoing and not a "once and done" activity.

5. **Provide extra help for struggling students.** Using a combination of state funds and Federal Title I funds, provide some combination of tutoring in a 1:1, 1:3, or 1:5 teacher to student format. In some cases, this also includes periods during each day when all students receive targeted extra help, as well as extended days, summer school, and English language development for all ELL students. These Tier 2 interventions in the Response to Intervention (RTI) approach to helping struggling students achieve to standards are absolutely critical. For many students, one dose of even high-quality instruction is not enough. Many students need a combination of extra help services in order to achieve to their potential. Research shows that schools producing large gains in student learning always used some array of these extra help strategies.

6. **Restructure the school day to provide more effective ways to deliver instruction**. This includes multi-age classrooms in elementary schools, block schedules and double periods of mathematics and reading in secondary schools, and "intervention" periods at all school levels. Schools also "protect" instructional time for core subjects, especially reading and mathematics. Further, most improving schools today organize teachers into collaborative teams – grade level teams in elementary schools and subject/course teams in secondary schools. These teams meet during the regular school day, often daily, and collaboratively develop curriculum units and lesson plans to teach those units, and then use common assessments to measure student learning results. Further, teams debrief on the impact of each collaboratively developed unit, reviewing student learning overall and across individual classrooms.

7. **Provide strong leadership and support for data-based decision making**. Data are used to improve the instructional program by leaders at all levels including, the superintendent, other district level leaders, principals and teacher leaders. Instructional

leadership is "dense" and "distributed" in successful schools. Leadership derives from the teachers coordinating collaborative teacher teams, from instructional coaches, the principal and even district leaders. Both teachers and administrators provide an array of complementary instructional leadership.

8. **Create professional school cultures.** These cultures are characterized by ongoing discussion of good instruction and teachers taking responsibility for the student performance results of their actions. Over time, the collaborative teams that deliver instruction produce a school culture characterized by: 1) high expectations of performance on the part of both students and teachers, 2) a systemic and school-wide approach to effective instruction, 3) a belief that instruction is public and that good instructional practices are expected to be deployed by every individual teacher, and 4) an expectation that the adults in the school are responsible for the achievement gains (or not made) by students. Professionals in these schools accept responsibility for student achievement results.

9. **Bring external professional knowledge into the school.** Examples of this include hiring experts to provide training; adopting new research-based curricula; discussing research on good instruction; and, working with regional education service agencies as well as the state department of education. Successful schools do not attain their goals by "pulling themselves up by their own bootstraps." They aggressively seek outside knowledge, find similar schools that produce results and benchmark their practices, and operate in ways that typify professionals.

10. **Talent matters**. Many improving schools today consciously seek to recruit and retain the best talent, from effective principal leaders to knowledgeable, committed and effective teachers. They seek individuals who are mission-driven to boost student learning, willing to work in a collaborative environment where all teachers are expected to acquire and deliver the school's view of effective instructional practice, and who are accountability focused.

CHANGES IN WYOMING STUDENT ACHIEVEMENT

The ambitious goals described above call for 85-90 percent of students to reach proficiency or higher in math and reading on the WY-TOPP, Wyoming's standardized test. Table 2.1 displays Wyoming standardized assessment results from the 2018-19 WY-TOPP assessment. The table shows that at all grade levels tested (3-10) the combined percentage of students achieving at the proficient and advanced levels in English Language Arts (ELA) and Math typically is between 50 and 56 percent, with performance in science, and 10th grade math generally lower. Only for sixth grade ELA did this total reach 60 percent. Performance approached 60 percent with seventh grade ELA as well at 58.62 percent. These results are substantially below the EB ambitious goal of 85-90 percent reaching the proficient or advanced performance level.

Put differently, the table shows that between 44.6 and 46.5 percent of students perform only at the basic level *or below* in mathematics and that between 50.88 and 45.2 percent of students perform only at the basic level *or below* in English Language Arts. These performance levels are not adequate for graduates to access jobs in the higher skill, higher wage economy Wyoming is trying to build.

We note that the EB performance aspirations are more robust than Wyoming's accountability goals. As we understand the system, Wyoming's accountability goals are based on having each school perform as well as schools in the top 35 percent, which are:

- Graduation rate of 88 percent
- Grade 3-8 Math – 57 percent of students proficient or above
- Grade 3-8 Reading – 59 percent of students proficient or above
- High School Math – 47 percent of students proficient or above
- High School Reading – 53 percent of students proficient or above
- Growth for students learning English – 59 percent of students learning English making progress

The State's accountability system allows schools to meet these goals over the next 15 years. As should be clear, the EB goals are more ambitious than the state student performance goals outlined above.

Another way to assess student performance in Wyoming is to compare it with other states. Table 2.2 provides a historic look at the results of the National assessment of Educational Progress These results suggest that on a national basis, Wyoming compares relatively well, although the percent proficient or in any subject in recent years has not surpassed 51 percent and is closer to 40 percent or below in most subjects except fourth grade math. Since 2013, the percent proficient and above for fourth grade math has been near 50 percent, ranging from 47.8 percent to 50.78 percent. For eight grade math, the percent proficient and above since 2013 has been between 35.3 percent and 38.5 percent. Reading performance is generally lower with grade four performance ranging between 37.1 percent and 41.4 percent proficient and above, and grade eight performance between 36.0 percent and 37.6 percent since 2013.

Moreover, scoring above the U.S. average is not an accomplishment to be touted because most policymakers and educators across the country view the U.S. average student performance as being inadequate. In international achievement comparisons such as the PISA, the U.S. average is not number one in any subject or at any grade level, and often is down in the middle of the pack even including countries with much less advanced economies than the U.S.

Table 2.1: Student Performance on the WY-TOPP, 2018-19

Grade	Subject	Percent Below Basic	Percent Basic	Percent Proficient	Percent Advanced	Percent Basic and Below	Percent Proficient and Advanced
3	Math	22.43%	24.08%	28.70%	24.79%	46.51%	53.49%
3	English Language Arts (ELA)	21.77%	23.41%	36.17%	18.65%	45.18%	54.82%
4	Math	22.75%	24.31%	25.02%	27.93%	47.05%	52.95%
4	Science	17.88%	30.10%	35.51%	16.50%	47.99%	52.01%
4	English Language Arts (ELA)	23.87%	27.01%	30.54%	18.58%	50.88%	49.12%
5	Math	22.52%	22.12%	34.79%	20.57%	44.64%	55.36%
5	English Language Arts (ELA)	22.15%	22.30%	35.48%	20.07%	44.45%	55.55%
6	Math	22.73%	22.22%	30.64%	24.41%	44.95%	55.05%
6	English Language Arts (ELA)	20.77%	18.40%	43.22%	17.61%	39.17%	60.83%
7	Math	24.35%	23.66%	26.57%	25.42%	48.01%	51.99%
7	English Language Arts (ELA)	22.13%	19.24%	38.11%	20.52%	41.38%	58.62%
8	Math	23.42%	22.10%	24.71%	29.77%	45.52%	54.48%
8	Science	17.82%	34.67%	38.31%	9.20%	52.49%	47.51%
8	English Language Arts (ELA)	21.69%	17.59%	40.23%	20.49%	39.28%	60.72%
9	Math	31.58%	28.04%	27.19%	13.19%	59.62%	40.38%
9	English Language Arts (ELA)	30.70%	16.61%	35.97%	16.71%	47.31%	52.69%
10	Math	31.90%	22.90%	28.72%	16.49%	54.80%	45.20%
10	Science	27.25%	24.46%	33.06%	15.23%	51.71%	48.29%
10	English Language Arts (ELA)	23.92%	23.32%	31.18%	21.58%	47.24%	52.76%

Source: Wyoming Department of Education. https://portals.edu.wyoming.gov/Reports/(S(wlzatixzugcbpuotis523j4b))/Public/wde-reports-2012/public-reports/assessment/pawsresultsstatelevelaggregated. Retrieved August 17, 2020.

Table 2.2
Summary of NAEP Results for Wyoming: 1992-2019

Year	Score	Standard Error	Difference from National	At or above *Basic* (%)	Standard Error	At or above *Proficient* (%)	Standard Error	At *Advanced* (%)	Standard Error
Math Grade 4									
2019	245.84	0.723	5.84	87.10	0.866	47.80	1.325	8.91	0.771
2017	247.82	0.645	8.66	88.62	0.94	50.78	1.043	10.00	0.788
2015	246.76	0.571	6.91	88.42	0.802	48.30	1.243	8.96	0.698
2013	246.52	0.387	5.34	90.19	0.655	47.81	0.871	6.56	0.510
2011	243.87	0.448	3.76	87.88	0.735	43.92	1.329	5.44	0.437
2009	242.01	0.571	2.92	87.41	0.934	40.46	1.225	4.07	0.486
2007	243.87	0.456	4.80	88.46	0.691	44.26	0.983	4.57	0.504
2005	242.96	0.614	5.85	87.13	0.910	42.61	1.427	5.13	0.683
2003	241.09	0.602	7.13	87.10	0.821	38.80	1.146	3.52	0.389
2000	228.63	1.128	4.42	71.37	1.957	24.74	1.378	2.14	0.383
2000[1]	229.25	1.303	3.01	73.06	1.971	25.14	1.463	1.97	0.489
1996[1]	223.20	1.385	0.85	63.95	1.749	18.82	1.229	1.34	0.331
1992[1]	225.38	0.930	6.79	68.61	1.392	18.70	1.127	0.98	0.297
Math Grade 8									
2019	286.31	0.895	5.33	76.42	1.073	37.14	1.288	8.49	0.766
2017	288.76	0.659	6.80	79.17	0.805	38.45	1.086	9.29	0.692
2015	286.67	0.722	5.39	78.46	0.905	35.27	1.203	7.19	0.699
2013	288.12	0.537	4.50	80.65	0.837	37.82	1.105	6.56	0.527
2011	287.77	0.603	5.04	80.33	1.049	37.43	1.224	7.07	0.728
2009	286.10	0.625	4.43	78.08	1.239	34.65	1.058	6.79	0.606
2007	286.99	0.747	6.82	79.80	1.133	35.98	1.631	6.52	0.691
2005	282.10	0.750	4.58	76.34	1.139	29.03	1.405	3.47	0.405
2003	283.50	0.680	7.39	76.72	0.963	32.33	1.000	4.40	0.526
2000	275.57	0.978	3.74	68.83	1.298	23.46	1.012	3.46	0.407

Year	Score	Standard Error	Difference from National	At or above *Basic* (%)	Standard Error	At or above *Proficient* (%)	Standard Error	At *Advanced* (%)	Standard Error
2000[1]	276.69	1.176	2.27	69.90	1.381	24.71	1.096	3.54	0.473
1996[1]	274.78	0.910	4.27	68.33	1.186	21.61	0.987	2.45	0.563
1992[1]	275.08	0.855	8.21	67.23	1.333	21.03	1.066	1.93	0.394
1990[1]	272.15	0.675	10.40	63.75	1.257	18.54	0.906	1.68	0.247
Reading Grade 4									
2019	226.69	0.888	7.25	73.34	1.144	40.55	1.219	9.80	0.848
2017	226.83	0.879	6.02	74.15	0.915	41.36	1.501	9.15	0.911
2015	228.16	0.684	6.80	75.23	0.998	41.23	1.205	9.65	0.695
2013	225.85	0.551	5.17	74.73	1.005	37.13	0.948	7.10	0.490
2011	224.06	0.761	4.04	71.34	1.262	34.38	1.105	6.75	0.621
2009	222.65	0.666	3.05	71.75	1.092	32.61	1.045	4.72	0.615
2007	225.29	0.518	5.63	73.50	1.007	36.38	0.960	7.78	0.853
2005	223.26	0.739	5.96	70.82	1.201	34.45	1.381	7.14	0.633
2003	222.08	0.839	5.62	68.60	1.284	33.73	1.124	7.47	0.693
2002	221.13	1.009	4.33	68.28	1.413	31.44	1.312	5.6	0.525
1998	218.23	1.539	5.42	63.88	1.951	29.46	1.527	6.05	0.710
1998[1]	219.01	1.620	3.57	65.18	2.051	29.88	1.993	6.30	0.701
1994[1]	221.19	1.235	8.85	68.21	1.745	31.83	1.373	5.52	0.639
1992[1]	222.98	1.146	8.15	70.99	1.622	32.74	1.524	5.42	0.586
Reading Grade 8									
2019	264.64	0.793	2.64	75.19	1.146	33.93	1.140	2.99	0.533
2017	269.02	0.709	3.69	80.39	0.760	37.63	1.198	3.43	0.514
2015	268.80	0.743	4.81	80.96	1.036	35.98	1.207	2.94	0.463
2013	270.97	0.602	4.95	84.41	0.745	37.61	1.028	2.46	0.390
2011	269.57	0.966	5.98	81.60	0.977	37.71	1.572	2.72	0.482
2009	268.16	0.985	5.87	81.75	1.425	34.44	1.842	1.68	0.470
2007	266.23	0.718	5.21	79.72	1.106	33.19	1.006	1.70	0.461

Year	Score	Standard Error	Difference from National	At or above *Basic* (%)	Standard Error	At or above *Proficient* (%)	Standard Error	At *Advanced* (%)	Standard Error
2005	268.12	0.678	7.72	81.00	0.994	35.69	1.436	2.22	0.374
2003	267.00	0.525	5.67	79.19	0.893	33.74	1.083	2.12	0.247
2002	264.94	0.673	2.19	78.25	1.339	30.76	1.078	1.53	0.284
1998	263.20	1.320	2.54	75.73	1.849	30.67	1.501	1.98	0.462
1998[1]	262.12	1.317	0.73	75.62	1.360	29.40	1.514	1.55	0.424
Science Grade 4									
2015	161.29	0.616	8.53	86.47	0.810	44.67	1.266	0.52	0.201
2009	155.67	0.732	6.93	80.29	0.966	36.92	1.165	#	0.181
Science Grade 8									
2015	160.33	0.562	7.44	78.88	0.927	37.82	1.095	0.73	0.202
2011	160.28	0.490	9.54	77.60	0.892	38.12	1.091	1.10	0.398
2009	158.15	0.653	9.49	74.21	1.230	35.99	1.30	1.41	0.334
Writing Grade 4									
2002	150.30	1.081	-2.37	85.37	0.875	22.72	1.395	1.01	0.244
Writing Grade 8									
2007	157.94	0.989	3.66	90.54	0.877	34.21	1.548	1.40	0.286
2002	151.43	0.868	-0.19	85.56	1.001	27.70	1.183	1.16	0.257
1998	145.52	1.429	-2.30	81.02	1.476	23.17	1.660	0.99	0.394

[1] Accommodations were not permitted for this assessment

Insufficient data

xxx	Significantly higher than National public
xxx	Not significantly different from National public
xxx	Significantly lower than National public

Source: National Assessment of Educational Progress, https://www.nationsreportcard.gov/profiles/stateprofile/overview/WY?cti=PgTab_OT&chort=1&sub=MAT&sj=WY&fs=Grade&st=MN&year=2019R3&sg=Gender%3A+Male+vs.+Female&sgv=Difference&ts=Single+Year&sfj=NP Last accessed August 17, 2020.

Chapter 3
Using the Evidence-Based Model to Recalibrate All Elements of the Wyoming K-12 Funding Model

INTRODUCTION

This chapter uses the Evidence-Based (EB) Model to recalibrate each element of the current Wyoming K-12 Funding Model. This 2020 Recalibration represents the fourth time Picus Odden & Associates has conducted a recalibration of the Wyoming K-12 funding model. In all of our previous work we relied on the EB Model to estimate the personnel and dollar resources needed to enable each school district in the state to provide the educational program as described in State Law (W.S. 21-9-101 and W.S. 21-9-102). The educational program established following the initial *Campbell* court ruling remained the same until 2018 when the Legislature amended the law adding computer science and computational thinking and eliminating applied technology and keyboarding from the list of standards outlined in the basket (W.S. 21-9-101(a)(i)).

In addition to incorporating these changes into our estimates of the EB model in Wyoming, it is important to note that the EB model itself has changed modestly over time. In addition to our work in Wyoming, in the last 20 years we have conducted EB studies in 11 other states and three school districts, in some cases on multiple occasions. As we continue to review the research on school improvement and study how schools implement this research to improve student performance the EB model has evolved. The most notable changes can be seen in increases in counseling services for all students, including those most at risk, largely in response to our continued findings across all of the states where we work about the growing social and emotional needs of children and their families.

In the material that follows we identify areas where the EB model has changed since 2015 and point out areas where the EB has been specifically modified to meet the unique educational conditions of Wyoming's 48 school districts. The five parts of this chapter include the following:

1. Staffing for core programs, which includes full-day kindergarten, core teachers, elective/specialist teachers, minimum teachers, substitute teachers, instructional facilitators/coaches, core tutors, core guidance counselors, nurses, supervisory aides, librarians, library aides, school computer technicians, principals/assistant principals, and school secretarial and clerical staff.

2. Dollar per student resources for gifted and talented students, professional development, instructional materials and supplies, short cycle/interim assessments, computers and other technology, career and technical education equipment and materials, and extra duty/student activities.

3. Central functions, which include maintenance and operations, central office personnel and non-personnel resources.

4. Resources for struggling students including at-risk tutors, at-risk pupil support, extended day personnel, summer school personnel, ELL personnel, and alternative school personnel.

5. Personnel compensation resources including salary levels, health insurance, benefits for workers' compensation, unemployment insurance, retirement and social security. Two separate parallel studies were conducted to analyze professional and classified salary levels in detail to determine whether EB Model salaries are at a market level or need to be adjusted. This report's recommendations draw from those studies (Stoddard, 2020a, 2020b). Two additional studies were conducted to strengthen the state's approach to regional (RCA) and external (ECA) cost adjustments. This report's recommendations on the RCA and ECA are derived from the conclusions of those studies (Taylor, 2020a, 202b).

In addition to recalibrating the elements of the current Wyoming K-12 funding model, Chapter 4 addresses two new potential elements including PreK and school safety.

Each section in this chapter describes an individual element of the Wyoming K-12 funding model. Individual element descriptions begin with a summary table that includes the 2015 EB recommendation for the element, the current Legislative funding model for the element, and our 2020 evidence-based recommendation for the element. The summary table for each element also includes an estimate of the cost difference between the current Legislative Model and 2020 EB recommendation. This summary table is provided for each element of the model and is followed by an evidence-based analysis of the parameters for that element.

The evidence-based analysis describes current research and related evidence and provides the rationale for how the 2020 version of the EB Model allocates resources for the element. At times, the analysis section includes a discussion of terms and phrases to ensure full understanding of the wording used for each element. Each element section then discusses how Wyoming school districts used the resources allocated for the particular element, drawing from the 2018-19 *Continuing Review of Educational Resources in Wyoming* (CRERW) report. Each section then summarizes the input we received from the 18 Professional Judgement Panels on the element. Finally, each section ends by stating the 2020 EB recommendation for the element.

In short, each element section of this chapter is designed to facilitate an understanding of the relationships and differences among:

- The 2015 EB recommendations
- The Legislative Model, which is the actual model implemented by the Legislature, and
- The 2020 EB recommendations.

Before proceeding with our analysis of the model elements, there are three overarching issues that need to be described as they impact the analysis of each of the elements that follows.

Three Tier Approach

We emphasize that the design of the EB Model reflects the Response to Intervention (RTI) model. RTI is a three-tier approach to meeting student needs. Tier 1 refers to core instruction for all students. The EB Model seeks to make core instruction as effective as possible with its modest class sizes, provisions for collaborative time, and robust professional development resources. Effective core instruction is the foundation on which all other educational strategies depend. Tier 2 services are provided to students struggling to achieve to standards before being given an individualized education program (IEP) and labeled as a student with a disability and thus part of the special education program. The EB Model's current Tier 2 resources include one core tutor for every prototypical school and additional resources triggered by at-risk and ELL student counts providing funding for tutoring, extended day, summer school, additional pupil support and ELL services. These services are available for all students and differ from any additional services students receive through an IEP. These Tier 2 resources are sufficient to allow every district/school to create a Multi-Tiered System of Supports (MTSS) for struggling students. Tier 3 includes all special education services.

The 2020 recalibration includes a comprehensive assessment of special education and provides options for improving the provision of special education services in a cost-effective manner. The special education study is provided as a separate report (District Management Group, 2020). Readers should note that all special education recommendations depend on the base programs provided by Tier 1 and Tier 2 resources.

Student Counts

Two pupil counts used in the EB model and in the Wyoming block grant funding model need to be defined. They are Average Daily Membership (ADM) and the count of at-risk students.

Prior to 2017, ADM in the funding model was computed at the school level and used to generate resources for schools and their respective school districts. ADM in the funding model was calculated prior to 2017 as the greater of the prior year or the three-year average ADM for each school. Today, "greater of" computation of ADM is done at the district level rather than the school level, and then applied at each school to avoid an overduplication of ADM counts among schools.

At-risk students are defined as the unduplicated count of ELL students in grades K-12, free and reduced meal eligible students in grades K-12, and mobile students in grades 6-12. All ELL students receive resources specifically directed toward ELL programs. In addition, all ELL students, as well as all other students who are either eligible for free and reduced-price meals or are defined as mobile, receive all of the other resources triggered by at-risk student counts. For the Wyoming funding model, "mobile student" means any student reported as primarily enrolled in any grade six (6) through twelve (12) within a district on the annual Department spring accountability snapshot date where the student's school entry date falls after the October snapshot of the same school year. Although students in lower grades may also enroll in schools after the October enrollment count, they are not part of the Legislative funding model.

Prototypical Schools

A key component of the EB Model is the use of prototypical-sized schools to demonstrate how the formulas in the EB model are used to allocate resources to schools. This is followed by prorating resources to schools that are smaller or larger than the prototypical size based on actual school enrollments. The prototypes used in Wyoming were developed specifically for the state to reflect the range of, and very small school sizes, across the state. In the Wyoming K-12 Funding Model, prototypical school sizes are used as the basis for estimating resource needs and for prorating resource generation.

In Wyoming the current school size prototypes used in the Legislative Model are:

- Elementary Schools: A prototypical elementary school is 288 ADM. Components of the model further break this down into two section schools of 192 ADM and one-section schools of 96 students.

- Middle Schools: A prototypical middle or junior high school has 315 ADM with smaller enrollment categories utilized in components of the model of prorated down to a school of 105 ADM.

- High Schools: A prototypical high school has 630 ADM with smaller enrollment categories utilized in components of the model of prorated down to a school of 105 ADM. It should be noted that in the allocation formulas that follow, some high school resources are allocated on the basis of every 315 students in the school.

These prototypes were developed for the 2005 recalibration following a decision by the 2005 Select Committee on School Finance Recalibration to continue using the class sizes of 16 at the elementary level and 21 at the secondary level used in the prior Wyoming K-12 Funding Model. With average class sizes of 16, the 288-student prototypical elementary school has 48 students at each grade level (K-5) resulting in what is typically called a three-section school – three classrooms of 16 students at each grade level. The prototypical middle school (315 students) has 105 students at each grade level (5 classes of 21 at each grade level). A prototypical high school has 630 students or is twice the size of the prototypical middle school.

In other states our EB model utilizes prototypical school sizes of 432 or 450 for elementary schools, 450 for middle schools and 600 for high schools. This generally derives from EB Model class size recommendations, which differ from the class sizes used in the Legislative Model in Wyoming (see Elements 3 and 4), and from larger average school sizes generally found in other states.

MODEL SUMMARY AND COMPARISON

In the sections that follow, we describe how each element of the EB model is resourced. Table 3.0 provides a summary of how each element is calculated under the EB recommendations from the 2015 and 2020 recalibrations, along with the current allocation used in the Legislative Model. The table provides estimates of the FTE differences between the 2020 EB Model recommendations and the current Legislative Model.

Table 3.0 Summary of Model Elements for 2015 and 2020 Evidence-Based Model Recommendations and Legislative Model
(Note: Two cost estimates are provided for elements that include positions paid at the level of teachers. Salaries were computed at both 75% ($54,500) and 85% ($61,700) of the salaries of other professional and technical workers in Wyoming. For elements where the cost difference only includes one figure, all of the employees identified for that element are in positions funded for a position other than a teacher.)

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
STAFFING FOR CORE PROGRAMS				
1. Full-Day Kindergarten	Full-day kindergarten provided.	Full-day kindergarten provided. At least one school in each district must have a full-day kindergarten program.	Full-day kindergarten provided.	None
2. Elementary Core Teachers/Class Size	Grades K-3: 15; Grades 4-5/6: 25. Average class size of 17.3 (K-5) or 18.1 (K-6).	Grades K-5/6: 16. Average class size of 16 (K-5/6).	Grades K-3: 15; Grades 4-5/6: 25. Average class size of 17.3 (K-5) or 18.1 (K-6).	-273 FTE -$19.2 million (75%) $3.8 million (85%)
3. Secondary Core Teachers/Class Size	Grades 6-12: 25.	Grades 6-12: 21.	Grades 6-12: 25.	Middle school: -149 FTE -$11.6 million (75%) -$4.6 million (85%) High school: -158 FTE -$11.7 million (75%) -$2.4 million (85%)

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
4. Elective/Specialist Teachers	**Elementary Schools**			
	20% of core elementary school teachers.	20% of core elementary school teachers.	20% of core elementary school teachers.	-55 FTE -$3.8 million (75%) $0.8 million (85%)
	Middle Schools			
	20% of core middle school teachers.	33% of core middle school teachers.	20% of core middle school teachers.	-151 FTE -$12.4 million (75%) -$11.0 million (85%)
	High Schools			
	33 1/3% of core high school teachers.	33% of core high school teachers.	33 1/3% of core high school teachers.	-49 FTE -$3.6 million (75%) -$0.5 million (85%)
5. Additional Vocational/Career Technical Education (CTE) Teachers	No additional vocational education teachers resourced.	Apply an additional weighting factor of 29% to vocational education (CTE) student FTEs. Based upon weighted student count, provide an additional teacher for every 21 students.	No additional vocational education teachers resourced.	-40 FTE -$3.3 million

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
6. Minimum Teacher and Staff Resources	*Minimum Teachers* <u>Elementary Schools</u>: a minimum of 7.0 teachers provided for elementary school grade bands with ADM greater than 49. <u>Middle Schools</u>: a minimum of 7.0 teachers provided for middle school grade bands with ADM greater than 49. <u>High Schools</u>: a minimum of 7.0 teachers provided for high school grade bands with ADM greater than 49. For school grade bands of 49 & below, minimum teacher resources are provided on a prorated basis at 1 teacher for every 7 students, with a minimum of 1.0 teacher position.	*Minimum Teachers* <u>Elementary Schools</u>: a minimum of 6.0 teachers provided for elementary school grade bands with ADM greater than 49. <u>Middle Schools</u>: a minimum of 8.0 teachers provided for middle school grade bands with ADM greater than 49. <u>High Schools</u>: 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 7 students with a minimum of 1.0 teacher.	*Minimum Teachers* For schools with more than 49 ADM, the 2020 EB minimum teacher recommendation is seven teachers at elementary and middle schools, and nine minimum teachers at high schools. For schools with 49 or fewer ADM, resources are provided on the basis of one assistant principal position and one teacher position for every seven students, with a minimum of 1.0 teacher position. Other non-staff elements are resourced plus staff resources generated by the at-risk and ELL student counts. *Non-Teacher Staff Resources*	69 FTE for minimum number of teachers per school $6.1 million (75%) $8.6 million (85%) 47 FTE for Small School Teachers $4.2 million (75%) $5.8 million (85%) -14 FTE for Small District Teachers -$1.1 million (75%)

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	Non-Teacher Staff Resources For schools with ADM less than the highest-grade band's one-section school, provide 1.0 assistant principal position 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	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 enrolled. *Minimum Staff (Small School Adjustment)* For elementary, middle and high schools of 49 ADM & 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. For schools with 49 or fewer ADM, all Dollar per pupil resources are provided at the school level, core and at-risk	For schools with ADM less than the highest-grade band's one-section school, provide 1.0 assistant principal position. Other non-staff elements are resourced plus staff resources generated by the at-risk and ELL student counts.	-$1.1 million (85%)

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
		tutors, counselors and pupil support are not funded, and it is assumed the 1:7 ratio for teachers provides adequate staffing.		
7. Instructional Facilitators/Coaches	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 instructional facilitator position for each school district. Fund as a categorical grant.	Provide 0.45 instructional facilitator/coaches for prototypical elementary (288 ADM) and secondary (315 ADM) schools at the highest-grade band level. Funding rolled into the Block Grant.	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 instructional facilitator position for each school district. Fund as a categorical grant.	321 more FTEs $27.2 million (75%) $31.3 Million (85%)
8. Core Tutors/Tier 2 Intervention	Provide 1.0 core tutor position for each prototypical 288-ADM elementary school and for every 315 middle or high school ADM, resourced at the highest grade-band level.	If the provision of at-risk tutors (element 26) is less than 1.0, additional tutor resources are provided so that a prototypical school receives a minimum of 1.0 tutor. This minimum is prorated down as school ADM decreases	Provide 1.0 core tutor position for each prototypical 288-ADM elementary school and for every 315 middle or high school ADM, resourced at the highest grade-band level.	215 FTEs $18.6 million (75%) $23.8 million (85%) *Note: Net increase in total tutors includes both Core (Element 8) and At-Risk tutors (Element 26). EB Model Generates*

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
				302.6 core tutors and 287.6 at risk tutors.
9. Substitute Teachers	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 $103 plus 7.65% for social security and Medicare benefits ($110.85). Daily salary adjusted by regional cost adjustment.	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.	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 $120 plus 7.65% for social security and Medicare benefits ($129.18). Daily salary adjusted by regional cost adjustment.	$2.4 million *Note: Since this component is variable based on the number of teachers, tutors, IFs, summer school and extended-day teachers, the estimated FTE staff difference will fluctuate if any of those components are changed.*

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
10. Core Counselors and Nurses	**CORE COUNSELORS**			
	Provide 1.0 school counselor position for each prototypical elementary school (288 ADM) and 1.0 school counselor position for every 250 ADM in middle and high schools.	For elementary schools, if the provision of at-risk tutors (element 26) is less than 1.0, additional tutor resources are provided so that a prototypical school receives a minimum of 1.0 tutor. This minimum is prorated down as school ADM decreases. For middle and high schools, provide 1.0 counselor position for every 250 ADM	Provide 1.0 school counselor position for each prototypical elementary school (288 ADM) and 1.0 school counselor position for every 250 ADM in middle and high schools. Provide a minimum of 1.0 counselor position for each district.	165 FTEs $14.1 million (75%) $17.2 million (85%) *Note: The minimum of 1.0 counselor per district increases the number of counselors by 2.97 FTE statewide.*
	NURSES			
	Provide 1.0 school nurse position for every 750 ADM.	No nurses resourced directly, but districts can use minimum pupil support resources as nurse positions.	Provide 1.0 school nurse position for every 750 ADM. Provide a minimum of half a nurse position for each district.	125 FTEs $10.5 million (75%) $11.7 million (85%) *Note: The minimum of one-half nurse per district increases the number of nurses by 2.06 FTE nurses statewide.*
11. Supervisory Aides	Provide funding at an amount equal to 2.0	Provide funding at an amount equal to 2.0	Provide funding at an amount equal to 2.0	-81 FTEs -$1.4 million

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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.	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.	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.	
12. Librarians and Librarian Media/School Computer Technicians	<u>Librarian Positions</u>: For elementary schools, provide librarian resources at the following levels: for elementary schools with ADM less than 96 ADM, prorate a 0.50 librarian position down; for elementary schools with ADM between 96 and 143, provide a 0.50 librarian position; for elementary schools with	<u>Librarian Positions</u>: Provide 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 prorate down and	<u>Librarian Positions</u>: For elementary schools, provide librarian resources at the following levels: for elementary schools with ADM less than 96 ADM, prorate a 0.50 librarian position down; for elementary schools with ADM between 96 and 143, provide a 0.50 librarian position; for	-51 Librarian FTEs -\$3.8 million (75%) -\$1.8 million (85%)

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	ADM between 143 and 288, provide a 1.0 librarian position prorated down to 143 ADM. For middle and high schools, provide librarian resources at the following levels: for middle and high 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 middle and high 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. <u>Library Aide Positions</u>: For elementary schools, provide library aide	above 630 ADM prorate up. <u>Library Media/Computer Technician Position</u>: Provide 1.0 library media/computer technician position for every 315 middle and high school ADM, prorated up and down.	elementary schools with ADM between 143 and 288, provide a 1.0 librarian position prorated down to 143 ADM. For middle and high schools, provide librarian resources at the following levels: for middle and high 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 middle and high 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. <u>Library Aide Positions</u>:	53 Library Aide FTEs

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	resources at the following levels: 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. <u>School Computer Technician Position directed by District</u>: Provide 1.0 school computer technician position for every 630 elementary, middle and high school ADM, prorated up and down,		For elementary schools, provide library aide resources at the following levels: 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 945ADM prorate up 1.0 library aide for every additional 630 ADM. <u>School Computer Technician Position directed by District</u>: Provide 1.0 school computer technician position for every 630	$2.4 million 6 Computer Technician FTEs $0.8 million Net Total for all library staff: 26 FTEs $1.4 million

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	with a minimum of a 0.5 position for each district.		district ADM, with a minimum of a 0.5 position for each district.	
13. Principals and Assistant Principals	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 middle and high school ADM beginning at 316 ADM and for middle and high schools below 105 ADM Resourced at the highest-grade band level.	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, resourced at the highest-grade band level. Provide 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.	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 middle and high school ADM beginning at 316 ADM and for middle and high schools below 105 ADM Resourced at the highest-grade band level.	Principals: -16 FTEs -$2.7 million Assistant Principals: 0 FTE difference $1.0 million *Alternative school principals* *-21 FTEs*** -$2.2 million *Small School Assistant Principals* *43 more FTEs*** $6.0 million
14. School Site Secretarial Staff	<u>Secretarial Staff</u>: Provide 1.0 secretary position for all prototypical schools	<u>Secretarial Staff</u>: Provide 1.0 secretary position for all prototypical schools	<u>Secretarial Staff</u>: Provide 1.0 secretary position for all prototypical schools	6 Secretarial FTE -$0.1 million

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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. <u>Clerical Staff</u>: 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.	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. <u>Clerical Staff</u>: 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.	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. <u>Clerical Staff</u>: 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.	 -82 Clerical FTE -$2.1 million

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	
DOLLAR PER PUPIL STUDENT RESOURCES				
15. Gifted and Talented	Provide an amount equal to $44.08 per ADM., inflated annually.	Provide an amount equal to $44.07 per ADM.	Provide an amount equal to $40 per ADM, inflated annually.	-$376,446
16. Intensive Professional Development	Provide 10 days of student free time for training embedded in salary levels. Provide $137.74 per ADM for trainers.	Provide 10 days of student free time for training embedded in salary levels. Provide 137.72 per ADM for trainers.	Provide 10 days of student free time for training embedded in salary levels. Provide $130 per ADM for trainers.	-$713,542
17. Instructional and Library Materials	Provide $190.00 per ADM for elementary, middle and high schools.	Provide $209.33 per ADM.	Provide $210.00 per ADM for elementary, middle and high schools.	$44,584
18. Short-Cycle/Interim Assessments	Provide $25 per ADM and not subject to an ECA.	No funding.	Provide $25 per ADM and not subject to an ECA.	$2,311,089
19. Technology and Equipment	Provide an amount equal to $250.00 per ADM not subject to an ECA adjustment in future years.	Provide an amount equal to $250.00 per ADM not subject to an ECA adjustment in future years.	For a three-to-one student-to-computer ratio provide an amount equal to $250.00 per ADM not	No Difference at $250 per ADM

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
			subject to an ECA in future years. For a one-to-one student-to-computer ratio provide an amount equal to $350.00 not subject to an ECA in future years. This option requires a policy decision by the state.	$9,244,391 at $350 per ADM
20. CTE Equipment and Materials	Provide an amount equal to $10,313.88 per vocational education teacher FTE.	Provide an amount equal to $10,315.40 per vocational education teacher FTE.	Provide an amount equal to $10,000 per vocational education teacher FTE. Not subject to the ECA	-$88,266
21. Extra Duty Funds/Student Activities	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 from the Legislative Model. For elementary grades, provide an amount equal to $23.62 per ADM. For	For elementary grades, provide an amount equal to $26.02 per ADM. For middle and high schools, use inverse sliding scales based on ADM. Middle school funding levels range from $856.00 for 1 ADM and $221.16 per ADM for a school of 1,260 ADM. High school funding levels range from	For districts with 2,000 or more ADM provide $599 for each high school ADM, $322 for each middle school ADM and $25 for each elementary ADM. For districts with 500 ADM provide $1,497.50 per high school ADM, $805 per middle school ADM and $62.50 for every	-$2,953,401

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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.	$2,206.59 for 1 ADM and $650.45 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.	elementary ADM (2.5 times the number for a district with 2,000 or more ADM). Prorate the per ADM amount between 2,000 and 500 students. For districts with 150 or fewer ADM provide $1,797 per ADM for high school ADM, $996 per middle school ADM, and $75 per elementary school ADM (3.0 times the amount for a district with 2,000 or more ADM). Prorate the per ADM amounts between 500 and 150 students. Adjust these figures by an annual ECA.	
CENTRAL FUNCTIONS				
22. Operations and Maintenance	<u>Custodian Positions</u>: Calculated on the basis of four factors: 1) number of model generated teachers; 2) school ADM; 3) number of classrooms as	<u>Custodian Positions</u>: Calculated on the basis of four factors: 1) number of model generated teachers; 2) school ADM; 3) number of classrooms	<u>Custodian Positions</u>: Calculated on the basis of four factors: 1) number of model generated teachers; 2) school ADM; 3) number	-18 Custodian FTEs -$2.1 million *Note: Differences for custodians are due to*

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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-	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-	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.	*class sizes which generate teachers, which are then used in the custodial formulae.*

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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). <u>Maintenance Worker Positions</u>: 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	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). <u>Maintenance Worker Positions</u>: 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	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). <u>Maintenance Worker Positions</u>: Calculated on the basis of three factors: 1) building; 2) the lesser of actual educational GSF or SFD allowable educational GSF adjusted up by 115%; 3) school ADM. These three factors are added together and divided by three 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	32 Maintenance worker FTEs $5.1 million *Note: FTE differences for maintenance workers due to the elimination of the $5 million operating cost factor from 2020 EB Model recommendations*.

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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	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	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; 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	

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	schools are sufficient to service all buildings in a district, both educational and non-educational.	allowable educational GSF for schools are sufficient to service all buildings in a district, both educational and non-educational.	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 received no additional	Groundskeeper Positions: Determined at the site rather than building/program level. The number of FTEs for all educational 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	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	No Change in number of Grounds-keepers -$3.7 million

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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 upon 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	received 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 upon 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	level or use of the site, with non-educational and elementary school sites received 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 upon 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,	

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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.	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.	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.	
	<u>Supplies and Materials</u>: Funding for O&M supplies is calculated at a rate of $0.67 per GSF for both educational and non-educational space, inflated annually to $0.70. For	<u>Supplies and Materials</u>: Funding for O&M supplies is calculated at a rate of $0.73 per GSF if for both educational and non-educational space. For educational space,	<u>Supplies and Materials</u>:	-$58,447

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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) inflated annually. For additional school buildings added	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: Actual SY 2009-10 expenditures by district as adjusted by 2015 Wyoming Session Laws, Chapter 142, Section 2, Section 205 footnote 2(a)(i)(D) and (ii)(D) and further adjusted by -10.762% (SY 2017-18) and 10.823% (SY 2019-20). For additional school buildings added to district building inventories after SY 2009-10, 100% of SY 2009-10 district average	Funding for O&M supplies is calculated at a rate of $0.73 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 2018-19 district expenditures as reported by the WDE (expenditure functions 3410-3450 & 3490 Only; Objects 451-459 plus	$1,820,198

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	(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.	utility expenditures per gross square foot, as adjusted by the Legislature, for district school buildings multiplied by the additional authorized educational square footage.	communications – object 340, excluding special education functions 1210 & 2230 and student transportation functions 3510 & 3520) as adjusted by the ECA as computed annually. 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.	
23. Central Office Staffing and Non-Personnel Resources	<u>Central Office Personnel</u>: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions.	<u>Central Office Personnel</u>: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions.	<u>Central Office Personnel</u>: 500 or fewer ADM: 2.5 administrative and 2.0 classified positions.	-51 Administrative Position FTEs -$7.5 million

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	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 to 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.	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.	1,000 ADM: 3.0 administrative and 4.0 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM. 2,000 ADM 4.0 administrative and 8.0 classified positions. Position counts prorated down linearly between 2,000 to 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.	32 Classified or Clerical Position FTEs $5.0 million

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	Position counts prorated up linearly above 12,000 ADM. Non-Personnel Resources: Provide an amount equal to $400.20 per ADM for non-personnel resources.	Non-Personnel Resources: Provide an amount equal to $400.20 per ADM for non-personnel resources, with an annual ECA.	Position counts prorated up linearly above 12,000 ADM. Non-Personnel Resources: Provide an amount equal to $378.78per ADM for non-personnel resources, with an annual ECA (2020-21 amount estimated at $400.26)	-$18,904
24. Transportation	100 percent state reimbursement.	100 percent state reimbursement.	100 percent state reimbursement.	None
25. Food Services	Assumed to be self-supporting but if Legislature seeks to subsidize food services it should be on a mealtimes rate basis	Assumed to be self-supporting	Assumed to be self-supporting	None

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
RESOURCES FOR STRUGGLING STUDENTS				
26. At Risk Tutors	Provide 1.0 tutor position for every 125 at-risk students.	Provide 1.0 tutor position for every 100 at-risk students. Not provided for small or alternative schools.	Provide 1.0 teacher tutor position for every 125 at-risk students.	-58 At-Risk Tutor FTEs **Total cost estimate provided above in element 8** *Note: Net increase in total tutors of 131 FTEs, when accounting for both Core (Element 8) and At-Risk tutors (Element 26). EB Model generates 302.6 core tutors and 287.6 at risk tutors.*
27. Pupil Support	Provide 1.0 at-risk pupil support position for every 125 at-risk students.	Provide 1.0 at-risk pupil support position for every 100 at-risk students. Not provided for small or alternative schools.	Provide 1.0 at-risk pupil support position for every 125 at-risk students.	-88 FTEs -\$6.9 million (75%) -\$4.4 million (85%)

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
28. Extended Day Programs	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.	For both extended-day and summer school programs, funding was rolled into the block grant and provides 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 upon the district's at-risk count. In 2017, the funds remained the same but were "rolled into" the block grant and are no longer a categorical program.	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.	212.5 FTE $13.0 million (75%) $15.6 million (85%)

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
29. Summer School Programs	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.	For extended-day and summer school programs, funding in 2017 was rolled into the block grant & provides 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 upon the district's at-risk count.	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.	212.5 FTE $13.0 million (75%) $15.6 million (85%)
30. English Language Learner (ELL) Students	Provide 1.0 ELL teacher position for every 100 ELL students.	Provide 1.0 ELL teacher position for every 100 ELL students. Not provided for small or alternative schools.	Provide 1.0 ELL teacher position for every 100 ELL students.	No FTE Difference $0.02 million (75%) $0.33 million (85%)
31. Alternative Schools	No separate formula. Fund as any other school.	Provide funding for all staff at a ratio of 1.0 assistant principal plus 1.0 teacher position for every 7 ADM.	No separate formula. Fund as any other school.	Cost Differences Allocated in Elements Above

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
32. Salary Levels	Accept Legislative Model salaries as cost-based and used in the 2015 EB Model. Additionally, continue the labor market monitoring process currently in place.	Superintendent: Base salary $80,155; Bachelor's premium $19,311; Master's premium $25,578; Doctorate's premium $30,791; State experience per year premium $215; District per ADM premium $4.29. Assistant Superintendent: 80% of Superintendent. Business Manager: Base salary $44,037; Bachelor's premium $19,311; Master's premium $25,578; Doctorate's premium $30,791; State experience per year premium $215; District per ADM premium $4.29. Principal: Base salary $74,330; Doctorate's premium $8,593; State	Use average salaries for staff positions, rather than salaries adjusted by education and experience for the following positions: Superintendent: $130,400 Assistant Superintendent $104,320 at 80 percent of superintendent Business Manager: $85,240 Principal: $102,000 Assistant Principal: $84,900 Teacher: $54,500 (75%); or $61,700 (85%) School Computer Technician: $50,500	No FTE changes related to salary level differences, cost differences reported by category above

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
		experience per year premium $645; School per ADM premium $14.68. Assistant Principal: Base salary $60,459; Doctorate's premium $8,593; State experience per year premium $645; School per ADM premium $14.68. Teacher: Base salary $38,404; Master's premium $6,395; Doctorate's premium $13,953; Experience per year premium for 20 years or below $876; Experience per year premium for above 20 years $227. School Computer Technician: Base salary $39,873; Bachelor's or above premium $13,758;	Supervisory Aide $22,700 School Secretary: $33,600 School Clerical: $31,900 Central Office Classified: $44,100 Central Office Maintenance Worker: $44,300 Custodian and Groundskeeper: $30,100	

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
		State experience per year premium $665. Supervisory Aide: Base salary $17,556; Bachelor's or above premium $2,044; State experience per year premium $282. School Secretary: Base salary $29,770; State experience per year premium $411. School Clerical: Base salary $22,903; State experience per year premium $316. Central Office Classified: Base salary $32,330; State experience per year premium $411. Central Office Maintenance and Operations: Base salary		

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
		$32,595; State experience per year premium $483. Custodian: Base salary $26,462; State experience per year premium $483.		
34. Health Insurance	Compute a health insurance composite amount for each generated FTE based upon 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. For SY 2020-21 the per FTE amount is $18,298.00.	Compute a health insurance composite amount for each generated FTE based upon school year 2019-20 levels, $16,876.60. Limit additional increases for the FY 2020-2021 biennium to funding model positions that participate in school district health insurance plans and 50% of the increase to funding model positions that do not participate in school district health insurance plans. Health insurance calculations are based upon prior year statewide average district weighted	Compute a health insurance composite amount for each generated FTE based upon 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. For SY 2020-21 the per FTE amount is $18,298. No health insurance for summer	*Note: there is a difference of -$11.0 million in the EB cost estimate because the EB model assumes Summer School and Extended Day teachers are the teachers currently employed by the district and thus already receiving health insurance. The Legislative model funds health insurance for these two programs, but it is not included in the Summer School and Extended Day*

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	Amount in this column has been inflated to levels in the Legislative Model and 2020 EB Recommendation columns.	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. For SY 2020-21 the per FTE amount is $18,298.00.	school or extended day positions.	*elements of the EB model.*
35. Benefits	<u>Worker's Compensation</u>: 0.70% of salary. <u>Unemployment Insurance</u>: 0.09% of salary. <u>Retirement</u>: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and State decide on reimbursement	<u>Worker's Compensation</u>: 0.70% of salary. <u>Unemployment Insurance</u>: 0.06% of salary. <u>Retirement</u>: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and reimburse actual	<u>Workers' Compensation</u>: 0.70% of salary. <u>Unemployment Insurance</u>: 0.09% of salary. <u>Retirement</u>: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and	$0 *Note: estimate is variable to salary and FTEs* $0

Model Element	2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated FTE Staff and Cost Difference between 2020 EB Model and Legislative Model
	of additional retirement costs currently reimbursed (1.25% employer share and 0.375% employee share – FY 2016-17 only). Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	expenditures as required by current law (FY 2020 1.75 percent; FY 2021, 2.00 percent, FY 2022 and beyond 2.25 percent). Employee share not paid by State: FY 2020 3.18 percent, FY 2021 3.43 percent, and FY 2022 and beyond 3.68 percent. Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	reimburse actual expenditures as required by current law. Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare). Social Security limited to federal amount, currently $137,700.	$0

**Note that the Legislative Model provides separate funding for alternative schools as "small schools" whereas the EB model resources alternative schools as any other school. A majority of alternative schools will not see a difference in funding as they contain 49 or fewer ADM. As a result, the bulk of the Legislative Model's staffing of teachers and assistant principals for alternative schools appear as staffing for small schools for the EB Model.

STAFFING FOR CORE PROGRAMS

This section of the report covers full-day kindergarten, core teachers, elective/specialist teachers, minimum teachers, substitute teachers, instructional facilitators/coaches, core tutors, core guidance counselors, core nurses, substitute teachers, supervisory aides, librarians, principals/assistant principals, and school secretarial and clerical staff.

1. Full-Day Kindergarten

The table below shows the 2015 and 2020 EB recommendations and the Legislative Model for full-day kindergarten. Details on the staffing resources kindergarten students generate are included in the sections below.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
Full-day kindergarten provided.	Full-day kindergarten provided. At least one school in each district must have a full-day kindergarten program.	Full-day kindergarten provided.	None

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Though most states allow all districts to provide a full-day kindergarten program and count those students as 1.0 pupil in the funding formula, some do not, supporting only a half-day kindergarten program and counting kindergarten students as just a 0.5 pupil for the state aid program.

In the following, the report discusses the impact of studies in terms of “effect sizes.” Effect size is the amount of a standard deviation in higher performance that the program produces for students who participate in the program versus students who do not. An effect size of 1.0 indicates that the average student’s performance would move from the 50th to the 83rd percentile. A major issue in education is how to interpret the effect size – is it low, medium or high? Decades ago, when this issue was raised, treatments tended to be small scale interventions – several students in a laboratory environment. At that time estimated effects were often substantial, sometimes greater than 1.0 standard deviation (SD). Benchmarks for understanding effect size were established in 1969 (Cohen, 1969). Cohen posited an effect size of 0.2 as Small, 0.5 as Medium, and 0.8 as Large. During the past two decades, however, when education treatments have been conducted on a much larger scale – often using thousands of students across scores of schools and dozens of districts – effect sizes have been smaller (Kraft, 2020). Moreover, such studies today compare a new program treatment to an existing program treatment, whereas in the past the new program treatment was compared to no treatment at all;

the result predictably has been smaller effect sizes. Hundreds of randomized controlled trials (RCT) in education have been conducted in recent years with effect sizes almost always below 1.0. Kraft (2019) argues that new benchmarks are needed to assess the importance of the effect produced. Kraft proposes the following benchmarks for effect sizes from causal studies of PreK–12 education interventions evaluating effects on student achievement: less than 0.05 is Small, 0.05 to less than 0.20 is Medium, and 0.20 or greater is Large. These proposed benchmarks were based on the distribution of 1,942 effect sizes from 747 RCTs evaluating education interventions with standardized test outcomes. Readers of this document are encouraged to consider these benchmarks in assessing the various research impacts reported on the elements of the EB Model.

Research shows that full-day kindergarten, particularly for students from low-income backgrounds, has significant, positive effects on student learning in the early elementary grades (Cooper et al., 2000, 2010; Fusaro, 1997; Gullo, 2000; Slavin, Karweit & Wasik, 1994). In a late 1990s meta-analysis of 23 studies comparing the achievement effect of full-day kindergarten to half-day kindergarten programs, Fusaro (1997) found an average effect size of +0.77, which is substantial. That same year a randomized controlled trial study (Elicker & Mathur, 1997) found the effect of full-day versus half-day kindergarten to be about +0.75 standard deviations. A mid-2003 study by the National Center for Education Research (Denton, West, & Walston, 2003), using nationally-representative, longitudinal data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS–K), showed children who attended full-day kindergarten had a greater ability to demonstrate reading knowledge and skill than their peers in half-day programs, across the range of family backgrounds. This study also found that the more children were exposed to literacy activities in the home, the more likely they were to perform well in both kindergarten and first grade. Children participating in full-day kindergarten programs do better in learning the basic skills of reading, writing, and mathematics in the primary grades than children who receive only a half-day program or no kindergarten at all (see also Lee, Burkam, Ready, Honigman & Meisels, 2006). Cooper, et al.'s (2010) comprehensive meta-analysis reached similar conclusions finding the average effect size of students in full-day versus half-day kindergarten to be +0.25.

Research in the past several years has reinforced these findings. Hahn, et al's (2014) research review concluded that that full-day kindergarten improved academic achievement by an average of 0.35 standard deviations over students receiving only a half day program, with the effect being 0.46 for verbal achievement and 0.24 for math. Gibbs (2017) studied a natural experiment in Indiana that randomly assigned students to full-day kindergarten. The results showed significant gains in literacy skills associated with students placed in full-day kindergarten, with the impacts being even greater for "Hispanic" students. Thompson and Sonnenschein (2016) concluded that full-day kindergarten students (as compared to half-day students) had a higher chance of having early word reading skills by the end of kindergarten, which also predicted their higher reading scores in elementary schools. Early word attainment also helped to decrease the demographic related reading gaps. In a 2018 cost benefit study, Ramon, Barnett and Hahn (2018) calculated that, accounting for both the program costs and calculated economic returns, full-day kindergarten programs had a higher net benefit than half day programs, with net benefits being decreased childcare costs, reduced grade retention and remedial education, and increased maternal employment and income. Finally, just last year, Pelletier and Corter (2019) found in the province of Ontario, Canada, that full-day participation improved student self-regulation, reading, writing, and number achievement long past kindergarten.

In part as a result of these consistently positive research findings on the impacts of full-day versus half day kindergarten, the EB Model supports a full-day kindergarten program for all students. Further, funding full-day kindergarten for 5-year-olds as well as for 4-year-olds became an increasingly common practice among the states by the early 2000s (Kauerz, 2005). Since research suggests children from all backgrounds can benefit from full-day kindergarten programs, the EB Model supports a full-day kindergarten program for all students.

PJ Panel Comments on Full-day Kindergarten

Most panelists strongly supported full-day kindergarten; they also supported the inclusion of preschool in the model – if not for all students, then at least for at-risk students. In fact, many panelists described current district approaches to providing preschool and also described several schools' approaches to offering "junior kindergarten programs" for "young" five-year old children as well as other five-year old children who were not fully ready for kindergarten, which would delay their entering a regular kindergarten program for a year. To support their recommendations for full-day kindergarten and for expanding into the preschool years, panelists pointed to research and their own experience regarding the importance of early childhood and kindergarten education for the development of literacy skills in elementary school. They noted that kindergarten curriculum is becoming more academic, and they argued that students who do not engage in kindergarten education are missing out on curriculum and instruction that they need in order to be successful in the primary grades. Furthermore, many panelists' support for preschool and "junior kindergarten" programs rested on the idea that increasing numbers of children are entering Wyoming's schools without the requisite social, emotional, behavioral and pre-academic skills to do well in a school setting. Panelists' experience with these sorts of preschool and "junior kindergarten" programs in various locations around the state led them to argue that these programs can prepare struggling students for a more successful entry into kindergarten. A number of panelists indicated that their districts currently had preschool programs for at least some of the children in their district. These programs were funded through the allocation of resources through the Legislative Model, as well as Federal sources.

In summary, there was overwhelming support for both full-day kindergarten and a preschool program as well. We did not hear any opposition to either full-day kindergarten or to funding for more preschool programs.

2020 EB Recommendation

Fund full-day kindergarten programs by counting kindergarten students as 1.0 ADM.

2. Elementary Core Teachers/Class Size

In staffing schools and classrooms, the most expensive decision superintendents and principals make is on class sizes for core teachers. Core teachers are defined as the grade-level classroom teachers in elementary schools. In middle and high schools, core teachers are those who teach the core subjects of mathematics, science, language arts, social studies and world languages. Advanced Placement (AP) or International Baccalaureate (IB) classes in these subjects are considered core classes.

In the analysis that follows, we provide information on the number of teachers employed by school districts in Wyoming as compared to the number of teachers generated through the Legislative Model. There are several factors to consider in the analysis that follows.

- The data we present on resource use come from the 2019 *Continuing Review of Educational Resources in Wyoming* (CRERW) report prepared annually by the Wyoming Department of Education (WDE).
- The data on numbers of teachers compared to the Legislative Model do not distinguish between core and specialist teachers; consequently, some comparisons below are presented in the discussion of core teachers and others following the discussion of specialist or elective teachers.
- Many of Wyoming's schools contain grade spans not easily categorized as elementary, middle or high school (e.g., K-12 schools, alternative schools, etc.). The WDE reports data for these schools as well as more traditionally organized schools. Tables presented here rely on traditionally organized schools, but tables that include the same data for all schools (as well as summarize district-by-district findings when appropriate) are provided following the discussion of specialist/elective teachers.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
Grades K-3: 15; Grades 4-5/6: 25. Average class size of 17.3 (K-5) or 18.1 (K-6).	Grades K-5/6: 16. Average class size of 16 (K-5/6).	Grades K-3: 15; Grades 4-5/6: 25. Average class size of 17.3 (K-5) or 18.1 (K-6).	-273 FTE -$19.2 million (75%) $3.8 million (85%)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Over time, different analysts have reached different conclusions on how overall resources generally, and class size specifically, impact student achievement. The gold standard of educational research is randomized experiments, which provide scientific evidence on the impact of a certain treatment (Mosteller, 1995). The primary evidence on the impact of small classes today is the Tennessee STAR study, which was a large scale, randomized controlled experiment of class sizes of approximately 15 students compared to a control group of classes with approximately 24 students in kindergarten through grade 3 (Finn and Achilles, 1999; Word, et al., 1990). The study found students in the small classes (not a class of 30 with an instructional aide or two teachers) achieved at a significantly higher level (effect size of about 0.25 standard deviations) than those in regular class sizes, and the impacts were even larger (effect size of about 0.50) for low income and minority students (Achilles, 1999; Gerber, Finn, Achilles, & Boyd-Zaharias, 2001; Finn, 2002; Grissmer, 1999; Krueger, 2002; Nye, Hedges, & Konstantopoulous, 2002; Word et al., 1990). The same research also showed a regular class of 24-25 students with a teacher and an instructional aide *did not* produce a discernible positive impact on student achievement, a finding that undercuts proposals and widespread practices that place instructional aides in elementary classrooms (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001).

Subsequent research showed the positive impacts of the small classes in the Tennessee study persisted into middle and high school years, and the years beyond high school (Finn, Gerber, Achilles & J.B. Zaharias, 2001; Konstantopoulos & Chung, 2009; Krueger, 2002; Mishel & Rothstein, 2002; Nye, Hedges & Konstantopoulos, 2001a, 2001b). Longitudinal research on class size reduction also found the lasting benefits of small classes included a reduction in the achievement gap in reading and mathematics in later grades (Krueger & Whitmore, 2001).

Although some argue the impact of the small class sizes was derived primarily from kindergarten and grade 1, Konstantopoulos and Chung (2009) found that the longer students were in the small classes (i.e., in grades K, 1, 2 and 3) the greater the impact on grade 4-8 achievement. They concluded the full treatment – small classes in all of the first four grades – had the greatest short- and long- term impacts.

Though differences in analytic methods and conclusions characterize some of the debate over class size (see Hanushek, 2002 and Krueger, 2002), we concur with those concluding class size makes a difference, but only class sizes of approximately 15 students with one teacher (and not class sizes of 30 with an aide or two teachers) and only for kindergarten through grade 3.

Finally, in these times when funds for schools are scarce, it is legitimate to raise the issue of the cost of small classes versus the benefits. Whitehurst and Chingos (2011) argue that though the Tennessee STAR study supports the efficacy of small classes, there is other research today that produced more ambiguous conclusions. They also note that this "other research" includes class size reductions in grades above K-3 and "natural experiments" rather than randomized controlled trials. Most importantly, they conclude that while the costs of small classes are high, the benefits, particularly the long-term benefits, outweigh the costs and conclude small class sizes in grades K-3 "pay their way."

If a state's average class sizes exceed the EB recommendations, we consistently recommend states fund all other elements of the EB Model before fully funding smaller class sizes. We have made this recommendation because research shows many other components of the EB Model are more cost effective in terms of improving student performance – particularly for improving the performance of struggling students.

Fractional teacher units and grouping students for instruction.

An additional issue that often emerges in applying this general formula to schools of different sizes is how to calculate the number of teachers when the number of students in a school, grade level, or class is not so neatly divided by 15, 25, or 16 and 21 as in the Legislative Model, particularly at each grade level for a school. For example, if an elementary grade had 16 students, one teacher position is provided. But what would happen if there were 19 students? Would that trigger an additional full FTE teacher, or just a small fraction of an additional teacher? We recommend that the formula trigger just the additional fraction, and that principals consider all teacher FTEs in a school when organizing a school and staffing classes. This approach provides flexibility to align classes and teachers based on the actual enrollments in the school, and in larger elementary schools can make it possible to have smaller classes in the lower grades than in the higher grades.

The issue here, as well as for very small elementary schools, is how students are grouped for instruction. If students are grouped by grade level, the fact that each grade level does not have a number of students evenly divided by 15, 16, 21 or 25 produces an issue of student placement and numbers of teachers. On the other hand, if schools adopt a multi-age approach it would be much easier to create classrooms of approximately 16 students (in Wyoming), regardless of the specific number of students in each grade. Furthermore, research shows that multi-aging of students in elementary classrooms actually is better for students. Students in multi-age classrooms achieve at least as much as students in age-grouped classes and usually learn more with effect sizes ranging from 0.0 to 0.5 (Gutierrez & Slavin, 1992; Mason & Burns, 1996; Pavan, 1992; Veenman, 1995). Moreover, the Rural School and Community Trust (Malhoit, 2005) lists the prevalence of multi-age classrooms in rural schools as one of several advantages that small, rural schools provide.

Multi-aging, though, works best if the teacher instructs the entire class as a group and essentially has a two-year curriculum that all students are taught over a two-year time period. Multi-age classrooms run as "combination" or "multigrade" classes, in which the teacher provides half a day of instruction for each grade, can be a detriment to student learning, in part because each student might receive only a half day instead of a full-day of instruction. In short, the way multi-age classrooms are taught impacts whether they are more or less effective for students.

The difference between class size and staffing ratios

The issue of class size and staffing ratios is critical to understanding how the EB model allocates resources to schools and has a substantial impact on the total cost of the EB model. In many states and school districts "staffing ratios" are computed by dividing the number of pupils by the number of core and elective teachers. The result is that a school may report a staffing ratio of 15, but average class sizes will be higher because the number of pupils was divided by both core and elective teachers. In other states and school districts, there can be even more confusion. These states report "pupil teacher ratios" that are computed by dividing the number of pupils by the number of all certified staff, including core and elective teachers as well as other certificated staff such as instructional coaches and counselors. The result is that a school may report a "pupil teacher ratio" of 12, but average class sizes will be higher because the number of pupils was divided by all certified staff. These figures are often confusing as staffing ratios, pupil/teacher ratios and class size are frequently conflated when in fact, they have different meanings.

The EB model is different in that the intent is that actual class size be 15 or 25 and all other instructional staff are resourced above that level. To show the difference imagine an elementary school with 300 students. If the school has 20 certified staff members, the pupil teacher (or more accurately pupil/staff) ratio is 15:1. But if five of the instructional staff members are not core teachers, but rather teach electives, are instructional coaches or have other responsibilities, there are only 15 core teachers and the average class size is actually 20, not the 15 that was reported.

For this reason, the EB model makes a clear distinction between staffing ratio, pupil/teacher ratios and class size. The intent is to provide positions for actual class sizes of 15 in grades K-3 and 25 in higher grades. In the example above, assuming the class size goal is 15, there would be 20 core teachers and the school would receive additional resources for elective teachers, instructional coaches, and other certificated staff. The logic is similar at middle and high schools.

Confusion on these issues has occurred because the Wyoming funding model in place during the 2005 recalibration was the MAP Model and it used a staffing ratio. Specifically, the staffing ratio was 16 for elementary schools and 21 for middle and high schools. Our 2015 recalibration report included a long section that described how the staffing ratios of the MAP model and the class sizes and elective teacher allocations of the EB and Legislative Models produced different numbers of teachers and different class sizes.

Without going into the details, the MAP elementary staffing ratio of 16 actually implied a class size of 19.2 in elementary schools and 25.2 in secondary schools. These are very similar to the average elementary class sizes for the EB model of 17.3 in a K-5 school or 18.1in a K-6 school (15 in grades K-3 and 25 in grades 4-6). The implied middle and high school class size of 25.2 is very close to the EB Model's secondary class size of 25. Put another way, if after the 2005 recalibration, if the Legislature had adopted the EB Model class size ratios together with its allocation of elective teachers, which simply made explicit the core and elective teachers of the MAP staffing ratio, it would have been essentially the same as retaining the MAP Model's staffing ratio of 16 and 21. Instead, however, the Legislature turned the "staffing ratios" of 16 and 21 into class size numbers and with elective teachers provided at the ratios of 20 percent more for elementary schools and 33 percent more for secondary schools; this policy ended up providing substantially more teachers than the EB Model. Further, as discussed below, few schools since 2005 have actually implemented class sizes of 16 elementary and 21 secondary, but instead used the additional resources to raise teacher salaries.

In the material that follows, the computations for core and elective teachers are designed to ensure that the average class size is 15 in grades K-3, and 25 in grades 4-12, not the average staffing ratio.

Resource Use

Table 3.2.6 shows elementary schools in Wyoming employed 639.7 fewer core and specialist teachers than were funded through the Legislative Model in 2018-19. This gap between the Legislative Model and the number of core and specialist teachers employed by the districts increased by 151 since SY 2013-14. As a result, average class sizes in elementary schools are higher than that provided by the Legislative Model (16 students) although the difference has not grown over the past decade. While the difference in the number of teachers between the Legislative Model and district employed teachers decreased from SY 2012-13 to SY 2013-14, with the more restrictive funding and funding increases during the past several years, this difference has risen. However, the differences are not due to those in the small and medium elementary schools, that received considerable minimum teachers, but in the large elementary schools. Further, as discussed in the next two sections, the difference between Model and Actual teachers has also increased for secondary schools.

Table 3.2.6 Comparison of Number of Teachers* in Wyoming Elementary Schools Compared to Number of Teachers Funded through the Legislative Model, SY 2018-2019

Elementary School Size Category	Number of Schools	Average ADM Per School	Difference in Number of Teachers from Wyoming Funding Model
Small (<= 49 ADM)	30	17	(6.7)
Mid-size (>49 and <=96 ADM)	8	71	(0.3)
Large (> 96 ADM)	149	288	(540.1)
All Elementary Schools	187	235	(639.7)

*Core and specialist/elective teachers.
Source: CRERW tables: sfp_crerw_staffing_table_e1; sfp_crerw_staffing_table_e2; sfp_crerw_staffing_table_e3; sfp_crerw_staffing_table_e0; sfp_crerw_adm_table3.

PJ Panel Comments on Core Class Sizes

Many panelists, particularly those from the larger districts, claimed that their actual class sizes were larger than either the Legislative Model or the EB Model, hitting 19-20 in elementary schools and in the mid-20s in middle and high schools. This reality has existed for over a decade. In general, though, most panelists supported lower class sizes and often expressed preference for the lower-class sizes of the Legislative Model (compared to the EB Model). The rationale was that "the lower the class size, the better student performance."

Despite panelists' strong preference for smaller class sizes, they offered some impediments to their schools offering smaller classes. First, several panelists from the larger districts indicated a strong preference for smaller class sizes – and they argued they could increase student performance if they had smaller classes – and they also noted that their schools did not have sufficient physical space for that to happen. This was particularly the case in districts where student enrollments were increasing.

Second, panelists noted that actual class sizes and model salaries were linked and that many districts organized larger class sizes and used the saved revenue to pay salaries at what they argued was a more competitive level. In general, panelists from larger districts supported either the EB or Legislative Model's class sizes as both were smaller than their typical actual class sizes. These individuals noted the link between class sizes and salaries and were reluctant to support the EB Model's somewhat larger class sizes as they feared that what would happen is that districts would lose teacher allocations and be forced either to cut teacher salaries or further increase class sizes – an outcome none of them felt would be helpful to student learning. Several said they would support the EB Model's class sizes if they knew that model salaries would be increased.

2020 EB Recommendation

The EB Model continues to recommend class sizes of 15 in grades K-3, and 25 in grades 4-12. These elementary core class sizes produce schoolwide average class sizes of 17.3 for a K-5 school and 18.1 for a K-6 school.

3. Secondary Core Teachers/Class Size

In middle and high schools, core teachers are those who teach core subjects such as mathematics, science, language arts, social studies and world languages. Advanced Placement (AP) and International Baccalaureate (IB) classes in these subjects are considered core classes.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
Grades 6-12: 25.	Grades 6-12: 21.	Grades 6-12: 25.	Middle school: -149 FTE -$11.6 million (75%) -$4.6 million (85%) High school: -158 FTE -$11.7 million (75%) -$2.4 million (85%)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Evidence on the most effective class sizes in grades 4–12 is harder to find than is evidence for the early elementary grades, because most of the research on the effects of class size has been conducted at the elementary level. As a result, in developing the EB Model, we seek evidence on the most appropriate secondary class size from typical and best practices to identify the most appropriate class size for these grades. The national average class size in middle and high schools is roughly 25 students. Nearly all comprehensive school reform models were developed on the basis of a class size of 25 students (Odden, 1997; Stringfield, Ross & Smith, 1996) a conclusion on class size reached by the dozens of experts who created these whole-school design models. Although many professional judgment panels in many states have recommended secondary class sizes of 20, no individual in a panel we have coordinated cited research or best practices to support proposals at class sizes that small.

Citing a few studies, Whitehurst and Chingos (2011) argued there might be a modest linear relationship in improving student performance when class size drops from between 25 and 30 students to 15, but our view of the evidence and impact is that the gains identified are modest at best, and insufficient to alter the EB Model class size recommendations.

Resource Use Analysis

The EB Model's middle and high school class size of 25 students is larger than the Legislative Model class size of 21 students. It is our understanding that the use of class sizes of 21 students in these grades evolved from an earlier adequacy study that specified 21 as a "staffing ratio" for secondary schools. The staffing ratio of 21 students per teacher was intended to include all teaching staff and did not distinguish between core teachers and elective teachers. If one assumes 21 is a "staffing ratio" and includes core and elective teachers, and if one further assumes each teacher provides instruction for five of six instructional periods of the regular school day, then the staffing ratio of 21 translates to a core class size of about 25.2, essentially equal to the EB Model ratio of 25. But the EB Model adds 20% (middle schools) and 33 1/3% (high schools) more elective teachers (as described below), and the Legislative Model adds 33% (middle schools and 33% (high schools), as elective teachers. As a result, both the EB Model and the Legislative Model provide more teacher resources than the funding model that was in place before the 2005 recalibration.

Table 3.3.1 below displays the difference in the number of teachers generated by the Legislative Model and the number of teachers actually employed by school districts in middle and high schools. Data are presented for all middle and all high schools as well as by school size categories. For both middle and high schools and across all size categories, districts employed fewer teachers than the Legislative Model allocates. Specifically, across all middle schools in Wyoming there were 108.1 fewer teachers than the Legislative Model funds. At high schools, there were 109.5 fewer teachers than the Legislative Model funds. These numbers are larger than they were in years prior to SY 2017-18 which is the time when education funding became somewhat restricted. Moreover, the differences are largely due to differences in the large middle and high schools.

Table 3.3.1 Comparison of Number of Teachers* in Wyoming Middle and High Schools Compared to Number of Teachers Funded Through Legislative Model, SY 2018-2019

Secondary School Size Category	Number of Schools	Average ADM Per School	Difference in Number of Teachers from Legislative Model
Middle Schools			
Small (<= 49 ADM)	8	23	(5.9)
Mid-size (>49 and <=105 ADM)	8	78	(22.0)
Large (> 105 ADM)	39	446	(80.2)
All middle Schools	55	334	(108.1)
High Schools			
Small (<= 49 ADM)	5	24	(0.6)
Mid-size (>49 and <=105 ADM)	8	79	(12.2)
Large (> 105 ADM)	39	576	(105.0)
All High Schools	52	446	(109.5)

*Includes both core and specialist teachers
Source: CRERW Tables: sfp_crerw_adm_table4; sfp_crerw_adm_table5; sfp_crerw_staffing_table_h0; sfp_crerw_staffing_table_h1; sfp_crerw_staffing_table_h2; sfp_crerw_staffing_table_h3; sfp_crerw_staffing_table_m0_2-7-2020; sfp_crerw_staffing_table_m1_2-7-2020; sfp_crerw_staffing_table_m2_2-7-2020; sfp_crerw_staffing_table_m3_2-7-2020.

PJ Panel Comments on Core Class Sizes

Panelists universally supported smaller class sizes as a way to achieve gains in student performance, and as a result tended to prefer the ratio of 21:1 in the Legislative Model to the 25:1 in the EB model. Many commented that actual class sizes exceeded the model class sizes often extending to as many as 20-23 students per class, and sometimes more. They expressed concern that if the EB ratio of 25:1 was used, class sizes would increase further and worried they would approach 30. Many also argued that the lower ratio of 21:1 provided more flexibility to offer smaller elective courses, which several participants said would help keep students in school through elective courses that the students wanted to take. There was widespread agreement that in the larger districts, class sizes always exceeded the Legislative Model's ratio of 21:1.

A number of PJ panel members argued that if the size of average classes increased, it would lead to greater grading burdens and might lead to fewer assignments, which they argued would not be good for increasing student performance. This was of particular concern for writing classes.

Several panelists noted that the salaries paid to teachers exceeded the salary allocations in the Legislative Model, arguing that districts had to increase class size to pay the higher salaries. They argued that rather than increase class size, the model should increase funding for teacher salaries. Absent that, there was a general view that they would rather have larger classes and higher salaries, saying a good teacher with more students is better for improved student learning than is a smaller class with a moderately effective teacher.

Additionally, panelists argued that more teachers in a school allowed for more variety in class offerings in the secondary schools. Much of the discussion seemed to focus on different things the schools were actually doing, rather than making a recommendation for which model they supported more strongly.

Arguments were also presented that in some districts, classrooms were built to hold 21 students in secondary schools, and if more students were enrolled in classes in those rooms, there would not be adequate space.

Despite all of these concerns, most participants seemed to feel that even a ratio of 25:1 would be acceptable if class sizes were close to 25 and did not expand.

2020 EB Recommendation

Secondary core class sizes, grades 6-12 of 25.

4. Elective/Specialist Teachers

In addition to core classroom teachers, the EB Model provides elective or specialist teachers to support core teachers. Generally, non-core or elective teachers, also called specialist teachers, offer courses in subjects such as music, band, art, physical education, health, career-technical education, etc. A combination of core and elective teachers has two purposes. The first is to allow schools to offer a full, liberal arts curriculum program with adequate courses outside the core, all of which are needed to cover the education basket. The second is to provide time during the school day for *all* – core and elective – teachers to collaborate on instructional plans, participate in professional development activities and otherwise plan for class instruction. The following table displays the allocation of elective or specialist teachers to elementary, middle and high schools through the EB and Legislative models.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
Elementary Schools			
20% of core elementary school teachers.	20% of core elementary school teachers.	20% of core elementary school teachers.	-55 FTE -$3.8 million (75%) $0.8 million (85%)
Middle Schools			
20% of core middle school teachers.	33% of core middle school teachers.	20% of core middle school teachers.	-151 FTE -$12.4 million (75%) -$11.0 million (85%)
High Schools			
33 1/3% of core high school teachers.	33% of core high school teachers.	33 1/3% of core high school teachers.	-49 FTE -$3.6 million (75%) -$0.5 million (85%)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

In addition to the core subjects addressed in Section 3 above, schools need to provide a solid well-rounded curriculum including art, music, library skills, career-technical education, and physical education, in order to allow schools to meet Wyoming's common core of knowledge areas (W.S. 21-9-101(b)(i)) of: fine and performing arts, physical education, health and safety, humanities, career/vocational education, and computer science. The April 2017 issue of *Phi Delta Kappan* discusses many issues related to the importance of art and music for our public schools. Teachers also need some pupil-free time during the regular school day to work collaboratively and engage in job-embedded professional development.

Assuming a day is divided into six one-hour periods, providing every teacher with one period a day for collaborative planning and focused professional development requires an additional 20% allocation for elective teachers over core teachers. Using this elective staff allocation, every teacher – core and elective – would teach five of six periods during the day, and have one period for planning, preparation and collaborative work. One of the most important elements of effective collaborative work is team-focused data-based decision making, using student data to improve instructional practices, now shown to be effective by a *randomized controlled trial* (Carlson, Borman & Robinson, 2011).

When teachers work in collaborative teams, they review student data to design standards-based lesson plans and curriculum units, identify interventions for struggling students, and monitor all student progress toward meeting performance standards. Collaborative teams were identified as keys to improving student performance by several Wyoming educator panels during our 2015 recalibration work, and in the case studies that are part of this recalibration (see Hoyer, 2020). Moreover, research supports the importance of teacher collaborative work. As noted in Chapter 2 collaborative teacher teams are key ingredients in schools producing both large gains in student performance, and, significant reductions in achievement gaps for at-risk students.

Economists Jackson, and Bruegmann (2009), calling teacher collaboration "peer learning," found that such teacher collaborative activities were related to student learning gains. In a *randomized controlled trial,* Carlson, Borman & Robinson (2011) found that when collaborative teacher teams engaged in data-based decision making by analyzing student data to improve instruction the result was often higher student achievement. Jensen (2014) showed how integrating "professional learning" into the lives of teachers is a core element of high performing schools in Australia. Ronfeldt et al. (2015) found that teachers working in collaborative groups boosted student learning over a two-year period in the Miami-Dade school district. Johnson, Reinhorn & Simon (2016) found that six high-poverty schools in one urban district that had achieved the highest state rating, made teacher teams the central component of its schoolwide improvement strategies and that a key condition was ensuring that the school schedule provided regular, reliable meeting times for teams.

Using a data base similar to the Miami-Dade data base, Sun, Loeb and Grissom (2017) found that when a more effective teacher becomes part of a teaching team, the performance of other teachers improves, and the performance of the more effective teacher does not drop. This finding suggests that teacher collaboration can be enhanced when the system strategically ensures that each teacher team has a highly effective teacher as a member.

Berry (2015-16) synthesizes several studies of how teacher collaborative work is linked to student learning in many U.S. schools. Boudett and Steele (2007) provide several examples of how data-based decision-making teachers can be organized and scheduled in schools. Finally, studying school improvement strategies across hundreds of low performing schools in Washington, Sun, Shu and LeClair (2019) found that teachers using student data to improve instruction and target interventions, produce substantial achievement gains.

In sum, there is wide ranging research from scholars across the country documenting how teacher collaborative teams can work to improve instructional strategies that boost student learning. Making time during the regular school week and day requires a combination of core and elective teachers. As a result, the EB model includes both core and elective teachers, making it possible for schools to offer a full liberal arts curriculum and to enable all teachers to engage in collaborative work with their peers during the regular school day and week.

The 20% additional staff is adequate for elementary and middle schools, but the EB Model establishes a different argument for high schools. If the goal is to have more high school students take a core set of rigorous academic courses, and learn the course material at a high level of thinking and problem solving, cognitive research findings suggest that use of longer class periods, such as those made available through the use of a block schedule, is a better way to organize the instructional time of a high school. (Bransford, Brown and Cocking, 1999; Donovan & Bransford, 2005a, 2005b, 2005c). Typical block scheduling for high schools includes four 90-minute blocks a day where teachers provide instruction for three of those 90-minute blocks and have one block – or 90 minutes – for planning, preparation and collaboration. This schedule requires elective teachers at a rate of 33 1/3% of the number of core teachers. This block schedule would operate with students taking four courses each semester attending the same classes each day, or with students taking eight courses each semester while attending different classes every other day. Such a schedule could also entail a few "skinny" blocks (45-minute periods) for some classes. Each of these specific ways of structuring a block schedule, however, would require an additional 33 1/3% of the number of core teachers to serve as elective teachers to provide the regular teacher with a "90-minute block" for planning, preparation and collaboration each day.

It should be noted that staffing recommendation for high schools would be sufficient for high schools to provide all students with a rigorous set of courses throughout grades 9-12, and an appropriate number of credits required for high school graduation to qualify for Hathaway scholarships or be college ready for any post-secondary institution in the country.

Most school districts around the state require a 7.5-hour workday for teachers. Instruction usually comprises six hours of this time, and lunch 30 minutes, leaving 60 minutes for student arrival and departure and possible teacher collaborative time. A 7.5-hour teacher day together with the core and elective provisions of the EB model provide ample resources for districts and schools to provide time for teacher collaborative teams to meet regularly and often during the regular school day.

It should be noted the elective teacher recommendation described above does not provide sufficient resources, at the same class sizes, for either middle schools or high schools to offer a 7-period day where teachers instruct for only 5 of those periods. The EB Model does not resource schools at that level for two primary reasons. First, the EB Model formulates recommendations on strategies and resources to dramatically improve student performance in the core subjects of reading/English/language arts, mathematics, science, history/geography and world languages, in part by providing nearly an hour of instruction in each of these subjects daily. Restructuring the day to add a seventh period is usually accomplished by reducing the minutes of instruction in core subjects, and thus is not a strategy that is likely to boost performance in those subjects, regardless of the arguments about the motivational aspects of elective classes. Second, increasing the provision of specialist and elective teachers to 40% in both middle and high schools is more costly. As a result, a recommendation of 40% specialists and elective teachers in secondary schools would result in added costs and a potential decrease in instructional effectiveness for the core subjects, something that is not aligned with the cost-based framework that undergirds the EB approach to adequacy.

Number of elective teachers

The current EB model provides an additional 20 percent of the number of core teachers as specialist teachers in the prototypical elementary and middle school. At the high school level, the EB model provides an additional 33 1/3 percent of the number of core teachers in order to teach elective classes and also to provide time for teachers to engage in collaborative work.

Under the EB model, the 20 percent formula provides an additional 3.3 FTE positions for the prototypical 288 student K-5 elementary school, 2.5 FTE positions in the prototypical 315 student 6-8 middle school, and the 33 1/3 percent formula provides an additional 8.4 positions in the prototypical 9-12 630 student high school.

In totaling the core plus the specialist teachers from the recommendations above, the total teaching staff for prototypical schools is 20.0 FTE for a prototypical K-5 288 student elementary, 15.1 FTE for a prototypical 6-8 315 student middle school, and 33.6 FTE for a prototypical 9-12 615 student high school.

The actual number of core and specialist teachers in the Legislative Model differ from the EB model recommendations as applied to the Wyoming prototypes. A prototypical K-5 3-section elementary school with 288 students and a class size of 16 would generate 18 teachers and at 20 percent, 3.6 specialist/elective teachers for a total of 21.6 teachers.

Under the Legislative Model, a prototypical 6-8 middle school of 315 students would generate 15 core teachers and 4.95 specialists at a rate of 33 percent for a total of 19.95 teachers. A prototypical 9-12 630 student high school would generate 30 core and 10 specialist teachers for a total of 40 teachers.[1]

We note that the recommendations in other elements of the model provide a variety of additional staff for all schools. Core and specialist/elective teachers are not the only teaching staff in each school.

<u>*Providing collaborative time for teachers*</u>

Research shows that collaborative teacher work in Professional Learning Communities (PLCs) is important to a school's success. This has been confirmed by educators in Wyoming over the last decade. In order for schools to create collaborative work teams, pupil-free time must be available during the school day. Creating collaborative time (and then scheduling teachers in each team for common pupil-free time) flows from having elective as well as core teachers.

A feasible goal for a funding formula, and for organizing schools, is to create five pupil-free time periods a week to allow teachers to engage in collaborative teacher work. The Wyoming funding system does an excellent job of providing resources that would allow for this to happen, but the variation identified by the stakeholders suggests more progress can be made by school districts to ensure collaborative teacher work is a part of the school day. A seven-and-a-half-hour teacher workday provides even more options for providing collaborative time for teachers.

The Legislative Model and the EB Model provide sufficient elective staffing to allow all districts to provide teachers with five pupil-free time periods during the week to be used for collaborative teacher work. Collaborative teacher work is a key factor in moving the student achievement needle both in Wyoming and across the country. Though many districts and schools now provide for one to two of those time periods a week, it probably is time to expand the number of those collaborative work periods – as we would argue, the more teachers work in collaborative teacher teams, the more effective instructional practices are deployed, the more students learn, and the more the student achievement gaps decline.

[1] Note that the Legislative model calculates middle and high school specialists at a rate of 33%, whereas the EB model calculates specialists at the high school at 33 1/3%.

Resource Use Analysis

The previous analyses of core teachers included a comparison of the number of teachers in Wyoming, by size of school, with the number of teachers allocated to school districts through the Wyoming Funding Model. That analysis showed a substantial number of teacher positions were funded but not filled by the state's 48 school districts.

The analysis above (Element 3) comparing the model allocation to the number of teachers actually hired only included what we termed "traditionally organized" schools. There are a number of other school types in Wyoming that should be considered. In this analysis we provide information on teachers in other (not traditionally organized) schools, as well as statewide totals for the allocation of teachers across the districts.

Table 3.4.1 summarizes the differences between the number of teachers (core and specialist) generated by the Legislative Model and the number of teachers employed by Wyoming school districts in schools configured differently than traditional elementary (K-5/6), middle (6-8) and high (9/10-12) schools – using the definitions of school types used by the WDE in the CRERW report. In all four types of schools, districts employ fewer teachers than the number generated by the Legislative Model. A probable reason for this is the large number of minimum teachers the Legislative Model provides at each grade prototype (six for elementary schools, eight for middle schools and 10 for high schools). Another appears to be that salaries paid to teachers by school districts are higher than those used in the Legislative Model, meaning that fewer teachers can be hired with the dollars available.

On average K-8 and secondary schools have about one less teacher than the Legislative Model provides. Alternative schools on average have about 2.4 fewer teacher positions than the Model provides. And K-12 schools on average, have about 2.8 fewer teachers than the Model provides. Though not shown by the data in the table, it is worth noting that the average size of the K-8 schools increased from 63 in 2008-009 to 140 in 2018-19, likely making those schools more efficient to operate.

Table 3.4.1 Comparison of Number of Teachers in Wyoming Schools Compared to Number of Teachers Funded Through Legislative Model, SY 2018-2019

School Size Category	Number of Schools	Average ADM Per School	Difference in Number of Teachers from Legislative Model
K-12	9	139	(25.1)
K-8	16	140	(18.1)
Secondary	11	175	(15.3)
Alternative	21	53	(51.2)

Source: CRERW report tables: sfp_crerw_adm_table6_Updated; sfp_crerw_adm_table7_Updated; sfp_crerw_adm_table8_Updated; sfp_crerw_adm_table9; sfp_crerw_staffing_table_o1; sfp_crerw_staffing_table_o5; sfp_crerw_staffing_table_o6; sfp_crerw_staffing_table_o7.

Although the total number of teachers—core and elective – employed in districts has been lower than the number of teachers allocated through the Legislative Model every year since SY 2005-06, the difference has grown over the past five or six years. Table 3.4.2 displays the number of teachers allocated by the Legislative Model, the number employed, the difference, and the number employed as a percentage of allocated teachers for each year between SY 2008-09 and SY 2018-19. Table 3.4.2 shows districts consistently employed about 90% of the number of teachers funded by the Legislative Model until 2015-16, about the time when school funding became more restricted. In 2016-17, districts hired 87.9 percent of the teachers resourced in the Legislative Model. In the two years where funding for school districts was actually lower than it was in 2016-17, the percentage of teachers hired compared to the Legislative Model funding dropped to 84.9 percent in 2017-18 and rose slightly to 85.8 percent in 2018-19. As funding has become scarcer, districts have hired fewer teachers relative to the model's resources, dropping below the 90 percent figure that held for nearly a decade.

Table 3.4.2 Comparison of Number of Teachers in Wyoming Schools Compared to Number of Teachers Funded Through the Legislative Model, SY 2008-09 through SY 2013-2014

School Year	Number of Teachers Allocated in the Legislative Model	Number of Teachers Employed by Districts	Difference (Actual minus Allocated)	Actual as a Percent of Teachers Allocated in the Model (%)
2008-09	6,430.0	5,865.0	-565.0	91.2
2009-10	6,516.2	5,933.0	-583.3	91.0
2010-11	6,576.6	5,915.0	-661.6	89.9
2011-12	6,633.6	5,977.1	-656.5	90.1
2012-13	6,707.6	6,100.1	-607.5	90.9
2013-14	6,788.9	6,189.0	-599.9	91.2
2014-15	6,874.3	6,232.6	-641.7	90.7
2015-16	6,927.1	6,231.6	-695.6	90.0
2016-17	6,997.2	6,153.9	-843.3	87.9
2017-18	6,999.8	5,943.9	-1,055.9	84.9
2018-19	6,888.8	5,913.6	-975.2	85.8

Source: CRERW Report Table sfp_crerw_appendix_c, and computations by author.

As noted above, one possible reason Wyoming school districts employed fewer teachers than funded through the Legislative Model could be that they paid teachers higher salaries than the Legislative Model provided. Table 3.4.3 provides data that helps investigate this hypothesis. Table 3.4.3 provides the annual weighted average district salary and the annual weighted salary funded through the Legislative Model. The table shows that since SY 2008-09, two years after the Legislative Model was implemented, districts paid teachers more per year than the Legislative Model provided. Further, over the past decade the percentage districts pay teachers above the Legislative model has increased. In 2008-09, districts paid teachers 6.4 percent over the Legislative Model. That rose to 7.6 percent in 2013-14, 9.0 percent in 2016-17, and to 11.5 percent in the 2018-19 school year.

Table 3.4.3 Weighted District Average Teacher Salaries Compared to Weighted Legislative Model,[2] 2008-09 to 2018-19

School Year	Actual District Weighted Average Salary	Funding Model Weighted Average Salary	Difference (Actual minus Model)	Actual as a Percent of Model
2008-09	$54,541	$51,303	$3,238	106.4%
2009-10	$55,779	$53,095	$2,684	105.1%
2010-11	$56,047	$53,046	$3,001	105.8%
2011-12	$56,734	$53,036	$3,698	107.0%
2012-13	$56,740	$52,824	$3,915	107.5%
2013-14	$56,560	$52,567	$3,993	107.6%
2014-15	$57,390	$52,724	$4,666	108.8%
2015-16	$58,161	$54,010	$4,151	107.7%
2016-17	$58,216	$53,387	$4,829	109.0%
2017-18	$58,406	$52,535	$5,870	111.1%
2018-19	$58,891	$52,819	$6,073	111.5%

Source: CRERW Report Table sfp_crerw_appendix_a, and computations by authors

The weighted average Legislative Model salary changed very little over this time period, ranging from $51,303 in SY 2008-09 to a high of $54,010 in SY 2015-16 and then moving to $52,819 in 2018-19. It is unknown why teacher salaries increased at the rate they did between 2008-09 and 2018-19, but as Table 3.4.3 suggests, districts may have chosen to pay higher salaries and hire fewer teachers potentially raising of average class sizes.

Table 3.4.4 shows that this is only partly the case. The Table provides an analysis average class size by type of school. At elementary schools, class sizes of 19.1 are higher than the Legislative Model funding of class sizes of 16. But secondary class sizes at about 21 for both middle and high schools are consistent with the model allocation of 21. These results match the class size data for large elementary, middle and high schools (the last column in the table). Moreover, class sizes compared to the Legislative Model for large schools have been stable over the past decade. Put differently, average class sizes have not materially changed over the past decade. While the difference between actual teacher counts and Legislative Model teacher resources might partially explain how districts can pay salaries that are higher than model funds, because the difference between the Legislative Model weighted average salary and district paid weighted average teacher salaries has grown, it appears that districts also take funds from other components of the budget to increase salaries and maintain the class sizes (even if they differ from the Legislative Model somewhat).

[2] It is important to note the Legislative Model adjusts the average teacher salary for each district based on the average education and experience of the teaching staff in the district and is further adjusted for regional differences by the RCA.

Table 3.4.4 Average Class Size by Type and Size of School, SY 2018-2019

School Type	Average Class Size	Small Size School	Medium Size School	Large Size School
Elementary Schools	19.1	5.2	14.1	19.3
Middle Schools	20.7	11.0	17.1	20.9
High Schools	20.9	7.1	12.3	21.2
Alternative Schools	9.8	7.8	9.1	11.3
Secondary Schools	15.5	--	13.6	15.7
K-8 Schools	19.4	3.9	--	20.2
K-12 Schools	11.8	--	8.9	12.4

Source: CRERW Report Table sfp_crerw_class_analysis

PJ Panel Comments on Specialist/Elective Teachers

Not surprisingly, participants almost universally felt that more teacher positions in the funding model were better than fewer teaching positions. This issue only plays out in the middle schools where the Legislative Model provides 33 percent specialist/elective teachers compared to the 20 percent in the EB Model.

During our PJ panels, participants confirmed much of what we heard in the 2015 recalibration where we learned that Wyoming schools used many different approaches to identify and use time for planning and collaboration. At the elementary level, the EB recommendations provide at least one period a day, approximately 60 minutes, of pupil-free time for teachers. However, this unlikely to happen in all Wyoming elementary schools. Consequently, it is possible that teachers in schools with less collaborative time have fewer opportunities to engage in collaborative teacher work and therefore miss a key element of what it takes to move the student achievement needle. Teachers provided daily pupil-free time have more opportunities for important collaborative work.

We found that middle and high schools present many different schedules and time allotment challenges to establish time for collaborative teacher work. Some schools are organized on a seven-period day with teachers providing instruction for five periods. As compared to the Legislative Model, this requires 40 percent elective teachers over core teachers, not the 20 percent for middle schools and 33.33 percent for high schools in the EB Model, or the 33.0 percent in the Legislative Model, and as a result is more costly to implement. Other participants indicated their schools were organized using a block schedule, as the Legislative Model provides, and teachers in those schools had two 45-minute pupil-free blocks every day. They indicated this frequently happens at the middle school level as well, most frequently in smaller districts and schools were subject matter teachers often are shared between the middle and high school, particularly when they are combined into one secondary school (e.g., 7-12) or both schools are on the same campus or in close proximity.

The longer time blocks could be used for a range of collaborative teacher teams to work together, and still provide for individual planning time. Some respondents indicated their high schools had a seven-period day but required teachers to teach for six of those periods, providing only one period (45-55 minute) a day of pupil-free time.

Several small districts organized the week into 4 days of instruction, with Fridays largely used for teacher meetings, and some extra help services for students who were not engaged in sports. These districts found it even more difficult for teachers to find pupil-free time for collaboration during the four instructional days.

PJ panel participants indicated considerable differences across districts and schools in how strongly teachers were encouraged or required to use pupil-free time for collaborative teacher work versus individual planning and preparation.

Small districts and schools seemed to feel that the Legislative Model provided more flexibility to both meet all of the course offerings needed for students (particularly when teachers were shared among middle and high schools), and felt it important to have more teacher positions in the model so, if they could find qualified teachers, they could hire them for all courses. There was consistent concern expressed about the challenges of teachers getting dual certification to teach multiple subjects and that led to a feeling that they needed to hire more teachers to fill all subject needs. There was little discussion about making the teacher subject matter certification more flexible and adaptable to allowing teachers to earn multiple subject certifications as a solution to this problem. Larger districts reported fewer concerns with middle schools moving to the 20 percent elective/specialist teacher count in the EB model.

2020 EB Recommendation

Provide 33 1/3 percent elective/specialist teachers over core for high schools and 20 percent for elementary and middle schools. The challenges expressed in smaller middle schools, could largely be resolved with an improved teacher certification system, and more sharing between middle and high schools.

5. Additional Vocational/Career Technical Education (CTE) Teachers

The Legislative Model provides additional staffing to school districts for Voc-ED/CTE educational programs. The table below summarizes the current status of Voc-ED/CTE funding.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
No additional vocational education teachers resourced.	Apply an additional weighting factor of 29% to vocational education (CTE) student FTEs. Based upon weighted student count, provide an additional teacher for every 21 students.	No additional vocational education teachers resourced.	-40 FTE -$3.3 million

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

The 29 percent weight to provide lower class sizes for Voc-ED programs in Wyoming was developed by MPR and Associates in a 2002 study of vocational education in Wyoming (Klein, et al., 2002). The 29 percent weight was calculated on the basis of finding that actual SY 2001-02 vocational education class sizes in Wyoming were about 13.0 students compared to the average class size for non-vocational education classes of 16.7 students. At that time the school finance funding formula provided a high school *staffing* ratio of one teacher for every 21 students. As noted in the above discussion of Model Elements 2 and 3 on core class sizes, the staffing ratio in place at the time of the MPR study included both core and specialist teachers.

During the 2005 recalibration, the staffing ratios of 16 for elementary grades and 21 for secondary grades in the MAP model were adopted as a core class size ratio and an additional 33 percent of teachers were added to middle and high school staffing for elective classes. The new class size ratio at the high schools provided for a substantial increase in the number of high school teachers. When smaller class sizes were combined with an additional 33 1/3 percent specialist teachers, our view was that the additional 29 percent weight for CTE students was no longer necessary. However, in the 2005, 2010 and 2015 recalibrations, the Legislature elected to include the 29 percent weight, and the additional teaching positions it generates in the Legislative Model. The additional weight provided an estimated 37 teacher positions state-wide, at an additional cost of $3.1 million, using school year 2018-19 student enrollment in CTE courses.

The EB Model does not recommend any additional teachers for Voc-ED/CTE courses because our analyses (see below) of recommended class sizes for the more modern types of CTE courses – computer science, pre-engineering/computer assisted design, and the bio- and health tech programs – show that the class size provided by either the EB Model recommendation of 25 students or the Legislative Model of 21 students is adequate for these newer types of CTE programs.

Evidence and Analysis

The policy issue in resolving the question of CTE/Voc-ED class sizes is whether the State wants to continue supporting more traditional Voc-ED courses with lower class sizes or CTE courses more representative of the evolving economy. Absent a clear way to make this distinction in the funding formula, this decision would also result in smaller class sizes for the more current CTE classes – which research suggests is not needed. As described below, the growing trend in CTE offerings generally is to prepare students for work in the evolving, more technically- and higher-skilled economy, de-emphasizing the more traditional Voc-ED job skills. As a result, our conclusion is the 29 percent weight is not necessary to fully fund a strong CTE program. Stakeholders in 2015 generally agreed with us and suggested that in those few cases where for safety reasons districts felt they need smaller classes; the sense was that there is enough flexibility in the Wyoming funding model's allocation of high school teaching resources to make that possible. Another important component of CTE courses today is to support STEM programs.

According to the Wyoming Department of Education, over the past decade, vocational education, or its modern term – career and technical education – has experienced a shift in focus. Traditional Voc-ED often addressed practical, applied skills needed for wood and metal working, welding, automobile mechanics, typing and other office assistance careers, as well as home economics. Today, many argue that Voc-ED now should be Voc-tech including info-tech, nano-tech, computer-tech, bio-tech, and health-tech. Today's CTE supporters argue that Career Technical Education (CTE) should begin to aggressively incorporate courses that provide students skills for positions in the emerging and higher skill/higher wage economy that can be entered directly from high school. The American College Testing Company and many policymakers have concluded that the knowledge, skills, and competencies needed for college and for work in these higher wage, higher skill jobs are similar.

This shift in the emphasis on new job creation is reflected in Wyoming. The governor and Legislature seek to broaden the state's economy to support more high skill/high wage jobs beyond the current reliance on oil/gas/coal, tourism and agriculture. As the Wyoming Department of Education's (WDE) career and technical education office has argued, CTE is at a critical juncture in Wyoming. The new Federal Perkins Act V (Senate File 143) allows CTE to be recognized for the upper levels of the Hathaway scholarship. In addition, Wyoming business and industry often partner with schools to redesign CTE programs to create a springboard to align to CTE high skill, high wage and high demand careers in Wyoming. Funding legacy CTE programs is no longer a focus of the Federal Perkins V Act.

The WDE argues that if Wyoming is serious about educating its youth in career pathways that will allow them to earn a living and support a family, as well as create a quality life, then Wyoming must assure students have access to career exploration in middle school and junior high that leads to high quality CTE programs at the high school and postsecondary level. This paradigm shift from legacy to CTE requires sufficient funding for and support of high quality CTE. As argued below, Project Lead the Way is a CTE program that creates elementary through high school pathways to careers in engineering, computer science and biotechnology, and its costs can be covered by existing elements in the Funding Model.

High quality CTE includes many aspects. A high quality CTE program begins with a CTE or provisional industry certification (PIC) licensed teacher who is current in his or her content area and receives support to remain current in his or her content area. The program must have adequate space and access to equipment/technology that reflects what is currently being used in business and industry. The program must also offer exposure to innovative and emerging technologies while ensuring student safety. Quality programs allow students to participate in work-based learning opportunities, earn college credit through dual or concurrent enrollment while enrolled in high school, and to participate in co-curricular career and technical student organizations. High quality CTE programs also offer an integrated sequence of at-least three courses, which is required by W.S. 21-13-309(m)(v)(D) in order for Voc-ED/CTE courses to qualify for the additional 29 percent weighting. Upon completion of a quality CTE program students should be able to demonstrate their skills by attaining an industry recognized credential of value.

High quality CTE can be expensive, particularly in rural areas where student travel and virtual work-based opportunities must be provided to students. Following an initial downward trend in CTE enrollment after the initial implementation of the Hathaway Scholarship program, the state anticipates demand for CTE courses will grow in beginning in 2020. Anecdotal reports of waiting lists for courses and students being turned away due to limited space in CTE courses are emerging across the state.

The EB Model has supported high quality CTE programs since 2005. Further, there are now several emerging studies that show high quality CTE programs do have a positive impact on student learning, increasing high school graduation rates, employment after high school, and wage levels. Using data from the 1997 National Longitudinal Survey of American Youth, Kreismanm and Stangem (2020) found that students largely self-selected into vocational education and CTE courses and those courses were not dumping grounds for low achieving students as some have asserted in the past. They also found that students who took CTE courses at the upper levels – i.e., learn in depth in one area –were more likely to graduate from high school and also experienced a two percent increase in subsequent wages for each additional year of vocational education or CTE courses. Kreismanm and Stangem also found that students taking only introductory CTE courses did not experience these benefits. These findings support the current CTE and Wyoming emphasis on students' taking a sequence of CTE courses that add up to expertise and certification in a specified area.

Plasman, Gottfried, & Klasik(2020) found that over the past decade students who enrolled in CTE classes in the earlier years of high school tended to continue to enroll, thus taking more sequences of CTE courses and upping their chances of high school graduation. Similarly, Dougherty's (2016) study of career technical programs in Arkansas (see also Dougherty, Gottfried & Sublett, 2019) found that students who took three or more coherent CTE classes (a key element of high quality CTE programming) were 21 percentage points more likely to graduate from high school in four years, and 25 percentage points more likely to graduate from high school if the student was from a low-income background. These students also were more likely to attend two- and four-year colleges, to succeed in those college settings, and to earn higher wages after high school. This represents one study that shows the potential power of the

CTE approach. Importantly, the study found that such programs did not track low income students into low quality vocational or career-tech programs.

Dougherty (2018) came to similar conclusions after studying the CTE programs in Massachusetts. The study investigated the causal impact of participating in a specialized high school based CTE delivery system on high school persistence, completion, earning professional certifications, and standardized test scores, with a focus on individuals from low-income families. The results suggested that participation in a high-quality CTE program boosted the probability of on-time graduation from high school by seven to ten percentage points for higher income students, and possibly even larger effects for their lower-income peers. Dougherty notes that these impacts on high school graduation complement previous research findings that participation in high quality CTE programs produces longer term increases in earned income.

Odden and Picus (2010) identified PLTW (www.pltw.org) as a nationally prominent exemplar of high quality CTE education. Often implemented jointly with local postsecondary education institutions, employer advisory groups, and local companies that provide internships and cooperative opportunities, these programs usually feature project or problem-based learning experiences, career planning and guidance services, and technical and/or academic skills assessments. Through hands-on experience preparing students for the real world, the program is designed to develop the science, technology, engineering, computer science and mathematics skills essential for achievement in the classroom and success in college or jobs not requiring a four-year college education.

Project Lead the Way has a PreK-12 sequence in computer science, engineering and biomedical sciences. At all levels the courses and modules are designed to impart knowledge and skills, applying those knowledge and skills through a variety of hands-on projects, and then encouraging students to use that newly acquired expertise to explore additional novel problems. The sequences at all three levels are aligned to both national mathematics and reading standards, as well as the new science standards. The elementary Launch program includes 43 different modules across grades K-5/6 which, if adopted schoolwide, can be the science curriculum. Sweetwater 1 is moving in this direction and is exploring the policy of adopting PLTW at all three school levels. Sublette #1 has in the past used PLTW at elementary, middle and high school levels.

The Launch program is designed to ensure that all students are prepared for the more rigorous PLTW programs in middle school. Whether designing a car safety belt or building digital animations, students engage in critical and creative thinking, build teamwork skills, and learn to try and try again when faced with challenges. The middle school Gateway program is designed to spark a joy of discovery in science and technology areas and provides experiences in the range of paths – engineering, biotechnology and computer science -- students can look forward to pursing in more depth in high school and beyond. Students apply knowledge and skills from a variety of disciplines. By tackling challenges like designing a therapeutic toy for a child with cerebral palsy, creating their own app, or solving a medical mystery, students are empowered to make a real-world impact.

The high school program has three major areas: computer science, engineering and biotechnology. There are 11 engineering courses, four biomedical courses, and 4 computer science courses. According to the PLTW website:

- PLTW Computer Science engages students in true-to-life activities like creating an online art portal or developing problem-solving apps.
- PLTW Engineering immerses students in activities like designing a home, programming electronic devices, or exploring algae as a biofuel source.
- PLTW Biomedical Science students step into the roles of medical investigators, surgeons, and biomedical engineers.

The programs at all three levels certainly cover the algorithmic thinking and computer science areas that have been added to Wyoming's educational basket. The PreK-5 Launch program includes activities such as coding, designing a robot, developing a tablet game or rescuing a trapped zoo animal. The PLTW grade 6-8 Gateway program provides more advanced applied projects such as how to clean up after an oil spill, designing a therapeutic toy for a child with a physical disability, or solving a fictional crime. The high school computer science program involves designing computer technologies rather than just using them. The PLTW Computer Science Principles (CSP) course prepares students to take the Advanced Placement Computer Science exam. The PLTW high school program in pre-engineering includes computer aided design skills that can be used in designing homes. The biotech and biomedical sciences area can lead students in designing how to make agriculture more efficient. In 2018, PLTW was offered in more than 5,000 elementary, middle and high schools in all 50 states and enrolled over 500,000 students.

The curriculum features rigorous, in-depth learning experiences delivered by certified teachers and end-of-course assessments. High-scoring students earn college credit recognized in more than 100 affiliated postsecondary institutions. Courses focused on engineering foundations (design, principles, and digital electronics) and specializations (e.g., architectural and civil engineering, bio-technical engineering) provide students with career and college readiness competencies in engineering and science. Students need to take math through Algebra 2 in order to handle the courses in the program, which also meet many state standards for science and other mathematics classes.

It should be noted that there are clearly multiple links between STEM and the curricula of newer CTE courses, so emphasizing CTE over Voc-ed would naturally increase the number of STEM programs and classes, a Wyoming goal.

Massachusetts is scaling up Project Lead the Way (PLTW). For the first year of a six-year scale-up, Papay (2019) found that Project Lead the Way had high school student performance effect sizes of 0.14 for English/language arts, 0.16 for mathematics and 0.18 for science.

One key issue is the cost of high quality CTE programs, such as PLTW. Many districts and states believe that these new career-technical programs cost more than the regular program and even more than traditional vocational classes. But in a review conducted for a Wisconsin school finance adequacy task force, (Phelps, 2006) concluded that the best of the new career-technical programs did not cost more, especially if the district and state made adequate provisions for professional development (as teachers in these new programs needed training) and computer technologies (as computer technologies were heavily used). These conclusions generally were confirmed by a cost analysis (Odden & Picus, 2010, 2015) of Project Lead the Way (PLTW), one of the most highly rated and “expensive” career technical programs in the country. And the Washington State Institute for Public Policy found that PLTW produces benefit-cost ratios above 7, meaning that for every dollar invested in the program, $7 of benefits were produced (Washington State Institute for Public Policy, 2017).

The major cost areas for the PLTW program are class size, professional development and computer technologies. Most programs recommend class sizes of 25, which is around the median for the country, what the EB model recommends for high schools, and higher than the Legislative Model of 21 in Wyoming. The professional development and most of the computer technologies are covered by the professional development and computer allocations of the EB and Legislative Model discussed below in this report. Further, PLTW training for teachers now can be accessed in an on-line format so is available to all schools, even remote, isolated rural schools. The program also has a training program for “lead” teachers who can then train other teachers in the school or district. Some of the PLTW concentration areas require one-time purchase of expensive equipment, which could be covered by approximately $10,000 per career-technical education teacher.

In a March 2020 interview with Rachel Hill, the Project Lead the Way liaison for Wyoming’s PLTW programs, and her supervisor, Diane Lashinsky, Odden was able to confirm the cost assessment described above fits the parameters of current CTE education in Wyoming. To qualify to teach a PLTW course, the teacher must take the program’s professional development for that course, which averages about 80 hours of training for each high school course. Middle school training is 20-24 hours depending on which of the 3 course areas the instructor will teach. Professional development for elementary teachers is a 16-hour program. PLTW also trains “lead teachers” who in turn can train other teachers in the district. Ms. Hill and Lashinsky said that in some cases today, teachers from a school or district might need to travel to a more centralized location for in-person PLTW training which adds travel expenses to the professional development requirements for PLTW, but that PLTW also will send its own staff to a district for “transformational” training if a districts wants to adopt PLTW for its entire K-12 program. In 2020, as noted above, PLTW modified its training sequences to make all training available on-line. All training costs are well within the approximately $130 per ADM each district receives for ongoing training and professional development services.

Elementary and middle school programs also require students to have access to the internet and Chromebooks. As described below, Wyoming could adopt a 1:1 program for computers for students which meets this requirement, and the computer and technology element of the funding program provides for most of the technology required for PLTW.

The elementary and middle school programs require a $950 annual program participation fee per school. The high school annual participation fee for Engineering is $3,200 and $2,200 for each of Bio-medical science and computer science. If a school wants all three programs, the fee is just $5,400 a year. Instructional material costs cover consumable items, that might average $9-10 a student for a computer course focused on creating apps, up to $70 a student for a computer science course, both of which would be within the instructional materials allocation of the EB model.

Thus, short of the costliest PLTW programs, the EB and Wyoming funding models provide sufficient resources, including the approximate $10,000 per CTE teacher equipment allocation to implement most PLTW programs. An approach to ensure the resources for the costliest PLTW program is addressed next.

As Wyoming considers the level of technical resources it provides for very high cost CTE program through the funding formula, it should consider the other ways districts across the country have resolved this dilemma. In upstate New York access to the most current technologies – electrical auto mechanics, diesel repair, and media relations – has been provided through regional collaboratives working with local companies (Sawchuk, 2020). Students take classes and work on new cars at a large car dealership, gain experience on multi-media broadcasting by working in a PBS affiliate and work side by side with engineers at a large aero-space company. Students not only have apprenticeships in these companies but also learn what is happening in industries that are rapidly changing: automotive technology, media and communications, and health care. Initially, the classes were provided in the schools. But over time, the technologies became so complex that they were out of the reach of even regional cooperatives, so they decided to embed the programs and the classes at the work sites themselves, which had all the appropriate equipment and technologies. Over time the districts and the companies identified ways to structure the programs and now conclude that both the schools and the companies benefit from this collaborative effort.

PJ Panel Comments on Vocational/CTE Teachers

Participants in the PJ panels were strongly opposed to eliminating the 0.29 weight for Voc-Ed/CTE programs. They offered a number of arguments including:

- Despite the Governor's efforts to broaden the state's economy to support more high skill/high wage jobs PJ panelists argued that the traditional courses (agriculture, welding, wood and metal) were critical to local economies and a supply of trained workers was needed.

- PJ panelists also argued that Voc-ED/CTE classes helped keep students in school ensuring higher graduation rates and provided the graduates with skills so they could find jobs in their local community. They further argued that high school students wanted more "hands-on classes." They argued that traditional Voc-Ed classes were the most sought-after classes at many high schools

- Panelists argued that class sizes for traditional Voc-ED courses such as woodworking, machining, welding and auto-mechanics should be smaller than 25 or 21 and the 29 percent weight should be retained. The rationale was two-fold – both safety issues and capital requirements for these classes required fewer than 21 students in a class.

- A few PJ panelists, mostly from smaller communities agreed that more funding for Voc-Ed and CTE classes was needed at the middle school level as well.

Moderators asked if a weight of 0.15 might be a reasonable approach since many of the newer skill courses in computer technology, health technology, CAD, etc. could be provided in classes of 25 or 21 as the Legislative model funds. This idea did not receive much support in the panels where it was suggested.

2020 EB Recommendation

No additional vocational education teachers need to be resourced. Eliminate the 29 percent weight for Voc-ED/CTE classes used to provide additional teacher resources in the current Legislative Model. If the state wants to continue support for traditional vocational education courses until the shift to CTE programs is complete, it could retain, and over time, phase-out the 29 percent weight. Cover program participation fees, technology requirements and training with funds with other parts of the EB and Wyoming funding models.

6. Minimum Teacher and Staff Resources

Providing adequate teacher and staff resources for Wyoming's smallest schools has been an important consideration of all of the recalibrations conducted since the first funding model was developed in response to *Campbell*. The table immediately below summarizes the 2015 EB recommendations, the current Legislative Model and our current EB recommendations. The 2020 EB model used a somewhat different approach, establishing a set of three prototype schools and estimating adequate numbers of teachers and staff based on the school level (elementary, middle or high school) and the school's enrollment.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
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.	*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.	*Minimum Teachers* For schools with more than 49 ADM, the 2020 EB minimum teacher recommendation is seven teachers at elementary and middle schools, and nine minimum teachers at high schools. For schools with 49 or fewer ADM, resources	69 FTE for minimum number of teachers per school $6.1 million (75%) $8.6 million (85%) 47 FTE for Small School Teachers

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
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 & below, minimum teacher resources are provided on a prorated basis at 1 teacher for every 7 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, provide 1.0 assistant principal position 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	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 7 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 enrolled. *Minimum Staff (Small School Adjustment)* For elementary, middle and high schools of 49 ADM & 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. For schools with 49 or	are provided on the basis of one assistant principal position and one teacher position for every seven students, with a minimum of 1.0 teacher position. Other non-staff elements are resourced plus staff resources generated by the at-risk and ELL student counts. *Non-Teacher Staff Resources* For schools with ADM less than the highest-grade band's one-section school, provide 1.0 assistant principal position. Other non-staff elements are resourced plus staff resources generated by the at-risk and ELL student counts.	\$4.2 million (75%) \$5.8 million (85%) -14 FTE for Small District Teachers -\$1.1 million (75%) -\$1.1 million (85%)

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
	fewer ADM, all Dollar per pupil resources are provided at the school level, core and at-risk tutors, counselors and pupil support are not funded, and it is assumed the 1:7 ratio for teachers provides adequate staffing.		

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

As described in previous sections of this report, the EB and Legislative Models rely on prototypical schools to estimate resources, including staffing resources for actual schools and districts. This process works well in general for schools somewhat below the prototypical sizes but when ADM drops to a number between 100 and 150, depending on the school level and which model one is assessing, diseconomies of scale kick in and require a more focused analysis of the number and minimum number of teachers needed. In Wyoming, both the EB and Legislative Models divide these small schools into two categories, those with 49 or fewer ADM and those with more than 49 ADM. Each of these enrollment levels are considered below.

Since the 2005 recalibration, both the EB and Legislative models have staffed schools with 49 or fewer ADM with one assistant principal position and a minimum of one teacher position. As enrollment grows, additional staff resources are provided on the basis of one teacher for every seven students until a school reaches 49 ADM where it would generate seven teaching positions. This logic remains in place today although the EB and Legislative Models diverge somewhat in the allocation of additional staffing resources. Under the Legislative Model, the assistant principal and teacher positions resourced at the school are intended to provide all of the staffing for the school, whereas under the EB model, the characteristics of the students would also be used to generate additional non-teacher staff resources for struggling students including summer school and extended day teachers, at-risk tutors, at-risk pupil support staff, and ELL teachers. To place the current EB and Legislative approaches in context, a brief historical perspective is provided below.

In the 2005 and 2010 recalibrations, we recommended that for schools with fewer than 96 students at the elementary level, and 105 students in middle and high schools, non-teacher staffing resources be prorated down from the staffing of 96 or 105 student schools to the 49 ADM cut point. Minimum teachers would be resourced at the highest-ADM band for schools at rate of 3.65 in elementary schools and seven teachers for secondary schools. For schools below

49 students, staffing resources provided to schools were one assistant principal position plus one teacher for every seven students, to include all staffing needs in both the EB and Legislative Models. In the 2005 recalibration it was argued, particularly for elementary schools, this provided sufficient staffing if schools organized classrooms with students of different ages. For elementary schools, it was even argued that multi-age classrooms could be a more effective way to organize classrooms (for example, see Decotis & Tanner, 1995; Gutierrrez and Slavin, 1992; Slavin, 1987; & Pavan, 1992).

In response to the recommendation, in 2005 the Wyoming education community argued that these small schools needed more teachers than the EB model recommended. The Legislature agreed and the Legislative Model provided for minimum teacher allocation minimums of six teachers in elementary grade bands, eight in middle school grade bands and 10 in high school grade bands. These minimums remain in place today in the Legislative Model.

In addition to providing a minimum number of teachers at each school, the Legislative Model was revised during the 2010 recalibration, to include a "small district adjustment" which provides school districts with 243 or fewer ADM a minimum of one teacher at each school for every grade level ADM where students are enrolled at that school. Fall 2019 enrollment showed five districts with fewer than 243 ADM (Sheridan #3, Park #16, Washakie #2, Fremont #2, and Weston #7). The WDE website shows ADM enrolled in all grades (K-12) in all five smallest districts, indicating that each would receive a minimum of 13 teachers under the Legislative Model. In addition, these 13 teachers generate elective teachers at the rate of 20 percent of the elementary and 33 percent of the middle and high school teachers for a minimum total of 16.5 teachers in each of these districts.[3] In addition, two districts (Platte #2 with 247 students and Big Horn #4 with 254 students) had fall enrollments very close to the 243-student threshold, while the next smallest district, Fremont #24 had 377 students and is not impacted by this part of the Legislative Model.

We were also cognizant of another change in the funding environment in Wyoming. When we developed the initial EB Model in 2005, there had been considerable discussion about what constituted a "school," and we followed previous practice to design a model that minimized incentives for school districts to define buildings, such as a K-12 school, as multiple schools within the building so districts could maximize revenues.

During the July 2015 stakeholder meeting in Cody, Wyoming we discovered the WDE worked with small school districts – which often have small K-12 schools – to help them identify the best way to maximize their total revenue by establishing different grade bands and configuring their schools to maximize revenues. Given this changed approach, we developed a new minimum teacher formula to simplify computations and eliminate most, if not all potential cliff effects.

The key to the 2015 EB Model recommendation was applying the adjustment for schools below 49 ADM only to the number of teachers in the school; all other staff resources were generated based on the total ADM of the school. Dollars per student resources were not affected by this recommendation. The new approach relied on a three-step process:

[3] Note that Sheridan County #3 operates two schools and as a result generates additional minimum teachers.

Step 1: All school level staff resources are provided based on the total ADM of the school, except school administration and counselors. This includes instructional facilitators, counselors, nurses, core tutors, supervisory aides, librarians and library aides, school computer technicians and school secretarial and clerical staff. These resources are generated based on the highest-grade band enrolled in the school and prorated down from the allocation of those resources for the smallest school prototypes (96 for elementary and 105 for middle and high schools). For schools with fewer ADM than the smallest school prototypes, for the highest-grade band, the principal position is replaced by an assistant principal position that is provided to the building for any ADM below the smallest prototypes. This resolves the issue of prorating a principal between 50 ADM and the smallest prototypes, and any reverse cliff effects that might occur as funding changes from a portion of a principal at 50 ADM to a full-time assistant principal at 49 or fewer ADM. For counselors, the formula provides one counselor for every 288 elementary ADM and one counselor for every 250 middle and high school ADM, prorated down to actual school ADM regardless of school size.

Step 2: Teacher resources are provided based on grade bands (elementary, middle and high). Any grade band with 49 or fewer ADM receives teachers on the basis of one teacher per seven ADM, with a minimum of one teacher. Above 49 ADM a grade band receives a minimum of seven teachers (2015 EB Model). Under this scenario, a K-12 school with more than 49 students in each grade band would receive a minimum of 21 teachers. The minimum of seven would remain in place until the formula provides more than seven teachers (core and specialist). At a minimum of seven, this occurs at 101 ADM in an elementary grade band, 158 ADM in a middle school grade band, and 131 ADM in a high school grade band. Further, under this scenario, if the Legislature chooses to do so, it can raise the minimum teacher allocations in any or all of the grade bands, the change is simple to make in the formula, and it does not impact the allocation of other school resources, although it will have the potential to create a cliff effect at an ADM of 49 in any grade band.

Step 3: Resources for struggling students are provided to the school using the parameters of the Model using at-risk student counts regardless of the school's size – above and below 49 ADM. Schools will generate resources for at-risk tutors, ELL teachers, at-risk pupil support and summer school and extended day programs for each of the at-risk and ELL counts within the school.

This EB recommendation was not implemented by the Legislature and small schools continued to be resourced as described above and summarized in the Legislative Model column of the table at the beginning of this section.

One of the challenges the minimum teacher provisions created is revenue "cliffs" when school ADM increases from 49 to 50 or drops from 50 to 49. For K-5 elementary school grade bands, because of the Legislative minimum teacher allocation of six teachers, there is a slight increase in revenue when a district's ADM falls from 50 to 49. For middle and high school grade bands, when ADM falls from 50 to 49, there are substantial revenue declines. The opposite effects occur when ADM increases from 49 to 50.

We were asked to study this issue and recommend potential solutions in 2018. Our memo to the Legislature of September 7, 2018 is included at the end of this section. It describes in detail the analysis conducted and our recommendations. In that analysis, we identified three places where the funding model creates “kinks” in the distribution of revenue to schools:

1. The transition from small school resources to the general funding distribution model under current law.
2. The point at which distributing funding at one AP plus one teacher per seven students provides more funding than the general distribution model.
3. The point at which minimum number of teachers (6 at elementary school, 8 at middle school and 10 at high school) ends and districts are funded at regular core teachers plus elective/specialists and other certificated personnel as outlined above.

Using this information, we created several scenarios in an attempt to smooth out the funding kinks that we observed. While it was possible to substantially smooth the curves, it was not easy to create a formula that addressed each individual school’s situation. This is because of the dynamic nature of the model that provides additional staffing resources depending on the characteristics of students enrolled in the school. As a result, we recommended that rather than adjust the formulas in the model, when districts were impacted by these cliff effects, the state should effectively provide the district with a soft landing by loaning declining portions of the amount of the decline to the district over five years. This approach is outlined in the September 7, 2018 memo below.

Resource Use Analysis

The number of teachers and other staff employed compared to the Legislative Model for small schools (49 or fewer ADM and 49 to either 96 or 105 students) can be found in Table 3.6.1. The first row of the table shows the number of schools in each of the six categories. The following rows display the difference between the number of staff at each position employed by the schools in that category and the number generated by the Legislative Model. With the exception of elementary schools with between 49 and 96 ADM, all of the categories show fewer teachers than the Legislative Model provides. Similarly, with the exception of middle schools with fewer than 49 ADM, all of the librarian resources in the remaining categories employ fewer librarians than the Legislative Model provides.

There are generally more media tech staff in these small schools than the Legislative Model offers, the one exception being the eight high schools with 49 to 105 ADM. There are more pupil support staff than the Legislative Model supports in four of the six school categories, with elementary and middle schools of between 49 and 96 or 105 ADM having slightly fewer pupil support staff. There are substantially more supervisory aides then the Legislative Model includes at the elementary schools, and the difference between the Legislative Model and actual numbers of supervisory aides in the middle and high schools is relatively small, while it is only the smallest elementary and middle schools that have slightly more tutors than available through the Legislative Model. In the small schools with between 49 and 96 or 105 ADM, the number of supervisory aides is between two and three positions lower than the Legislative Model provides to those schools. Finally, there is a category called “Teacher – Not of Record.” In all cases except elementary schools between 49 and 96, there are individuals with this title which is not included in the Legislative Model. Assuming these are teachers in classroom, the numbers would slightly reduce, but not eliminate the deficit of teachers compared to the Legislative Model in five of the six categories.

Table 3.6.1
Small School Staffing Comparison: Legislative Model Compared to Actual, 2018-19*

	Elementary		Middle		High School	
Category	**49 or fewer**	**49-96**	**49 or fewer**	**49-105**	**49 or fewer**	**49-105**
Number of Schools	30.00	8.00	8.00	8.00	5.00	8.00
Teacher	-6.66	0.33	-5.94	-21.96	-0.58	-12.23
Librarian	-0.05	-1.22	0.47	-5.28	-0.48	-5.47
Media Tech Staff	2.99	1.64	0.82	0.20	0.38	-0.67
Pupil Support	2.09	-0.11	2.53	-0.81	1.89	1.76
Supervisory Aide	15.99	6.32	0.52	-2.54	1.37	-1.46
Tutor	0.17	-2.20	0.15	-2.93	-0.18	-2.85
Teacher - Not of Record	0.54	0.00	0.75	0.70	0.03	1.82

*Negative Numbers reflect fewer numbers of personnel in a category than are funded through the Legislative Model
Source: WDE CRERW Tables sfp_crerw_staffing_table_e1; sfp_crerw_staffing_table_e2; sfp_crerw_staffing_table_m1_2-7-2020; sfp_crerw_staffing_table_m2_2-7-2020; sfp_crerw_staffing_table_h1; sfp_crerw_staffing_table_h2. Accessed from WDE site on July 18, 2020.

PJ Panel Comments on Minimum Number of Teachers:

For schools with 49 or fewer ADM, PJ panelists generally felt the model provided adequate teacher resources. On panelist suggested a minimum of two teachers regardless of school enrollment, but when reminded that the model also provided the equivalent of an assistant principial at that enrollment level, realized that was likely more than needed. Panelists did discuss the challenges of providing specialist at the very small and remote schools, but other than long drive times on a weekly or biweekly basis as is currently done, there were few suggestions as to how to resolve staffing for specialized student needs in the very small schools.

The discussion surrounding the minimums was more spirited. Panelists universally felt that the minimums in the EB model were inadequate to staff small schools (enrollments between 50 and approximately 125 ADM). They described the difficulty of finding teachers to teach in small and rural areas, and the challenges of dual certification for teachers, arguing that the Professional Teacher Standards Board (PTSB) makes dual certification more difficult in Wyoming that in other states. Some argued that at the high school the minimum of ten was needed because there are ten subjects in the basket of educational goods and services.

There was considerable discussion of how teachers are shared between middle schools and high schools when the two schools share the same physical campus or are located in near proximity. This is particularly the case for elective courses. And in most cases both core and elective teachers were shared.

Overall, panelists seemed to feel the minimums in the Legislative model were more appropriate than those in the EB model and when they could identify schools with fewer teachers than the Legislative model allocated, they argued that was a function of having to pay salaries that exceeded those funded through the model.

Consideration of Alternative Approaches

In an effort to simplify the allocation of resources to small schools, and to address the issues brought forward by the PJ panels, we considered shifting to the use of prototypical schools for smaller schools with more than 49 ADM, while leaving the model untouched for schools with 49 or fewer ADM. In Appendix 6.1 below we identify the approach we used, and the minimum teacher estimates we created for six prototypes which included Schools with grades K-5; K-6; 6-8; 7-8; 9-12; and 7-12. When we started to model these minimums, we discovered a number of unintended consequences and substantial cliff effects and non-logical allocations of teachers. As a result, we returned to our original 2015 EB recommendations, but based on the feedback from the PJ panels recommend increasing the minimum number of teachers in high schools from seven to nine.

2020 EB Recommendation:

For schools with more than 49 ADM, the 2020 EB minimum teacher recommendation is seven teachers at elementary and middle schools, and nine minimum teachers at high schools.
For schools with 49 or fewer ADM, resources are provided on the basis of one assistant principal position and one teacher position for every seven students, with a minimum of 1.0 teacher position. Other non-staff elements are resourced plus staff resources generated by the at-risk and ELL student counts.

Appendix 6.1: Alternative Approach to Number of Teachers

In an effort to simplify the allocation of resources to small schools, and to address the issues brought forward by the PJ panels, we attempted to estimate minimum teacher requirements for a set of prototypical schools. For schools with 49 or fewer ADM, the recommendation of one assistant principal and one teacher for every seven ADM (with a minimum of one teacher per school) was not changed, nor did we change the recommendation that the EB Model provide additional staffing and per-pupil resources allocated on the basis of the characteristics of the students in a school building.

For schools with more than 49 students, we considered minimum numbers of teachers based on prototypical small schools, and that schools receive those minimum number of teachers by prototype until the EB Model allocations exceed the minimum, regardless of school ADM.

For schools with more than 49 ADM, we observed the variation in school configurations across Wyoming and identified six prototypes for use in funding minimum numbers of teachers for these schools. The six are elementary schools of either grades K-5 or grades K-6, Middle schools of either grades 6-8 or grades 7 and 8, high schools of grades 9-12, and secondary schools of grades 7-12. The minimums described below for these prototypes would have then been used until the EB model generated more teaching and support positions than the prototype minimum, a figure hard to compute because of staffing resources generated on the basis of student characteristics. These minimums would not generate the additional 20 or 33 percent elective teaching positions in the EB Model.

Elementary Schools

For elementary schools serving grades K-5 this model would resource seven minimum teachers, one for each grade level, and one to provide electives of art, music, physical education, etc. For elementary schools with grades K-6, this model would resource eight minimum teachers using the same logic. In all cases, the additional resources based on student characteristics would be included in the school staffing.

This minimum recommendation recognizes the importance that Wyoming educators have placed on having one teacher per grade level in small schools and ensures this is possible in schools with more than 49 ADM. It also eliminates the cliff effect of losing a teaching position when a school's ADM moves from 49 to 50. One might argue that this recommendation could be modified to one teacher per grade level where students are enrolled, plus one teacher for electives, but observation of current enrollment patterns in the smallest schools suggests this is an unlikely occurrence, and the challenges of hiring and then letting go teachers in the rare instance when there are zero students in a given grade in a school with more than 49 students would further challenge the ability of the school and district to provide the full basket of educational goods and services.

Secondary Schools

For secondary schools – 6-8, 7-12, 9-12, and 7-12 – our intent was to provide sufficient resources to allow all of the students to meet the high school graduation requirements as well as the Hathaway Scholarship Honors level high school eligibility requirements. Our estimates were based on the assumption that a middle school provides school provides six periods per day per grade, and that teachers teach five classes a day. For high schools, the model also resourced enough teachers to offer block schedules with four blocks each day and teachers teaching in three blocks, leaving one daily block for planning and collaboration. We also assumed that secondary class sizes are 25 students per the recommendation in element two (secondary class size) above.

Grade 6-8 Prototype

For a three-year 6-8 middle school assuming each student took six periods a day, and each teacher taught five, a minimum of 18 periods would need to be offered (six periods times three grades). This could be met with 3.6 teachers. However, scheduling challenges and the need to find teachers who could meet all of the subject matter requirements of a middle school suggest additional teacher resources would be needed. To offer 25 different courses in a grade 6-8 middle school, five teachers would be required for enrollments of 75 or below (25 per grade level). This seems like too few teachers (and was confirmed by the PJ panels). Thus, another way to consider this is to provide one teacher for each core subject, English/language arts, math, science and social studies. In addition, teachers would be needed to offer electives including art, music, PE, CTE and possibly others. If three additional teachers were added to cover these elective areas, that would lead to a total of seven minimum teachers in a middle school allowing the potential of offering 35 separate course sections in any year. While arguably substantially more than the minimum needed, this would also allow the school to offer multiple sections of core classes by grade if needed, and still provide a rich mix of electives. It would also ensure adequate teaching resources to meet the new computer science standards that were added to the basket of educational goods and services in 2018. A grade 7-8 middle school would generate one fewer teacher for a total of six.

Grade 9-12 Prototype

For a 9-12 high school, we assumed
the school needs to offer enough course sections to allow students to meet the Hathaway Honors eligibility requirements which include:

- 4 years of language arts
- 4 years of math
- 3 years of social studies
- 4 years of science
- 4 years of fine arts, performing arts, foreign language or career and technical education

For a total of 19 Carnegie units. School districts likely place other requirements on students for graduation from high school. The EB model provides sufficient resources to allow students to take up to eight classes, with teachers offering instruction for six – typically in a block grant model with two double periods before the lunch break and two after. This requires the capacity to offer 32 courses which six courses per teacher needs 5.4 teachers. Alternatively, using the logic described in the middle school prototype above, that a high school needs to provide for the four core subjects (4.0 teachers) plus electives, we anticipate a 9-12 high school would require five additional teachers for a total of 9.0 teachers. In addition to the four core positions, the school would need to provide for health and PE (2.0), a half time language teacher (0.5), art and music (0.5) and 2.0 CTE faculty given the demand for such classes in Wyoming.

Grade 7-12 Prototype

A secondary school serving grades 7-12 would be able to use teachers with individual subject skills across all six grades. Such a school likely would need two each of the core subject areas for eight core teachers. In addition, it would need the five additional teachers identified for the high school prototype some of whom could be “shared” with grades 7 and 8. Through sharing, it seems that grades 7 and 8 would only need 1.5 additional elective teachers for a total of 14.5 teachers (8 core, 5 high school elective and 1.5 middle school teachers).

In summary, the 2020 EB minimum teacher recommendation is to rely on prototype schools with the following minimum number of teachers:

- Grade K-5 – 7 teachers
- Grade K-6 – 8 teachers
- Grade 6-8 – 7 teachers
- Grade 7-8 – 6 teachers
- Grade 9-12 – 9 teachers
- Grade 7-12 – 14.5 teachers

Appendix 6.2: September 7, 2018 Memo on Small School Adjustments

MEMORANDUM

To: Members, Joint Education Interim Committee

From: Lawrence O. Picus, Picus Odden & Associates

Subject: **Options for Small School Adjustments in the Wyoming Education Resource Block Grant Model**

Date: September 7, 2018

Copies: Matthew Willmarth, Legislative Service Office

The purpose of this memo is to consider options for modifying the Wyoming education resource block grant model (Funding Model) to reduce the substantial changes in revenue that occur in some instances when the average daily membership (ADM) of a school or a grade band within a school changes between 50 and 49. Specifically, the goal of this exercise is to minimize potentially large revenue variations that may result from a change of one student.

The challenge with this analysis is that there are many dynamic interactions that occur related to student demographics, actual grade spans of individual schools, the compensation levels the model provides for each district, and the minimum teacher formulas in the model for schools or grade bands with more than 49 ADM. In addition, at the end of this memo we discuss the potential implications of making changes in the small school formulas on funding of alternative schools.

BACKGROUND

Under the current Funding Model, schools with 49 or fewer ADM and alternative schools, receive personnel funding based on the costs of staffing for 1 assistant principal plus 1 teacher for every 7 ADM. The staff generated at this level are all the staff a school receives through the Funding Model.

Above 49 ADM, schools are funded for personnel through the general Funding Model formulae. The staff positions resourced for these schools include:

- Core teachers (1:16 elementary school grades and 1:21 secondary school grades);
- Elective or specialist teachers (20% of core teachers elementary schools and 33% of core teachers in middle and high schools);
- Minimum teachers resourced initially through school level (or grade band) minimums (elementary schools – 6, middle schools – 8, and high schools – 10);
- Staff resources for struggling students based on counts of low income, English language learners and mobile students (grades 6-12), for additional program support, extended day and summer school; and
- Other academic support staff (school administration, tutors, instructional facilitators, pupil support, counselors, librarians, computer technicians, supervisory aides, secretarial and clerical)

The specific revenue changes that occur at different school levels are described below, including a discussion of the dynamic interactions of the various formula components. The estimated revenue changes computed assume staff compensation levels equal the statewide average and are estimated at the school level and not the grade band level. The actual revenue changes for a school district will vary based upon its own characteristics and whether the change in ADM occurs at the grade band or school level.

Elementary Schools
For elementary schools, there is a slight increase in resources when a school or grade band ADM falls from 50 to 49 under the base assumptions outlined in the paragraph above. The increase is $20,540. Similarly, there is a revenue decrease of approximately $20,540 when a school's ADM grows from 49 to 50. Given the relatively small size of the change in revenue, it appears that the current approach works well and there are few large gaps to manage.

Middle and High Schools
In both the middle and high school models, there is a substantial decline in total resources when a school or a grade band ADM falls from 50 to 49. At the middle school level, the decline is $175,898 and at the high school it is $345,579. Similarly, there are revenue increases of equal amounts when ADM grows from 49 to 50.

Observations of Existing Data
For all three school levels, there are three points where there is a "kink" in the funding distribution. Table 1 describes these "kinks" and where they occur for each school level.

Table 1. Funding Model Revenue Change Observations

	Reason for "Kink"	ADM Elementary School	ADM Middle School	ADM High School
1	Transition from small school resources model to general funding distribution model under current law	49	49	49
2	Point at which distributing funding at one AP plus one teacher per seven students provides more funding than the general distribution model (hereinafter referred to as the "crossover")	47	73	97
3	Point at which minimum number of teachers (6 at elementary school, 8 at middle school and 10 at high school) ends and districts are funded at regular core teachers plus elective/specialists and other certificated personnel as outlined above.	80	127	162

These "kinks" are a function of the dynamic interactions within the Funding Model. The largest driver of funding around these kinks is the number of teachers the Funding Model generates at a school. There are three situations where funding for an elementary, middle or high school is impacted to create the "kinks".

1. If total school ADM is 49 or fewer, teacher positions are computed at a rate of 1 teacher per 7 ADM, with a minimum of one teacher. The school also receives funding for an assistant principal.

2. If total school ADM exceeds 49, elementary schools receive a minimum of 6 teachers, middle schools receive a minimum of 8 teachers and high schools a minimum of 10 teachers, but no additional elective/specialist teachers are included in the FTE teacher count. A school with multiple grade bands with total ADM greater than 49 would receive a minimum of 1 teacher per 7 ADM for any grade band of 49 ADM or less, and for grade bands with more than 49 ADM, the grade band minimum would determine the number of teachers.

3. As total school ADM grows, once the Funding Model computes staffing levels above the minimum number of teachers (in a school or grade band as appropriate), the school receives FTE teachers at a ratio of 1:16/21 plus an additional 20%/33% for electives/specialists causing the slope of the funding line to increase (become steeper).

These computations become more complicated in schools with students in multiple grade bands (i.e., K-12, K-8, 6-12, etc.). The requirements of the Funding Model for minimum teachers are based on the ADM in each grade band and the additional staff resources allocated to a school are based on the highest-grade band using the school's total ADM. For schools with multiple grade bands and ADM within an individual grade band greater than 49 ADM, each grade band is provided the minimum teacher levels for elementary, middle and high schools. However, if the grade band has 49 or fewer ADM, the minimum teacher ratio is based upon 1 teacher per 7 ADM. For example, a K-12 school with 149 ADM could be resourced 25 minimum teachers, plus additional staff. If the elementary grade band has 49 ADM, and the middle and high school grade bands each have 50 ADM, 7 elementary teachers, 8 middle school teachers and 10 high school teachers would be resourced, plus additional staff based upon the total school ADM and other student characteristics. As the discussion below shows, predicting the impact of these dynamic factors is almost impossible, and identifying a formula to accommodate all possible enrollment options and grade spans in a school is highly complex.

OPTIONS FOR REDUCING LARGE REVENUE SHIFTS

The goal of this work is to identify potential solutions to the revenue changes that take place with marginal changes in a school's ADM. It is important to note that modifications to any of the parameters in the Funding Model will cause all the variables described above to change as well. While the revenue change that occurs between situations 2 and 3 in Table 1 is relatively modest, the revenue change that takes place between situations 1 and 2 at the middle and high school levels is, as noted above, substantial.

One of the goals of school finance adequacy is to prevent the large revenue shifts that occur in these situations and is in our estimation the real issue that needs to be addressed. Below several options are considered. The options are presented initially by school level and then a discussion of multi-grade level schools is presented. Since the changes are relatively modest at the crossover point between situations 2 and 3 (see Table 1), the focus here is on mitigating the current revenue changes between 49 and 50 ADM (between situations 1 and 2 in Table 1).

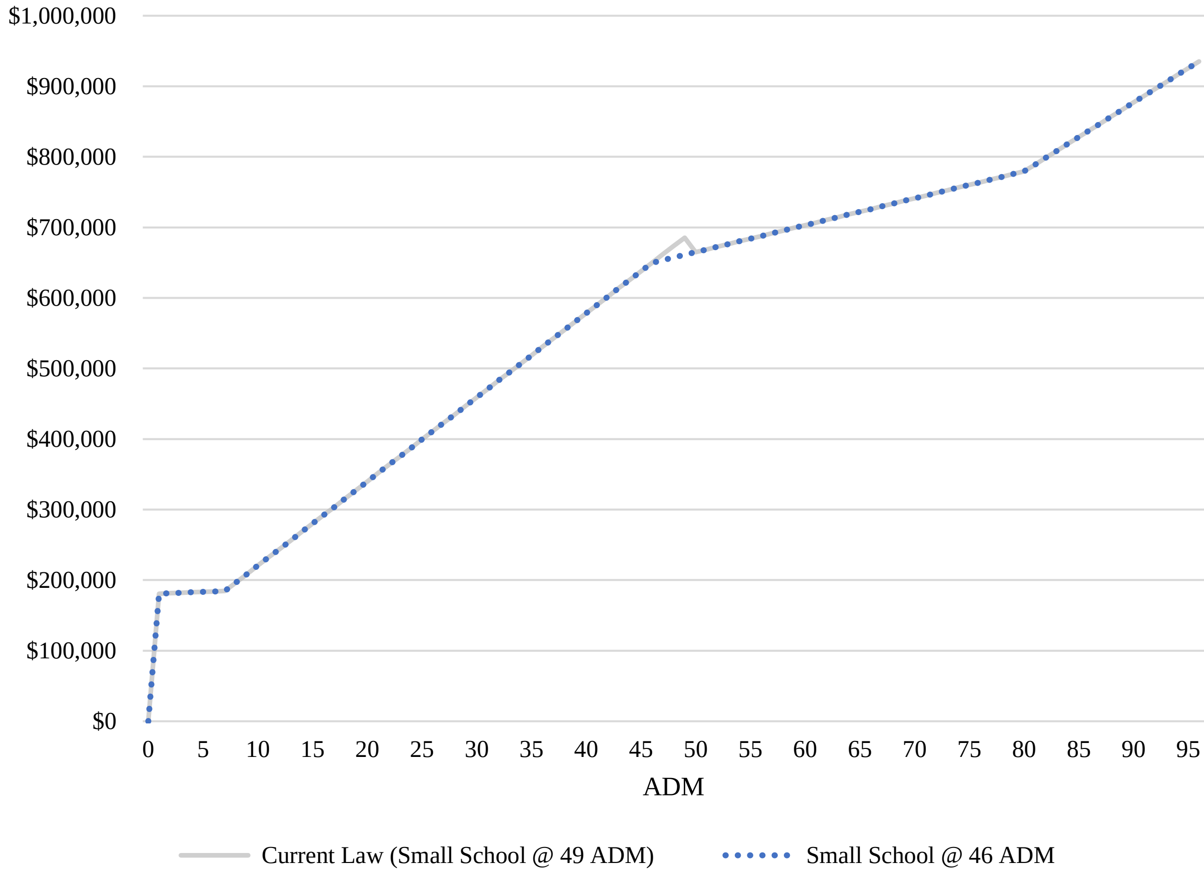
There are two variables in the Funding Model that can be adjusted to reduce the size of the revenue change between 50 and 49 ADM. One option is to modify the ratio of teachers to students in the very small schools (49 or fewer ADM), and the other is to change the ADM cut-off for transitioning from the small school formula to the general funding formula (while maintaining the minimum number of teachers in middle and high schools)[4]. A problem with changing the small schoolteacher to pupil ratio from 1:7 is that there is no research basis to reduce (or increase) that ratio.

Elementary Schools

At the elementary level, the revenue change is relatively modest – approximately $20,540 decrease when enrollment grows from 49 to 50 ADM. As shown if Figure 1, if the small school cut-off is reduced from 49 to 46 ADM, the Funding Model has a kink at 46 ADM, but the revenue drop is eliminated. The kink at 80 ADM identified in Table 1 would remain, but it would not result in reduced revenues when ADM grew from 80 to 81, but rather a faster rate of growth in per ADM funding.

[4] The analysis presented does not consider the option of changing the minimum teachers at each school or grade band. The 2015 Evidence-Based Funding Model recommended a minimum of seven teachers for each school or grade band.

Figure 1. Elementary School Scenario: Total School Level Resources

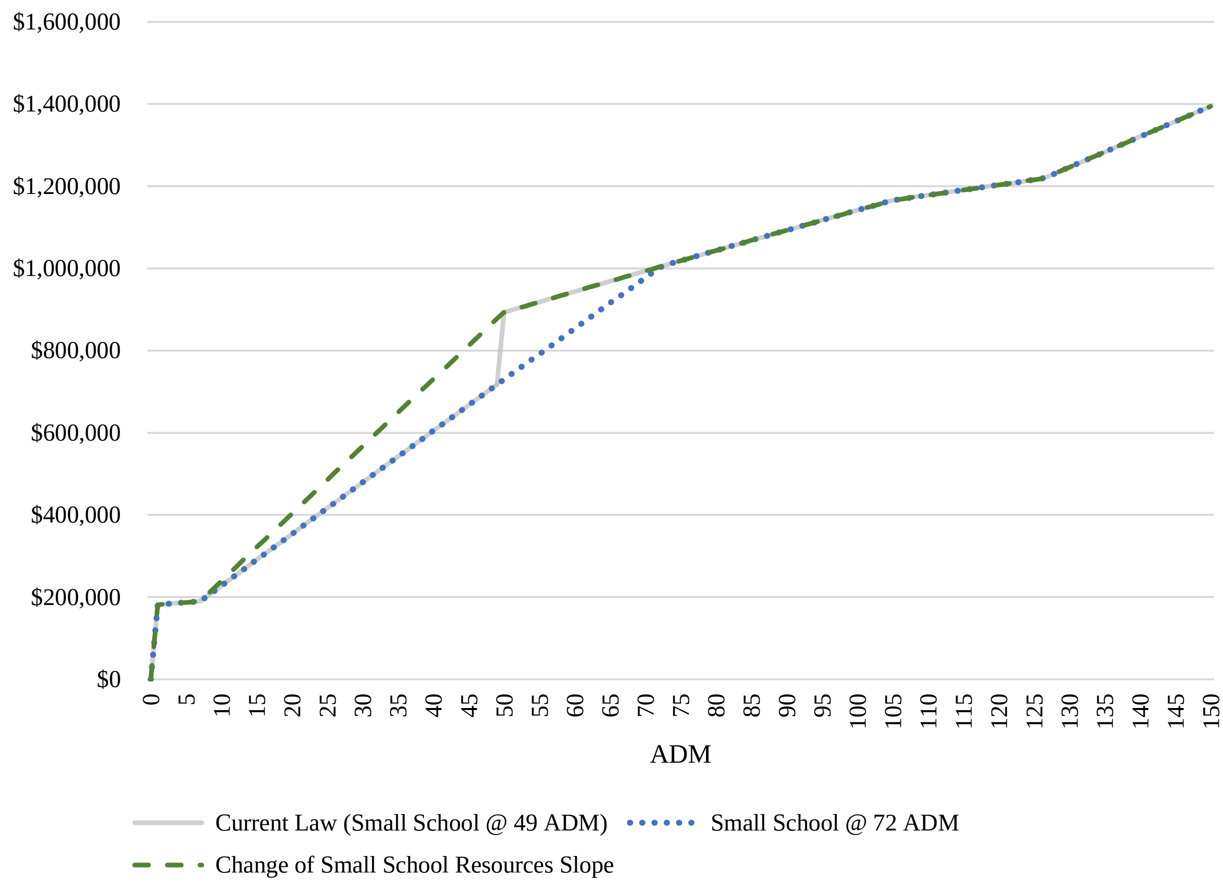


Source: Analysis of school year 2018-19 Funding Model Scenarios.

Middle Schools

The problem at the middle school is that the revenue change is substantial between 49 and 50 ADM, a total of over $175,000 – due to the minimum of 8 teachers resourced. Figure 2 displays two options for mitigating this revenue disparity. The solid gray line shows current law and the revenue change between 49 and 50 ADM. The orange dashed line shows the impact of lowering the ratio of ADM to teachers and effectively adding additional teacher funding so that the Funding Model up to the kink at 49 ADM (essentially increasing the slope of the funding line and giving all schools with more than about 5.6 ADM more funding until they reach 49 ADM). At that point, schools would be funded as they are under the current Funding Model. The blue dotted line shows what happens if the small school cut-off is shifted to 72 ADM – that is a school receives teacher resources at a rate of 1:7 up to 72 ADM and then shifts to the current Funding Model. At 72 ADM the slope of the funding line would be lower, and the kink at 49 ADM eliminated.

Figure 2. Middle School Scenario: Total School Level Resources

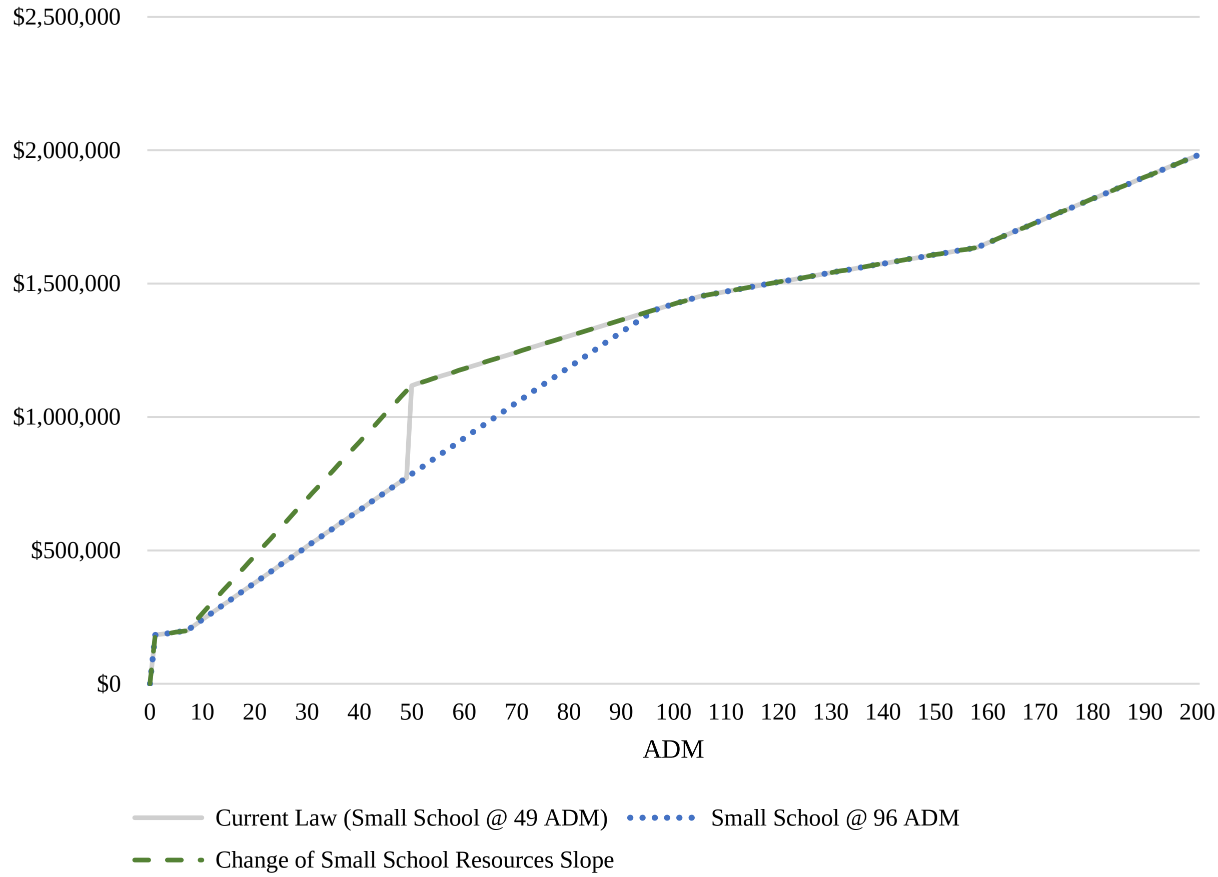


Source: Analysis of school year 2018-19 Funding Model Scenarios.

High Schools

The analysis at the high school level is similar to that of the middle school, except that the revenue change between 49 and 50 ADM is substantially larger – over $345,000 due to the minimum of 10 teachers resourced. Figure 3 displays two options for mitigating this revenue disparity. The solid gray line shows current law and the revenue change between 49 and 50 ADM. The orange dashed line shows the impact of changing the ADM to teacher ratio similarly to the approach in the middle school discussion above. As with the middle schools, this approach would eliminate the revenue change at 49 ADM. The blue dotted line shows what happens if the small school cut-off is shifted to 96 ADM, when the Funding Model would become effective lowering the slope of the funding line until 162 ADM. The large funding change between 49 and 50 ADM is eliminated under each option.

Figure 3. High School Scenario: Total School Level Resources



Source: Analysis of school year 2018-19 Funding Model Scenarios.

Hypothetical K-12 School

The solution for reducing large revenue changes appears relatively straightforward for elementary, middle and high schools – although the Funding Model would be further complicated by having different small school cut-off points based on the type of school or different small school funding for the type of school from 1 to 49 ADM.

The problem is complicated with multi-grade band schools. There is no straightforward solution that will eliminate unexpected revenue increases or declines with changes of one ADM for schools with multiple grade bands. There are several other factors that further complicate creation of a "smooth" line for schools with combined grade bands.

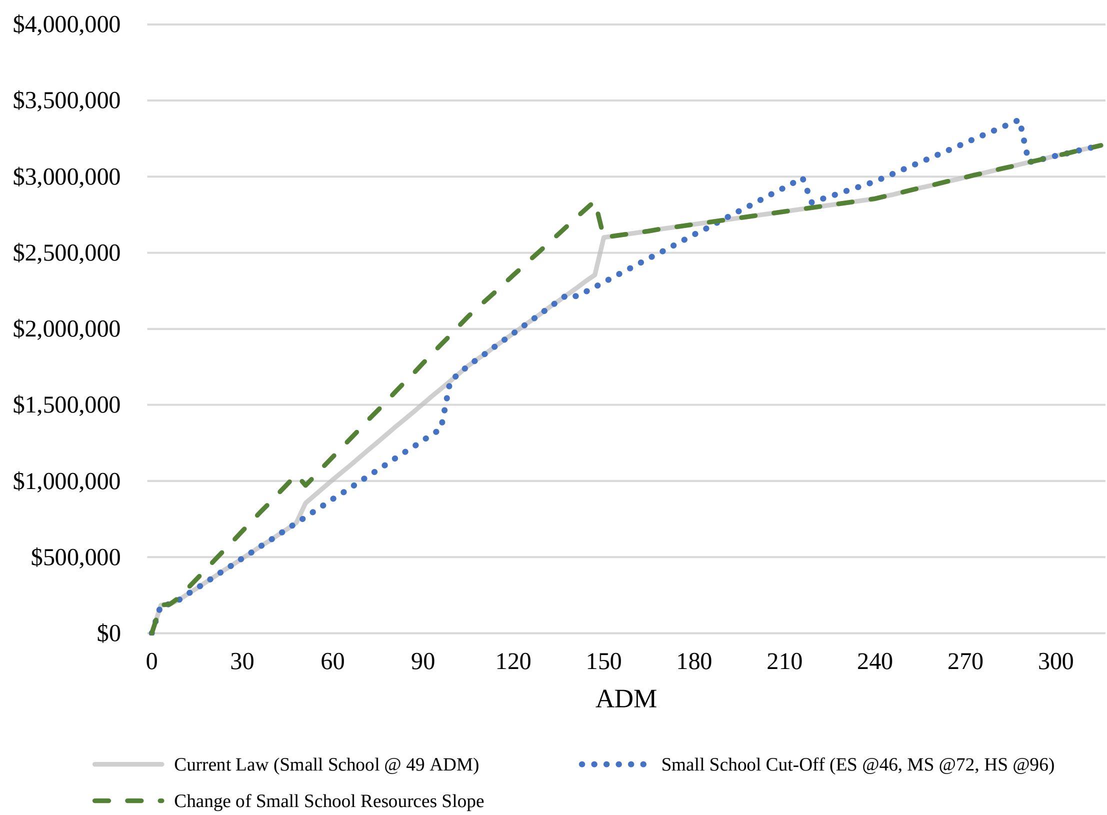
1. The number of students by grade level may differ from the hypothetical scenario presented below in Figure 4

2. The grades represented in the school will vary from the example changing the interaction of the 1:7 ratio and the minimum number of teacher requirements by grade band

3. The demographics of the students at each school will change actual revenue variances throughout the span of ADM.

To demonstrate these complications, Figure 4 displays the revenues that a hypothetical K-12 school would generate, when ADM is evenly distributed across the elementary, middle and high school grade bands. The shifts in total revenue show a number of kinks and adjustments regardless of which option is considered. Figure 4 displays the impact of current law in the solid gray line, and is in many ways, the most straightforward of the options presented. The orange dashed line displays the impact of cut-offs of 49, 56 and 70 ADM for elementary, middle and high schools, respectively. The solid gray line shows the impact of cut off points of 46, 72 and 96 ADM. It is important to note that even these lines will look different if the number of students in each grade band differs – a likely occurrence. In other words, regardless of the option selected, each school's revenue line would be different not only from other schools, but likely from year to year as the number of students by grade band and their demographics changed.

Figure 4. K-12 School Scenario: Total School Level Resources



Source: Analysis of school year 2018-19 Funding Model Scenarios.

IMPLICATIONS FOR ALTERNATIVE SCHOOLS

Any changes in the Funding Model for small schools has the potential to adversely impact the comparison of funding for alternative schools with the funding for small schools. Under the current Funding Model, alternative schools receive personnel funding based on the costs of staffing for 1 assistant principal plus 1 teacher for every 7 ADM. If the funding alternatives represented by the orange dashed lines in Figures 2 and 3 were implemented, up to 49 students an alternative school would be better off funding as a small school, but beyond 49 ADM it would be better off as an alternative school. If the approach represented by the blue dotted lines in Figures 2 and 3 were used, this effect would occur at 72 ADM for any alternative middle schools and 96 for alternative high schools. A multi-band alternative school would be impacted even differently depending the grade level of the students enrolled, with the potential that middle grade level students would generate resources via the teacher to ADM ratio at a different level than students in high school grades. Yet there is no research evidence to suggest that such differences have a foundation in educational practice. To be clear, if a change in small school funding is made, consideration of how alternative schools are funded may also need to be considered.

RECOMMENDATIONS

The analysis above shows that elimination of the revenue shifts that take place between 49 and 50 ADM is complicated and requires a number of potentially complex changes to the Funding Model. Moreover because of the dynamic relationships between a school's total ADM, student demographics, the small school funding ratio, the impact of grade band minimum teacher requirements, the wide variation in actual grade spans in individual schools (and enrollment in each grade), and the operation of the hold harmless function passed by the last session of the legislature (which guarantees districts with fewer than 243 ADM 97.5% of its previous year's revenue), the impact of any Funding Model change is both unpredictable and likely to be different from year-to-year and district-to-district.

In the final analysis, the important outcome is to ensure adequate funding for all schools. A substantial component of adequacy is continuity of programs and thus revenue. The examples outlined above show that at one point in the enrollment continuum, there are considerable losses of revenue due to a change of one ADM. The dynamic interactions of the Funding Model's minimum teacher allocations and resources for struggling students make exact prediction of the revenue impact on any school in any year largely impossible – thus confounding the ability to develop a formula that equitably addresses all possible situations.

Therefore, it is recommended that the Funding Model not be changed at this time, and instead, when large revenue decreases occur due to an enrollment change of one ADM from 50 to 49 ADM in either a middle school or high school or a middle school or high school grade band, the state mitigate that decline by spreading the reduction over a period of five years. This would effectively be a short-term loan, computed outside of the formula, with the revenue deductions taken out of total revenues regardless of the district's funding in following years. An example follows.

If a high school's ADM dropped from 50 to 49 in one year, rather than reduce the district's revenue by $345,000 (as shown above), the state would make an "off-model" payment to the district equal to 80% of that total reduction in that year. In the following four years, the district would repay the state in equal installments. This would enable program continuity for schools and districts, and at the same time recognize the revenue decline that occurred but spread it over time. Some judgment would have to be exerted by the state if the reduction occurs in small school districts because the hold harmless provision would provide a buffer to the amount of reduction in this example.

In the situation where a school's enrollment declined by more than one ADM, from 50 to say 47 ADM in one year, the revenue decline would be computed in two parts, the decline from 50 to 49 ADM ($345,000 in the example above), and the much smaller loss of revenue for the decline from 49 to 47 ADM. As envisioned in this recommendation, only the $345,000 would be subject to the multi-year "soft landing."

It is our suggestion that these revenue adjustments be computed "off model" and that the adjustments be monitored by the Wyoming Department of Education and Legislative Service Office on an annual basis. If a district's enrolment fluctuated between 50 and 49 ADM over a period of years, each revenue decline would be treated separately for the purpose of the five year "soft landing."

The goal of this recommendation is to initially maintain continuity of funding and thus educational services, but at the same time ensure districts receive the revenue to which they are entitled through the Funding Model. In this case, the state effectively loans the district money to mitigate a dramatic funding loss. At the same time, this option does not require complex modifications of the Funding Model to accommodate potentially rare and highly variable situations.

7. Instructional Facilitators/Coaches

Instructional coaches, or instructional facilitators (IF), coordinate the instructional program but most importantly provide the critical ongoing instructional coaching and mentoring the professional development literature shows is necessary for teachers to improve their instructional practice (Cornett & Knight, 2008; Crow, 2011; Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Calhoun, 1996; Joyce & Showers, 2002). This means instructional facilitators spend the bulk of their time with teachers, modeling lessons, giving feedback to teachers, working with teacher collaborative teams, and generally helping to improve the instructional program.

Some instructional coaches may also function as school technology coordinators. In that role they provide the technological expertise to: fix small problems with personal computer systems, install software, connect computer equipment so it can be used for both instructional and management purposes, and provide professional development to embed computer technologies into a school's curriculum.

From 2020 onward, Wyoming IFs will need to work with teachers to develop the content and pedagogical skills to address computational learning and algorithmic thinking at all grade levels, but especially at elementary grade levels. They will also need help to teach computer science as an elective course in middle and high schools. Since IFs should have been in the Wyoming system for years, and should have addressed all core subjects, these additional content emphases should be readily addressable by IF resources. This report expands on the rationale for instructional coaches in the section on professional development (Element 16), but includes them here as they represent teacher positions.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
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 instructional facilitator position for each school district. Fund as a categorical grant.	Provide 0.45 instructional facilitator/coaches for prototypical elementary (288 ADM) and secondary (315 ADM) schools at the highest-grade band level. Funding rolled into the Block Grant.	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 instructional facilitator position for each school district. Fund as a categorical grant.	321 more FTEs $27.2 million (75%) $31.3 Million (85%)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

A few states (i.e., Arkansas, New Jersey, Wyoming and to a modest degree North Dakota) explicitly provide resources for school-based instructional coaches. Most comprehensive school designs (see Odden, 1997; Stringfield, Ross & Smith, 1996), and EB studies conducted in other states – Arizona, Arkansas, Illinois, Kentucky, Maine, Maryland, Michigan, North Dakota, Vermont, Washington and Wisconsin – call for school-based instructional facilitators or instructional coaches (sometimes called *mentors*, *site coaches*, *curriculum specialists*, or *lead teachers*). Further, several comprehensive school designs suggest that while one instructional facilitator might be sufficient for the first year of implementation of a schoolwide comprehensive improvement program, in subsequent years an additional 0.5 to 1.0 FTE facilitator is needed. Moreover, new technology designs recommend a full-time facilitator who spends at least half-time as the site's technology expert (for example, see Stringfield, Ross, & Smith, 1996). Drawing from this research, the EB model provides one instructional facilitator/coach position for every 200 students. This general recommendation has been adapted for clarity in Wyoming to require 1.5 instructional coaches for a prototypical 288-student elementary school and 1.5 instructional coaches for a prototypical 315-student middle and high school.

Early research found strong effect sizes (1.25-2.71) for instructional coaches as part of professional development (Joyce & Calhoun, 1996; Joyce & Showers, 2002). Several years later, Sailors and Price (2010) found that professional development combined with coaching increased the deployment of comprehensive instructional practices by between 0.64 and 0.78 standard deviations. Newmann and Cunningham (2009) found a similar impact on teachers' instructional impact as well as improved reading achievement by about 0.2 standard deviations. A 2010 evaluation of a Florida program that provided reading coaches for middle schools found that teachers who had the benefit of a coach implemented more instructional methods that are linked to improved student performance in reading (Lockwood, McCombs & Marsh, 2010). A related study found that coaches provided as part of a data-based decision-making initiative also improved both teachers' instructional practice and student achievement (Marsh, McCombs & Martorell, 2010). A study published two years later reached the same conclusions about coaching as part of a program to improve reading (Coburn & Woulfin, (2012).

Positive impacts of coaching are not limited to reading instruction and achievement, however. Campbell and Malkus (2011) found that the combination of professional development and two years of coaching changed teachers' instructional practice and increased students' mathematics achievement by about 0.2 standard deviations. Importantly, a randomized controlled trial of coaching (Pianta, Allen & King, 2011) found significant, positive impacts in the form of student achievement gains across all four core subject areas – mathematics, science, history, and language arts. Finally, a 2018 meta-analysis of 60 studies of the causal effects of instructional coaches, found the impact of instructional coaching on instruction was 0.49 SD and 0.18 on student achievement, with the largest number of studies on coaching programs for PreK-5 elementary reading programs (Kraft, Blazar & Hogan, 2018). Moreover, the bulk of the 60 studies were conducted within the past 10-15 years, many with experimental designs that allowed for causal implications. Kraft, Blazar & Hogan also describe various kinds of instructional coaching and discuss how coaching fits into the core elements of overall professional development.

These research findings provide rigorous support for this element as an effective strategy to boost student learning. Moreover, educators across the country have relied on this research to hire increasing numbers of instructional coaches as part of more rigorous school improvement strategies. Domina et al. (2015) found that the number of instructional specialists per 1,000 students doubled from 1998 to 2013 (from about 0.7 to 1.4) and that the percent of districts with no such staff declined from 20% to 7%. In addition, Cobb and Jackson (2011) argue that instructional coaches are key to improving instructional practice at scale, particularly in mathematics.

Although instructional coaching positions are identified as full-time positions, schools could divide the responsibilities across several individual teachers. For example, the 3.0 positions in a 630-student high school could be structured with six individuals who were half-time teachers and half-time instructional coaches. In this example, each teacher/coach would work 50% time as a coach – perhaps in one curriculum area such as reading, math, science, social studies and technology – and 50% time as a classroom teacher or tutor.

Instructional coaches are a critical part of successful professional development for teachers. With the shift to college and career ready standards requiring substantial change in teachers' instructional practice, we recommend that the Legislature adopt the EB recommendation for instructional facilitators and that school districts hire and use the full coterie of instructional coaches and consider hiring even more coaches with their federal funds. If schools are to boost the achievement curve and address the new emphasis on algorithmic and computational thinking as well as computer science, teachers' instructional practice must become more effective as well as broadened to include these elements, all of which can be aided by using more instructional coaches as recommended in the EB Model.

We recommend that the Legislature return funding for instructional facilitators to a categorical program, removing the funding from the Block Grant, AND that they increase funding for instructional facilitators to the full 100 percent as outlined in the EB Model. For over a decade and a half, not only in Wyoming but in other states as well, we have recommended funding IFs in categorical grant programs. States that did not establish categorical programs for IFs found that many fewer IFs were actually hired than allotted by the funding formula. In Wyoming, until the recent decision to place IF funding in the block grant, the actual number of IFs employed by districts was substantially the same as the number allotted by the funding Model. We anticipate that by rolling the resources for IFs into the Block Grant, Wyoming school districts will hire fewer IFs in the future.

We note that the level of staffing for instructional coaches recommended in the EB Model, combined with the additional elements of professional development discussed below, is the best way to focus on making Tier 1 instruction (in the RTI framework) as effective as possible, providing a solid foundation of high quality instruction for everyone, including students who struggle more to learn to proficiency. Support for IFs as part of the EB model is bolstered by the study of special education programs and services that are part of the 2020 recalibration (District Management Group, 2020) that recommends that IFs be fully funded as a key element of making the general reading program as effective as possible.

Resource Use Analysis

In 2013-14 the Legislative Model allocated a total of 266.5 instructional coach positions to Wyoming school districts. The districts employed 242.1 instructional coaches or 24.4 fewer than allocated. In 2014-15 the Legislative Model allocated a total of 270.2 instructional and districts hired 249.7 individuals, 20.6 fewer than the model allocated. Funding for instructional coaches (IFs) began to drop when the IF positions were rolled into the Block Grant. As a result, in 2017-18 the Model provided for 247.2 IFs but districts hired only 154.3, and for the 2018-19 school year the Model reduced the number of IFs resourced to135.4 with districts hiring 142.9.[5] If the state considers IFs a key ingredient for school improvement, it would be wise to put the funds back into a categorical program and fully fund the program identified in the EB Model.

PJ Panel Comments on Instructional Facilitators/Coaches

There was broad support for IFs throughout all of the PJ panels. Most panelists felt that coaches added value to the schools where they were employed, and many bemoaned the loss of IFs and their funding, and felt that moving the IF funding into the block grant would result in even fewer IFs. Comments like “IFs are critical and should be funded,” and “We need to capitalize on the strengths of IFs to improve instruction” were common. There was support for the 1.5 IF positions in prototypical elementary and secondary schools.

When discussing the reduced funding for IFs, PJ panelists noted that rural schools have more trouble funding the IF positions now and that it is hard for IFs to work in multiple schools where they have to spend many hours driving between schools each week. There was notable concern that schools will lose more IFs over time unless funding is restored, and many added that the funding should go back to be a categorical program.

Panelists indicated that IFs worked with teachers and with PLC to help understand assessment results that the role of an IF was “not fluff.” One PJ panelist noted that with the latest round of funding reductions for IFs, there was only one IF for all seven schools in her district.

A number of panelists argued that IFs were only effective if they did the job well or correctly and were concerned that many did not receive adequate training. Some felt that their district used the IF position to replace ineffective teachers – which they argued was not the purpose of the IF position. There was concern that some IFs spent too much time “pulling data” and not enough working with teachers on improving instruction. Another issue was that in some places IFs were expected to do too much administrative work, keeping them from the assigned role as an instructional coach. Some were also concerned that IFs played an evaluative role in assessing teacher performance, Finally, some felt more training was needed for IFs.

In sum, there was generally strong support for IFs, and a call for fully funding the positions as called for in the EB model. PJ panelists mostly supported returning the IF positions to a

[5] Source for IF data is CRERW Table sfp_crerw_staffing_table4

categorical model, although a few felt it would be OK if they were fully funded within the block grant.

2020 Evidence-Based recommendation

Provide funding for instructional facilitators at the rate of 1.5 positions for each prototypical elementary, middle and high school (315 ADM), resourced at the highest-grade band level, with a minimum of one instructional facilitator for each school district. Fund as a categorical grant program outside of the block grant.

8. Core Tutors/Tier 2 Intervention

The most powerful and effective approach for helping students struggling to meet state standards is individual one-to-one or small group (1:3 or 1:5 maximum) tutoring provided by licensed teachers (Cook, et al., 2015; Elbaum, Vaughn, Hughes & Moody, 2000; Freyer, 2016; Nickow, Oreopoulos, & Quan, 2020; Shanahan, 1998; Wasik & Slavin, 1993). In our 2005 and 2010 recalibration reports we recommended allocating tutors to schools solely on the basis of the number of at-risk students, with a minimum of one tutor position for each prototypical sized school. Since then and especially with more rigorous curriculum and student performance standards, we have recognized that all schools, even those with no at-risk students (as measured by ELL, free and reduced lunch eligibility and mobility) have struggling students that need Tier 2 resources. Thus, we augmented the 2015 EB Model to resource each prototypical school with one *core* tutor position based on school ADM **and** additional *at-risk* tutors based on the at-risk count (Element 26).

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
Provide 1.0 core tutor position for each prototypical 288-ADM elementary school and for every 315 middle or high school ADM, resourced at the highest grade-band level.	If the provision of at-risk tutors (element 26) is less than 1.0, additional tutor resources are provided so that a prototypical school receives a minimum of 1.0 tutor. This minimum is prorated down as school ADM decreases.	Provide 1.0 core tutor position for each prototypical 288-ADM elementary school and for every 315 middle or high school ADM, resourced at the highest grade-band level.	215 FTEs $18.6 million (75%) $23.8 million (85%) *Note: Net increase in total tutors includes both Core (Element 8) and At-Risk tutors (Element 26). EB Model Generates 302.6 core tutors and 287.6 at risk tutors*

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

The most powerful and effective extra help strategy to enable struggling students to meet state college and career ready standards is individual one-to-one or small group (1:3 or 1:5 maximum) tutoring provided by licensed teachers (Elbaum, Vaughn, Hughes & Moody, 2000; Shanahan, 1998; Wasik & Slavin, 1993). Students who must work harder and need more assistance to achieve to proficiency levels especially benefit from preventative tutoring (Cohen, Kulik, & Kulik, 1982). Tutoring program effect sizes vary by the components of the approach used, e.g., the nature and structure of the tutoring program, but effect sizes on student learning reported in meta-analyses range from 0.4 to 2.5 (Cohen, Kulik & Kulik, 1982; Nickow, Oreopoulos, & Quan, 2020; Shanahan, 1998; Shanahan & Barr, 1995; Wasik & Slavin, 1993) with an average of about 0.75 (Wasik & Slavin, 1993). A 2016 meta-analysis of the impact of intelligent, or computer-based, tutoring found that the average effect size was 0.66 across multiple subjects, which increases student performance from the 50^{th} to the 75^{th} percentile (Kulik & Fletcher, 2016), though the effect varied by type of tutoring. A 2017 meta-analysis of the impact of tutoring found similarly high effects (Dietrichson, Bog, Filges, & Jorgensen, 2017). A July 2020 meta-analysis of tutoring effects also concluded that tutoring had impressive effects on student learning (Nickow, Oreopoulos, & Quan, 2020).

The impact of tutoring programs depends on how they are staffed and organized, their relation to the core program, and tutoring intensity. Researchers (Cohen, Kulik, & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) have found greater effects when the tutoring includes the following:

- Professional teachers as tutors
- Tutoring initially provided to students on a one-to-one basis
- Tutors trained in specific tutoring strategies
- Tutoring tightly aligned to the regular curriculum and to the specific learning challenges with appropriate content specific scaffolding and modeling;
- Sufficient time for the tutoring, and
- Highly structured programming, both substantively and organizationally.

We note several specific structural features of effective one-to-one tutoring programs:

1. Each tutor works with one student every 20 minutes, or three students per hour. This allows one tutor position to serve 18 students a day. (Since tutoring is such an intensive activity, individual teachers might spend only half of their time tutoring; but a 1.0 FTE tutoring position would allow 18 students per day to receive 1:1 tutoring.). Four positions would allow 72 students to receive individual tutoring daily.
2. Most students do not require tutoring all year long; tutoring programs generally assess students quarterly and change tutoring arrangements. With modest changes, close to half the student body of a 400-student, all at-risk school could receive individual tutoring during the year.
3. Although low-income background is a general indicator of the possible need for tutoring, any student that is struggling to reach standards, regardless of background, should be

> provided tutoring. This is the main rationale for providing one tutor for each prototypical school, regardless of the number of at-risk students.

Though this discussion focuses on *individual* tutoring, schools can also deploy these resources for small group tutoring. In a detailed review of the evidence on how to structure a variety of early intervention supports to prevent reading failure, Torgeson (2004) shows how one-to-one tutoring, one-to-three tutoring, and one-to-five small group sessions (all Tier 2 interventions) can be combined for different students to enhance their chances of learning to read successfully.

One-to-one tutoring would be reserved for the students with the most severe reading difficulties, scoring at or below the 20^{th} or 25^{th} percentile on a norm referenced test, or at the below basic level on state assessments. Intensive instruction for groups of three-to-five students would then be provided for students above those levels but below the proficiency level.

It is important to note that the instruction for all student groups needing extra help, particularly in reading, needs to be more explicit and sequenced than that for other students (Honig, 1996). Young children with weakness in knowledge of letters, letter sound relationships and phonemic awareness need explicit and systematic instruction to help them first decode and then learn to read and comprehend. As Torgeson (2004:12) states:

> Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own. For example, explicit instruction requires teachers to directly make connections between letters in print and the sounds of words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group of high at-risk children in kindergarten, first grade and second grade …..only the most [phonemically] explicit intervention produced a reliable increase in the growth of word-reading ability … schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire work-reading skills at grade level by the third grade …. Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text…. Finally, it requires not only direct practice to build fluency…. but also, careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning.

These issues about the nature of the reading program are addressed at more length in the section on instructional materials, Element 17.

Torgeson (2004) also references meta-analyses that consistently show the positive effects of reducing reading group size (Elbaum, Vaughn, Hughes & Moody, 1999) and identifies experiments with both one-to-three and one-to-five teacher-student groupings. Though one-to-one tutoring works with 20 minutes of tutoring per student, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes. The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, one reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group, and 30+ students a day in the one-to-five setting with 45 minutes of instruction per group. Four tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though we have emphasized one to one tutoring, and some students need one to one tutoring, other small group practices (which characterize the bulk of Tier 2 interventions) can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) stated similar interventions can work with middle and high school students, he found that the effect, unfortunately, was smaller as it was much more difficult to undo the lasting damage of not learning to read when students enter middle and high schools with severe reading deficiencies. Nevertheless, Torgeson is also viewed as a key individual who encourages practitioners and policymakers to address reading interventions for secondary students because, until the 1980s most reading research and interventions were developed for grades K-3. Since then, several effective secondary reading interventions have been developed (Scammacca, Roberts, Vaughn & Stuebing, 2015) and should be considered by schools as the resources to deploy them are included in the EB funding model. Further, a 2014 randomized control study, (Cook et al., 2014), found similarly positive impacts of a tutoring program for adolescents in high poverty schools if it was combined with counseling as well. This dual approach is made possible in the EB Model as it includes the additional non-academic pupil support resources (see Element 27 discussion).

The rationale outlined above is strengthened by two randomized controlled trials of the effectiveness of tutoring for struggling students, which support our logic for providing a minimum level of tutor support in all schools as well as additional tutors for schools with greater need. Using a randomized controlled trial, May et al., (2013), assessed the impact of tutors in an elementary focused Reading Recovery program. Reading Recovery is a short-term intervention that provides one-on-one tutoring to first-grade students who are struggling in reading. The supplementary program aims to promote literacy skills and foster the development of reading strategies by tailoring individualized lessons to each student. As part of the scale-up, the 3,747 teachers trained in Reading Recovery provided one-to-one Reading Recovery lessons to 62,000 students and taught an additional 325,000 students in other instructional settings.

The evaluation included a four-year, multi-site randomized control trial (RCT) involving nearly 7,000 first-grade students in more than 1,200 schools. Students who participated in Reading Recovery significantly outperformed students in the control group on measures of overall reading, reading comprehension, and decoding. These effects were similarly large for English language learners and students attending rural schools, which were the student subgroups of priority interest for the i3 scale-up grant program. The RCT revealed medium to large impacts across all outcome measures. Effect sizes on the Iowa Test of Basic Skills (ITBS) Reading Total assessment and its Comprehension and Reading Words subscales at the end of 12 to 20 weeks of treatment ranged from 0.30 and 0.48 standard deviations. For the ITBS Total Reading battery, this effect size translates to a gain of +18 percentage points in the treatment group, as compared with control students. The growth rate observed in students who participated in Reading Recovery over approximately a five-month period was 131% of the national average rate of progress for first-grade students.

For students in high schools, Cook, et al. (2014) reported on a randomized controlled trial of a two-pronged intervention that provided disadvantaged youth with tutoring and counseling. They found intensive individualized academic extra help – tutoring – combined with non-academic supports seeking to teach grade 9 and 10 youth social-cognitive skills based on the principles of cognitive behavioral therapy, led to improved math and reading performance. The study sample consisted mainly of students from low income and minority backgrounds, which generally pose the toughest challenges. The effect size for math was 0.65 and for reading was 0.48. The combined program also appeared to increase high school graduation by 14 percentage points (a 40% hike). The authors concluded this intervention seemed to yield larger gains in adolescent outcomes per dollar spent than many other intervention strategies. A quasi-experimental study of a combined tutoring and counseling program for Black youth in another state produced similar results on effectiveness (Somers, et al., 2016).

These studies are highlighted for several reasons. First, they represent new, randomized controlled trials, supporting the efficacy of tutoring. Second, they show tutoring can work not only for elementary but also for high school students, whereas most of the tutoring research addresses elementary-aged students. Third, they show tutoring can work even in the most challenging educational environments. Lastly, they bolster the EB Model recommendation below that extra help resources in schools triggered by poverty/at-risk status should include some non-academic, counseling resources as well, as the treatment in the second study was tutoring combined with counseling.

Recent research (Barshay, 2020) on the importance of tutoring offers new recommendations for providing tutoring to struggling students, especially for the learning loss resulting from COVID-19. Brown University Professor Matthew Kraft and Johns Hopkins University Professor Bob Slavin recommend a national effort focused on of what they term “high dosage tutoring” (HDT). HDT uses one person to tutor one or two students at a time for a full period a day five days a week. This is substantially more than the traditional 20-30 minutes of tutoring often recommended in other research. Rather than a teacher, HDT is usually provided by a recent college graduate who has been trained in a specific math or reading tutoring program linked to the school’s curriculum. The tutors are not volunteers, nor traditional paraprofessionals, but full-time school employees who have earned a bachelor’s degree in a content area and are typically paid at a rate between an instructional aide and a new teacher. Research suggests this HDT approach has larger effect sizes than found in the studies of more traditional tutoring programs described above (see Baye et al., 2019; Cook et al., 2015; Freyer, 2016). Kraft and Slavin propose a corps of HDT tutors as one strategy for making up for the loss of learning caused by COVID-19, particularly for students from low income backgrounds. HDT tutors hopefully could also boost achievement by significant amounts for any group of students achieving below expectations and is a strategy Wyoming should seriously consider.

In the 2000s, the EB Model included a minimum of one tutor position for each prototypical school. The recommendation was a minimum of one tutor position for each prototypical school with that number subtracted from the tutor positions based on at-risk counts that was one tutor position for every 100 at-risk students. As a result, a school without any at-risk students would receive the minimum of one tutor position based upon the school's ADM, but a school with 100 at-risk students would receive the same single tutor, even though it might have more need for tutor resources.

With the advent of college and career ready standards and more rigorous curriculum programs, educators argued that more students would need extra help. In 2015 we increased the tutor resources in the EB Model to provide one *core* tutor/Tier 2 intervention position for each prototypical school. In parallel to that change, the 2015 EB Model adjusted the ratio for additional at-risk tutor positions from one tutor position for every 100 at-risk students to one position for every 125 at-risk students. The additional support beyond the first tutor per prototypical school is discussed again in Element 26 below. The 2020 EB Model recommendation for *core* tutor/Tier 2 intervention positions is the same as the 2015 EB recommendation.

Resource Use Analysis

Wyoming school districts do not employ tutors in nearly the numbers generated through the Legislative Model. In SY 2013-14, the Legislative Model generated 380.1 tutor positions, while districts employed 131.0 tutors or 249.1 fewer than funded.[6] In 2015-16, the Legislative Model generated 385.6 tutors and districts employed just 170.1, for a difference of 215.5. Likewise, in 2017-18, the Legislative Model generated 390.4 tutors and districts employed just 163.8, for a difference of 226.6. And in 2018-19, districts hired only 160.5 tutors compared to funding for 388.1, a difference of 227.6.[7]

The count of tutors as well as all non-teacher staff (e.g., counselors, tutors, etc.) is confounded somewhat by the fact that districts also report a position called "teachers not of record" to the WDE and some districts may be reporting some tutors in that category. In 2013-14, a total of 73.2 teachers are reported in this category; that figure rose to 95.7 by 2018-19. Even if one assumes all these teachers not of record were employed as tutors (an unlikely occurrence), the Legislative Model would still generate 132 more tutors statewide than are employed.

This analysis demonstrates school district practices with respect to tutors are not aligned with the Funding Model. Since extra help for struggling students is critical to educating all students to proficient or higher performance levels, the resources for tutors to provide this extra help should be fully utilized. During the 2020 recalibration, the Legislature should consider incentives for districts to provide struggling students extra help or consider putting the tutoring resources into a categorical program. Holding performance standards constant and varying instructional time is a key strategy for ensuring all students are able to meet higher standards.

PJ Panel Comments on Core (and At-Risk) Tutors

[6] CRERW Table sfp_crerw_appendix_d
[7] CRERW Table sfp_crerw_staffing_table5

Note that because the Legislative Model allocates most of the tutors to districts through the at-risk tutor computation, and the EB model allocates substantially more tutors, many more through the minimum number of tutors than the Legislative Model, the comments from PJ panelists were often combined between core tutors and at-risk tutors. Comments here reflect panelists views regarding tutors generally.

Overall, there was strong support for tutors, and panelists felt there should be more tutors. In many instances, schools and districts provide tutoring services with Title I funds, which because those positions are supported by federal government funds are not included in the EB or Legislative Models nor within the analysis in the CREWR. Laramie County #1 representatives indicated that tutors were funded with Title I only, while in Natrona, panelists indicated that each school receives one tutor with state/local resources and many schools have additional tutors funded with Title 1.

Some districts simply did not have tutors or spread them across multiple schools and then expressed concerns about “windshield” time rather than time spent with students. A few districts indicated that tutor positions were used to help ESL students because the ELL funding component of the model was insufficient for their programs.

Several panelists said that they use instructional aides for tutors as they are more cost effective in their view, although none of those individuals were aware of whether or not the aides were highly trained as the evidence above suggests is necessary for success.

Overall, PJ panelists confirmed that there are likely many fewer tutors in schools than are funded by the model, and universally argued that more tutors were needed.

2020 Evidence-Based recommendation

Provide 1.0 core tutor position for each prototypical school (288 ADM elementary school and 315 ADM middle or high school), resourced at the highest grade-band level. Note that unlike the Legislative Model, the core tutor positions in the EB Model do NOT reduce the tutor positions generated on the basis of at-risk ADM counts.

9. Substitute Teachers

Schools need support for substitute teachers to cover classrooms when teachers are sick for short periods of time, absent for other reasons, or on long-term leave. In other states, substitute funds are budgeted at a rate of about 10 days per teacher. The 2020 EB Model recommendation provides the same.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
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 $103 plus 7.65% for social security and Medicare benefits ($110.85). Daily salary adjusted by regional cost adjustment.	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.	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 $120 plus 7.65% for social security and Medicare benefits ($129.18). Daily salary adjusted by regional cost adjustment.	$2.4 million *Note: Since this component is variable based on the number of teachers, tutors, IFs, summer school and extended-day teachers, the estimated FTE staff difference will fluctuate if any of those components are changed.*

*The source for all cost differences reported in this chapter is a simulation model developed specifically for the 2020 recalibration process.

Analysis and Evidence

During previous recalibrations we recommended 10 days of substitute teacher resources for each teacher, and assuming a teacher work year of 200 days, the substitute allocation was 5% of teacher annual workdays. This approach did not mean each teacher was provided 10 substitute days a year; it meant the district would receive a "pot" of money approximately equal to 10 substitute days per year for all teachers, in order to cover classrooms when teachers were absent for reasons other than professional development. Professional development recommendations and resources are fully developed in a separate section below (Element 13).

In the WY block grant model, all teachers include: all core and elective teachers, tutors, ELL teachers, instructional facilitators or coaches, and teachers for extended day and summer school programs as resources for all schools. The Legislative Model provides substitute positions for all teachers as defined above, but at 5 percent of instructional days. The substitute positions are then multiplied by the number of instructional days, which for the Legislative Model is 175 days, and then multiplied by the daily compensation amount used in the model. This results in 8.75 substitute days allocated to a district for each teacher as defined above. The EB model seeks to generate 10 days of substitute time per teacher thus requiring a rate of 5.715 percent of the instructional days to generate the 10 days of substitute time per teacher.

School district substitute expenditures reported to the WDE cannot disaggregate the reasons for the use of each substitute teacher. In the past, several school districts claimed their substitute teacher expenditures exceeded the revenues provided by the Legislative Model. Our PJ panel discussions suggested that one reason substitute expenditures exceeded the Legislative Model allocation was that substitute teacher expenses to support student activities (i.e., to allow coaches to attend athletic events) were accounted for as substitute teacher expenditures in the instructional budget instead of charged to the student activities budget. We provide recommendations for allocation of the costs of substitutes for student activities in the section devoted to student activities (Element 21).

There are three issues to address in assessing substitute teacher resources: the number of days provided for substitute teachers, the compensation amount and whether to apply the RCA to the daily substitute rate.

Number of Days of Substitute Time

Many states provide substitute teacher resources for about 10 days for each teacher, which is similar to many companies and governments that provide one sick day per month for employees. Since teachers work about ten months, the number of sick days is reduced from 12 to 10. The EB Model assumes the average teacher work year is 200 days: 180 days of instruction, 10 days of professional development, and 10 days for opening and closing schools and parent conferences.

The Legislative Model provides substitute pay for only 8.75 days, which represents five percent of 175 instructional days rather than the number of days in teacher contracts that range from 180 to 190 days. To reach the EB Model suggested rate of 10 substitute days for each teacher, we recommend the Legislative Model be recalibrated to provide 5.715 percent of teacher days rather than the current five percent. This assumes a total of 175 workdays rather than the EB model's 200-day work year for teachers. An easier way to achieve the same goal is to provide 10 substitute days for each teacher position.

Substitute Daily Compensation Rate

During the 2015 recalibration, we collected via a survey, the daily substitute rate from all districts over a nine-year time period. The data showed that in any one year several districts had substitute rates lower than what the Legislative Model provided, while several other districts had rates that were higher, though the differences were not dramatic. There did not appear to be any systematic pattern for substitute rates higher or lower than the Legislative Model. The goal of the substitute teacher element is to provide enough resources that districts can tap to pay substitute teachers.

Application of the RCA to Substitute Rates

Another issue is whether to apply the RCA to the daily substitute pay rate. We believe this concept has merit because it is a salary item subject to regional differences like all other salaries in the Legislative Model. As we did in 2015, we recommend that the daily substitute teacher rate should be adjusted by the RCA for each school district.

Resource Use Analysis

When converted to teacher position equivalents, the 2020 EB model allocates 418 FTE teaching positions for substitutes, whereas the Legislative model allocates 377 FTE teacher equivalents for substitute teachers.

PJ Panel Comments on Substitutes

Overall districts felt that the 10 days of substitute time were adequate, but the problem was finding enough substitutes to meet district needs. They all felt very strongly that existing teachers and other certificated staff in a school should not be used as substitutes as that degraded their other teaching or their job performance in other areas. There were several challenges to finding substitutes:

Pay

Many PJ panelists indicated their district paid more than the Legislative Model's base rate of $102 (plus social security and Medicare). The daily amounts paid for substitutes ranged from $120 to $140 or $150, and in some instances daily rates were as high as $175. One district reported paying $275 a day for certified teachers who worked as substitutes. There was strong agreement that the model needed to provide more per day for substitutes.

Supply of Substitute Teachers

Virtually all districts had trouble finding enough substitutes throughout the year. In some instances, there simply were not enough eligible substitute teachers. In others, competition from other sectors of the economy made it hard to find substitutes. For example, in Teton #1, during the ski season, wages in the tourist industry exceeded what the school district paid for substitutes. In Uinta, there appeared to be adequate numbers of substitutes at the start of the year, but many found other jobs over the course of the school year. At least one district expressed concern about raising substitute pay high enough to make being a substitute more attractive than working as a paraprofessional; under those circumstances, some districts had trouble keeping paras in place in schools.

The only district among the PJ participants that indicated they could find enough substitutes was Laramie #1 where the substitute pay was $16 to $20 above the model, and where there seemed to be a good supply of qualified individuals from the local Air Force Base.

Substitute Qualifications

Some of the more rural districts reported trouble finding substitutes who could teach the higher-level skills courses. PJ panelists reported that there was a competition for the substitutes who were qualified to teach higher level courses so that students did not fall behind.

Activities

Most activities that required travel took place on Friday. As a result, there was substantial demand for substitutes on Fridays when classroom teachers who also served as coaches traveled with the teams. In some of the smaller school districts, this has been one of the reasons the district shifted to a four-day school week. The district then did not have to identify substitutes and the problems associated with absenteeism due to participation in activities was reduced.

2020 Evidence-Based Recommendation

Provide for 10 days of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches and teacher positions for summer school and extended day. Resource substitute teachers at a daily rate equal to $120 a day plus 7.65 percent for social security and Medicare benefits. This total of $129.18 per day should be adjusted by the regional cost adjustment (RCA).

10. Core Counselors and Nurses

Based on PJ Panel feedback, the 2020 EB Model Recommendations for core counselors and nurses has two changes from the 2015 EB Model recommendation. Specifically, we add a recommendation for a minimum full-time counselor and minimum half-time nurse in each district. The overall recommendation for counselors and nurses includes the positions described here as well as additional pupil support positions (e.g., social workers, psychologists, family liaison persons, etc.) based on at-risk student counts as described in Element 27 in the section on struggling students.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
CORE COUNSELORS			
Provide 1.0 school counselor position for each prototypical elementary school (288 ADM) and 1.0 school counselor position for every 250 ADM in middle and high schools.	For elementary schools, if the provision of at-risk tutors (element 26) is less than 1.0, additional tutor resources are provided so that a prototypical school receives a minimum of 1.0 tutor. This minimum is prorated down as school ADM decreases. For middle and high schools, provide 1.0	Provide 1.0 school counselor position for each prototypical elementary school (288 ADM) and 1.0 school counselor position for every 250 ADM in middle and high schools. Provide a minimum of 1.0 counselor position for each district.	165 FTEs $14.1 million (75%) $17.2 million (85%) *Note: The minimum of 1.0 counselor per district increases the number of counselors by 2.97 FTE statewide.*

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
	counselor position for every 250 ADM		
NURSES			
Provide 1.0 school nurse position for every 750 ADM.	No nurses resourced directly, but districts can use minimum pupil support resources as nurse positions.	Provide 1.0 school nurse position for every 750 ADM. Provide a minimum of half a nurse position for each district .	125 FTEs $10.4 million (75%) $11.7 million (85%) *Note: The minimum of one-half nurse per district increases the number of nurses by 2.06 FTE nurses statewide.*

*The source for all cost differences reported in this chapter is a simulation model developed specifically for the 2020 recalibration process.

Analysis and Evidence

Schools need counselors and nurses especially given the changing social, health, emotional and mental conditions of children in America and Wyoming. Sparks (2019) reported that there were nearly 1.36 million homeless children attending schools in 2017, a rapid rise over previous decade. Keierleber (2019) estimated that in school year 2016-17 two percent of Wyoming's school children experienced homelessness. This figure may grow during the economic slowdown resulting from the COVID-19 pandemic. Homeless students need more academic as well as non-academic (counselor) help. In 2016-17 only 30 percent of children who experienced homelessness that year were proficient in reading and just 25 percent were proficient in math Keierleber (2019).

Many homeless children live independently, some live with other families, while others live in shelters and tents. Homelessness reflects not only a lack of housing and living in poverty, but also a life full of uncertainty and trauma of a variety of sorts. Homeless students graduate from high school at lower rates than students from low income households who are not homeless. Keierleber (2019) identified a graduation rate of 64 percent for homeless students compared to an average of 77.6 percent graduation rate among other low-income students and a national average of 84.1 percent for all students.

Beyond homelessness, Blad (2019) reported a rise in depression among American students, an increase in suicide efforts and a general uptick in variety of mental illnesses. To be sure, some of these maladies are a result of social media bullying, but the bulk is due to dis-functional families, poverty, lack of health services, homelessness, and recent immigration status that in many instances include traumatic experiences. Blad reports that there has been a significant increase in episodes of deep depression since 2005, with the incidence for school-aged children significantly above the general population.

Burstein, Agostino and Greenfield (2019) document the doubling of suicide attempts by American teenagers over the last decade. Using data from the National Hospital Ambulatory Medical Care Survey, administered annually by the US Centers for Disease Control and Prevention, the study found that the number of children and teens in the United States who visited emergency rooms for suicidal thoughts and suicide attempts doubled between 2007 and 2015. The findings came as no surprise to child psychiatrists, with most saying they knew that suicide and depression had been rising significantly. The findings sadly showed that for America's teens, emotional distress and propensity toward self-harm grew more than for any other age group of Americans over this time period. The findings hold for Wyoming. In 2019, the suicide rate for Wyoming young people aged 15-24 was one of the highest in the country at 36 per 100,000 population, more than twice the national rate of 15.[8]

Finally, the physical and medical needs of students also have changed dramatically in recent decades. Rising numbers of students need medications administered during the school day, requiring staff to administer the medications. Our Professional Judgment Panel meetings with Wyoming educators confirmed that all of these issues are present in Wyoming today.

The implication of these declining conditions of school children are that schools need more counselors, mental health providers, nurses and perhaps even psychologists. Unfortunately, only three states provide counselors at the rates recommended by the American School Counselor Association of one counselor for every 250 students. Only three states meet the standard of one school psychologist for every 750 students. And few if any states meet the standard of one nurse for every school or one nurse for every 750 students, promulgated by the National Association of School Nurses (2020).

Counselors

Research shows that well designed and implemented counseling programs can have significant and positive impacts on student learning; progress through elementary, middle, and high school; graduation from high school; and postsecondary enrollment. Studies in Connecticut, Indiana and New York found that school counselor programs that reflected the 1:250 ratio of the American School Counselor Association had significant, positive correlations with lower high school student absenteeism and higher SAT math, verbal and writing scores (Parzych, Donohue, Gaesser, Chiu, 2019). Lapan, Gysbers, Bragg, & Pierce (2012) found that Missouri high schools that had lower student-to-counselor ratios had higher student graduation rates, a finding that was strongest for schools with concentrations of Title I eligible students. Wilkerson, Perusse, & Hughes (2013) showed that elementary school counselor programs in Indiana that used the model of school counselors developed by the American School Counselors Association produced significantly higher elementary student proficiency rates in math and English/language arts than schools that did not. Other studies have found that well designed and implemented group counseling programs, especially for African American and ELL students, can increase those students' achievement scores as well as reduce demographic related achievement gaps (Bruce, Getch, & Ziomek-Daigle, 2009; Leon, Villares, Brigman, Webb, & Peluso, 2011). In sum,

[8] https://www.americashealthrankings.org/explore/annual/measure/Suicide/population/suicide_15-24/state/WY

schools that have counselor ratios at or below the 1:250 figure can produce multiple, and positive impacts on students, including increased achievement on state and local assessments.

In terms of the specifics of the job itself, school counselors provide multiple functions in schools. School counselors help all students:

- Apply academic achievement strategies
- Manage emotions and apply interpersonal skills
- Plan for postsecondary options (higher education, military, work force).

Appropriate duties for school counselors include providing:

- Individual student academic planning and goal setting
- School counseling classroom lessons based on student success standards
- Short-term counseling to students
- Referrals for long-term support
- Collaboration with families/teachers/ administrators/community for student success
- Advocacy for students at individual education plan meetings and other student-focused meetings
- Data analysis to identify student issues, needs and challenges.

The EB Model uses the standards from the American School Counselor Association[9] that recommend one counselor for every 250 secondary (middle and high school) students. This produces 1.26 counselor positions for a 315-student prototypical middle school and 2.52 counselor positions for a 630-student prototypical high school. Today many states require counselors in elementary schools as well. Even in states that do not require counselors at the elementary level, a growing number of elementary schools have begun to employ these personnel, including elementary schools in Wyoming. Further, research also shows that counselors in elementary schools can positively impact student performance. Consequently, the EB Model today includes one school counselor for a 288-student prototypical elementary school.

Social emotional learning

Counselors can also take the lead in developing a school's approach to social and emotional learning, a set of strategies to strengthen students' emotional health, relationship building, behavioral practices and mental health. Though social emotional learning should be thought of more as a schoolwide issue and a characteristic of a school's culture (Mehta, 2020), there are multiple programs and strategies that are known to be effective in improving students social-behavioral competence and mental health (Durlak, et al., 2011; Sheridan, et al., 2019). With the robust overall school staffing provided by the EB Model, including core school counselors and additional pupil support staff triggered by at-risk pupil counts in Element 27, schools have the resources to mount comprehensive strategies addressed to enhancing students' social and emotional learning and competencies.

[9] https://www.schoolcounselor.org/

Nurses

School nurses are also critical elements of the variety of pupil support staff today's schools need to address the rising incidence of health, physical, emotional and mental health needs of students. Consequently, the EB Model provides nurses as core positions. Drawing from the staffing standard of the National Association of School Nurses,[10] the EB Model provides core school nurses at the rate of one nurse position for every 750 students, prorated up and down with a minimum of a 0.5 nurse position in a district. Additional pupil support staff are provided by at-risk student counts as a way for the EB model to provide even more resources for the social, emotional, health and mental health needs of today's students.

Resource Use Analysis

In the 2018-19 school year, the Legislative Model allocated a total of 562 pupil support positions, including core counselors and nurses as well as additional pupil support staff provided by Element 27. Districts employed a total of 514 school and district level pupil support positions filled, 49 fewer than generated.[11]

Table 3.10.1 provides the number of counselors, nurses and other pupil support staff hired by Wyoming school districts in alternate years from 2010-11 to 2018-19. The data show several noteworthy patterns. First, districts hired hundreds of these staff. Second, over these nine years, the number of school counselors has remained about the same. Third, the number of school nurses – none of which are explicitly included in the Legislative Funding Model – was 125 in 2010-11 and rose to 165 by 2018-19, indicating the Wyoming districts feel the need to hire school nurses, and have hired more nurses over time. This is a trend around the country and an issue that emerged in our discussions with Wyoming educators – the need for more nurses. This is one reason nurses have been included in the EB Model as a specific staff allocation. Fourth, districts hired a number of speech pathologists, school psychologists and school social workers every year, though the numbers of these individuals outside of special education dropped over these nine years; our hypothesis is that many of the dropped positions have been shifted to the special education program. The bottom line is that Wyoming school districts have hired a variety of counselors, nurses and other pupil support staff over the years, all outside of special education. And as this section has argued, the declining social, emotional and health conditions of children have undoubtedly played a role in these decisions.

Table 3.10.1 Counselors, Nurses and other Pupil Support Staff, Alternate years -- 2010-11 to 2018-19.

ASSIGNMENT_DESCRIPTION	2010-11	2012-13	2014-15	2016-17	2018-19
School Counselor - Other than special education	235.34	230.64	240.91	252.86	239.34
School Nurse - Other than special education	124.73	146.05	152.73	157.99	165.03
At-Risk Student Case Manager or Transition Coordinator - Other than special education		3.88	4.51	5.20	4.20
Audiologist - Other than special education	2.00	1.00		1.00	1.00

[10] https://www.nasn.org/
[11] WDE sft_crew_staffing_table_4 (downloaded May 12, 2020)

ASSIGNMENT_DESCRIPTION	2010-11	2012-13	2014-15	2016-17	2018-19
Community Support Specialist - Other than special education	11.87	13.27	15.23	11.94	11.73
Intern - School Psychology	1.00	1.00		1.00	1.00
Physical Therapist - Other than special education	4.00	1.92	2.00	1.00	
Occupational Therapist - Other than special education	21.95	8.60	10.00	9.90	5.67
Psychological Technician - Other than special education	4.00	2.00	4.00	1.00	1.00
Speech Pathologist - Other than special education	75.92	25.72	35.05	25.45	26.60
School Psychologist – Other than special education	43.11	16.65	17.33	12.76	13.70
School Social Worker – Other than special education	70.19	44.21	44.35	46.34	44.30
Total	**594.10**	**494.95**	**526.11**	**526.43**	**513.58**

Data provided by LSO using WDE Data

The 2015 EB model would have provided 756 pupil support positions, including both core and at-risk triggered positions, 172 more than the legislative model. Specifically, the 2015 EB Model would have provided 345 counselor positions, 123 nurse positions and 288 at-risk triggered pupil support positions. Theses allocations are provided to address the declining social, emotional, and health conditions of children.

PJ Panel Comments on Counselors and Nurses

During our PJ Panel meetings with Wyoming educators, we heard nearly everyone express the need for more pupil support staff, including significantly more resources to address the health and mental health needs of Wyoming's school children. Wyoming educators, who stated in 2015 that students needed enhanced mental health services, were particularly aware in 2020 of the loss of mental health services for students due to the state's reduction of mental health resources in non-education agencies as well as cuts to the Child Development Centers.

There was nearly universal support for additional counselors, along with a feeling that the category should be called "counselors" not "guidance counselors" as individuals in these positions provide much more than simply counseling about school programs, college and careers – the traditional role of a "guidance" counselor. Participants felt strongly that more counselors, social workers and psychologists were needed due to the increasing social and emotional needs of students in recent years. Several expressed concern over the impact of the COVID pandemic on student (and family) mental health and most felt that the end of the pandemic would not necessarily end the issues that have begun to surface.

Participants also felt the model needed to include nurses – and pointed to the number of districts that employed nurses even in the absence of funding through the legislative model. They described the growing need to provide medications for students during the school day and expressed concern about the district's liability if clerical staff at schools dispensed medicines in lieu of a trained nurse.

A number of participants stated that "there should be a counselor in every school building in the state" and several also stated there should be a nurse in every building as well. Many indicated that these should be full time positions.

2020 EB Recommendation

Provide 1.0 school counselor position for each prototypical elementary school (288 ADM) and 1.0 school counselor position for every 250 middle and high school ADM. Provide 1.0 school nurse position for every 750 ADM. In addition, we recommend that each district be resourced with a minimum of a 1.0 counselor and 0.5 nurse.

11. Supervisory Aides

The 2020 EB Model recommendation is unchanged from 2015 and provides two supervisory aides positions for each 288-student prototypical elementary school, and 315-student middle school, as well as three supervisory aide positions for each 630-student high school.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
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.	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 each prototypical high school (630 ADM); resourced at the highest-grade prototype using total school ADM.	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.	-81 FTEs -$1.4 million

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Elementary, middle and high schools need staff for non-instructional responsibilities that include lunch duty, hallway monitoring, before and after school playground supervision, and others.

Covering these duties generally requires an allocation of supervisory aides at about the rate of two supervisory aide positions for a school of 400-500 students.

However, research does not support the use of instructional aides for improving student performance. As noted above (Element 2), the Tennessee STAR study, which produced solid evidence through field-based randomized controlled trials that small classes work in elementary schools, also produced evidence that instructional aides in a regular-sized classroom do not add instructional value, i.e., do not positively impact student achievement (Gerber, Finn, Achilles & Boyd-Zaharias, 2001).

At the same time, districts may want to consider a possible use of instructional aides that is supported by research. Two studies show how instructional aides could be used to tutor students. Farkas (1998) has shown that if aides are selected according to clear and rigorous literacy criteria, are trained in a specific reading tutoring program, provide individual tutoring to students in reading, and are supervised, then they can have a significant impact on student reading attainment. Some districts have used Farkas-type tutors for students still struggling in reading in the upper elementary grades. Another study by Miller (2003) showed instructional aides could also have an impact on reading achievement if used to provide individual tutoring to struggling students in the first grade. Neither of these studies supports the typical use of instructional aides as general teacher helpers.

Resource Use Analysis

The Legislative Model resourced 632.7 supervisory aides in SY 2013-14, while school districts actually employed 829.6 aides, a total of 196.9 more than funded. For SY 2018-19, the Legislative Model resourced 643.1 aide positions while districts hired 769.6 aides, for a difference of 125.6 more aides than were funded.[12]

In our School Use of Resources studies following the 2005 recalibration (See Picus, et.al. 2008 and Odden, et. al. 2009), we found a number of schools that employed instructional aides. Table 3.11.1 shows that is still common practice, although we do not know whether instructional aides have the training and experience Farkas found to help improve student reading attainment. The Table shows that school districts hire large numbers – hundreds – of instructional aides and very few supervisory aides. The paucity of supervisory aides means in many cases teachers have non-instructional duties – such as hall, lunch or bus duties – and thus less time to engage in PLC activities. But it appears that districts take the substantial allocation of supervisory aides and use them as instructional aides.

[12] Source: CRERW Table sfp_crerw-appendix_d.

Table 3.11.1. Numbers and Types of Aides, SY 2011-12 to 2018-19

	School Year								
Assignment Code	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Aide - Instructional - OTHER THAN Special Education	669.95	579.97	572.17	586.16	576.67	524.80	517.21	515.93	531.22
Aide - Non-Instructional (including playground) - OTHER THAN Special Education	95.83	145.77	152.59	152.01	156.44	158.85	138.46	137.81	136.52
English Learner Aide (formerly English as a Second Language Aide)	50.27	47.45	47.00	46.95	48.63	44.78	39.27	43.07	42.26
Aides, Library/Media (include Audio/Visual Support)	190.76	188.07	184.03	179.73	180.22	175.66	171.12	170.02	169.42
Title I Aide - Instructional	10.88	7.96	15.27	16.68	7.73	13.44	22.30	14.67	12.85
Title I Aide - Non-Instructional						0.81	0.81	0.78	0.81
Career Technical Education Aide	4.67	5.53	5.99	5.09	5.40	5.51	5.14	4.37	1.23
Grand Total	1,022.36	974.75	977.05	986.61	975.09	923.85	894.31	886.65	894.31

PJ Panel Comments on Supervisory Aides

There was relatively little discussion of supervisory aides, though panelists reported a wide variety of uses of these staff resources. Some districts used them more as instructional aides than for the intended purpose of supervision before and after school and during lunch. Some use supervisory aides as "teacher extenders" to help with instruction. Others relied on supervisory aides to keep teachers from duties during lunch and before and after school. Other districts did not have supervisory aides; one district indicated it used the funds to increase salaries.

There was one recommendation that there should be a minimum of one supervisory aid per school. One district hired supervisory aides that were certified as substitutes so they could also serve as substitutes.

In general, those who used supervisory aides felt they were for safety and to relieve teachers of extra, non-instructional duties. Schools/districts that did not use supervisory aides left much of that supervision to teachers or potentially other school staff.

2020 Evidence-Based recommendation

Provide funding at an amount equal to two supervisory aide positions for each prototypical elementary school (288 ADM); two supervisory aide positions for each prototypical middle school (315 ADM); three supervisory aide positions each prototypical high school (630 ADM); resourced at the highest-grade prototype using total school ADM, prorated down to 49 ADM and prorated up to the school's enrollment. This represents no change from the 2015 EB recommendation.

12. Librarians and Librarian Media/School Computer Technicians

Most schools have a library, and staff resources must be sufficient to operate the library and to incorporate appropriate technologies into the library system.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
Librarian Positions: For elementary schools, provide librarian resources at the following levels: for elementary schools with ADM less than 96 ADM, prorate a 0.50 librarian position down; for elementary schools with ADM between 96 and 143, provide a 0.50 librarian position; for elementary schools with ADM between 143 and 288, provide a 1.0 librarian position prorated down to 143 ADM. For middle and high schools, provide librarian resources at the following levels: for middle and high schools with ADM less than 105 ADM, prorate a 0.50 librarian position down; for middle	Librarian Positions: Provide 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 prorate down and above 630 ADM prorate up.	Librarian Positions: For elementary schools, provide librarian resources at the following levels: for elementary schools with ADM less than 96 ADM, prorate a 0.50 librarian position down; for elementary schools with ADM between 96 and 143, provide a 0.50 librarian position; for elementary schools with ADM between 143 and 288, provide a 1.0 librarian position prorated down to 143 ADM. For middle and high schools, provide librarian resources at the following levels: for middle and high 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 middle and high	-51 Librarian FTEs -$3.8 million (75%) -$1.8 million (85%)

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
and high schools with ADM between 105 and 157.5, provide a 0.50 librarian position; for middle and high 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 Aide Positions: For elementary schools, provide library aide resources at the following levels: 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 Media/Computer Technician Position: Provide 1.0 library media/computer technician position for every 315 middle and high school ADM, prorated up and down.	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 Aide Positions: For elementary schools, provide library aide resources at the following levels: 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 945ADM prorate up 1.0 library aide for every additional 630 ADM. School Computer Technician Position directed by District: Provide 1.0 school computer technician position for every 630 district ADM, with a minimum of a 0.5	53 Library Aide FTEs $2.4 million 6 Computer Technician FTEs $0.8 million Net Total for all library staff: 26 FTEs $1.4 million

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
library aide for every additional 630 ADM. School Computer Technician Position directed by District: 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.		position for each district.	

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

The following discusses library staffing in a manner that distinguishes library staff – librarians and library aides– from computer technicians who provide computer technical help to schools. This analysis further clarifies how computer technicians (what the Legislative Model terms library media/computer technicians) evolved from individuals who set up audio-visual equipment for teachers, to individuals who became the first line computer technical helpers and should be considered a separate staff category. These computer technicians typically operate out of the district's technology office and not the library, though they are often supervised when on campus by school principals in schools large enough to generate a full position or more.

The importance of the school library as a resource-rich learning center has developed and evolved with the addition of technology. In libraries, students can explore and individualize their learning experience, using all modalities of learning, through access to both electronic and print materials that enhance the curriculum. Both electronic and print materials were previously located primarily in the library, but that has changed. The majority of digital library resources have moved from being available only over school and library networks to being available anytime and anywhere through the internet. This allows students to access the "library" if they have a computer and an internet connection. With this shift, the value of the library as a physical location that provides access to electronic resources has declined, yet this same change enhances the librarian's role as a guide to digital resources, a teacher of digital media literacy, and an important member of the school's instructional literacy teams.

Librarians act as a partner in student achievement, assisting students to hone their 21st Century skills and preparing them to be successful in the post-secondary environment and the workplace. The library experience becomes more valuable to students and staff when libraries are staffed with certificated librarians and library aides that help students effectively search, cull, and synthesize information found in books, magazines, and myriad internet resources.

Although the methodology and rigor used in school library research varies, an increased number of library staff and operating hours are generally associated with higher academic outcomes. There is considerable anecdotal data about how librarians may enhance student learning and achievement; however, until recently there have been few empirical studies. Some studies demonstrate positive benefits; yet many of these benefits could be attributed to other sources or resources. It is difficult to establish direct causality (American Association of School Librarians, 2014). Despite these challenges, various research sources report libraries and librarians can play a role in increasing student achievement.

In 2003, six states conducted studies of the impacts of librarians on student achievement: Florida, Minnesota, Michigan, Missouri, New Mexico and North Carolina. The general finding was, regardless of family income, children with access to endorsed librarians working full time performed better on state reading assessments (Rodney, Lance & Hamilton-Rennell, 2003; Lance & Hofschire 2012). The Michigan study found that regardless of whether the librarian was certified, student achievement was better for low-income children, but having an endorsed librarian was associated with higher achievement than having an unendorsed librarian (Rodney, Lance, & Hamilton-Rennell, 2003). Each state examined the issue differently, but library staffing and the number of operating hours were generally associated with higher academic outcomes.

More recent statewide studies suggest that school libraries and librarians do have an impact on student achievement including increasing standardized test scores and student mastery of academic performance standards regardless of school funding levels or demographics (Curry & Kachel, 2018; Scholastic, 2016; Coker, 2015). National longitudinal research utilizing data from the years 2005 and 2011 indicated that states that increased the number of librarians over time had greater gains in fourth grade reading scores on the National Assessment of Educational Progress (NAEP) than states that lost librarians (Lance & Hofschire, 2012). Related research, emphasizes that the role that the school librarian plays within the school can become more impactful when the librarian is an integral part of the school faculty and acts as a member of the "literacy instruction team" [grade or subject collaborative teams] or as a technology coach (Lewis, 2016; Reed, 2018; U.S. Department of Education, 2017).

Libraries must be adequately staffed and be open to students or groups of students. Research is silent on the number of staff members required to provide adequate service to school staff and students. Because of the lack of literature on library staffing numbers, it is appropriate to examine general practices across states to understand what is working in school libraries across America.

The EB Model recommendations for library staff in Wyoming are derived from staffing practices and statutes in other states and from research, where it exists. It should be noted that the current Legislative Model differs from the staffing recommendations found in the EB Model.

The major differences between the EB and Legislative Models are:

- Both models provide for a librarian at each prototypical school but the EB model provides for library aides or clerks for larger schools while the Legislative Model prorates up fully fledged librarians. However, schools generally employ just one librarian and then additional library aides in larger schools (see table 3.12.1 below).
- The 2015 revised EB recommendation renamed the Legislative Model's library media technician to a computer technician. This trend continues in the 2020 EB Model as technology proliferates and requires staff who have expertise to support both the hardware and software aspects of electronic educational resources and information literacy.
- The EB Model recommendation provides computer technician resources at the district level rather than the school level although the district may assign a specific technician to a larger school for consistency,
- The Legislative Model provides school computer technicians at the rate of one for every 315 middle and high school students, whereas the 2020 EB Model recommendation provides one position for every 630 ADM or a minimum of 0.50 position for district with 500 or fewer ADM or (Note: these positions are meant to provide schools with individuals who can provide first line computer technical assistance). Note that these recommendations are quite similar as one position for every 315 secondary students produces approximately the same number of school computer technician positions as one position for every 630 total ADM. Given this, we suggest simplifying the Legislative Model for clarity to one position for every 630 total ADM.

Resource Use Analysis

Table 3.12.1 provides information on the actual use of library and computer technology staff as compared to allocations in the Legislative Model. The Legislative Model allocated 284.5 librarian positions in SY 2018-19. Districts employed 77.3 librarians, a difference of 207.2 FTEs. Districts employed 170.0 librarian aides, where the Legislative Model does not allocate library aide positions. When library aides are added to the librarians the total of 247.3 approaches the Legislative Model allocation of 284.5 librarian positions. It is not uncommon in Wyoming or other states for some schools to use librarian aides instead of librarians, and larger schools often staff libraries with a combination of one librarian and additional library aides, not multiple librarians. The Legislative Model allocated 138.2 school computer technicians for SY 2018-19 and districts employed 178.3 school computer technicians (after removing library aides), a difference of 40.1 more.

Table 3.12.1 Wyoming School District Librarians and School Computer Technicians

School Year	Legislative Model Librarian FTEs	Actual Librarian FTEs	Librarian Difference	Actual Librarian Aide FTEs	Legislative Model Computer Technician FTEs	Actual Computer Technician FTEs	Computer Technician Difference
2006-07	263.7	134.7	(129.0)	179.1	132.8	116.0	(16.8)
2007-08	265.0	134.5	(130.5)	184.1	131.6	142.3	10.7
2008-09	268.4	130.7	(137.7)	188.5	130.9	162.2	31.3
2009-10	271.6	127.8	(143.8)	191.0	130.9	168.3	37.4
2010-11	274.3	125.8	(148.5)	185.1	130.5	178.9	48.4
2011-12	277.0	124.2	(152.8)	190.8	132.5	177.8	45.3
2012-13	279.9	121.1	(158.8)	188.1	134.1	172.2	38.1
2013-14	283.8	110.6	(173.2)	184.0	135.0	179.9	44.9
2014-15	286.6	106.1	(180.5)	179.7	135.3	179.4	44.1
2015-16	286.9	107.4	(179.5)	180.2	135.6	189.7	54.1
2016-17	289.2	105.7	(183.5)	175.7	136.9	187.4	50.5
2017-18	288.8	86.4	(202.4)	171.1	138.3	183.4	45.1
2018-19	284.5	77.3	(207.2)	170.0	138.2	178.3	40.1

Source: CRERW Table sfp_crere_appendix_d; Data provided by WDE April 2020.

Librarians and Librarian Media Aides: The 2020 EB Recommendations

The 2020 EB recommendations allocate library staff to more closely align to general practices throughout the country and are identified in Table 3.12.2. The revised EB recommendation begins with school site ADM counts to allocate library staff. The basic revised formula provides one librarian for each prototypical 288 ADM elementary school and one librarian for each prototypical 315 ADM middle or high school. Below the prototypical levels, 288 elementary and 315 secondary students, the librarian position is prorated down, but to a minimum of 0.5 FTE. Once the elementary ADM falls below 96 or the secondary ADM falls below 105, the 0.5 FTE librarian position is prorated down. For small districts, the revised EB recommendation is to provide a minimum of one librarian position for each district.

Table 3.12.2 2020 EB Model Staffing Formula for Librarians and Library Aides

Elementary Level - School Site		Secondary Level - School Site	
ADM	**FTE**	**ADM**	**FTE**
Librarians – *minimum of 1.0 FTE for each district*			
< 96	0.5 Librarian prorated down	<105	0.5 Librarian Prorated down
96-143	0.5 Librarian	105-157.5	0.5 Librarian
144-288	1.0 Librarian at 288 ADM, prorated down to 0.5 at 144 ADM	157.5-315	1.0 Librarian at 315 ADM, prorated down to 0.5 at 157.5 ADM
Library Aides			
576	1 Library Aide prorated up from 288	945	1 Library Aide prorated up from 315
1,206	1 Library Aide prorated up from 288 and 1 prorated up from 576	1,575	1 Library Aide prorated up from 315 and 1 prorated up from 945

For elementary schools, Library aides would be generated at the rate of one for the first additional 288 ADM and then one library aide for every additional 630 ADM after the first 576 ADM (Note: it is highly unlikely an elementary school will have more than 576 ADM). For secondary schools, library aides would be generated at the rate of one for the first additional 630 ADM over 315 ADM and then one library aide for every additional 630 ADM after the first 945 ADM. This staffing level ensures large libraries are staffed by one full time librarian and one full time library aide, not multiple librarians. This recommendation also is more reflective of national trends and Wyoming practice. Table 3.12.2 shows how librarians and library aides would be resourced for elementary and secondary schools of varying size.

Librarians: Staffing Comparisons Using Different Models

In analyzing library staffing totals, it is instructive to compare the staffing levels of the Legislative Model and the revised EB Model to national school library staffing averages.

NCES Data Sets

In 2011-12, through an extensive survey of school libraries, the National Center for Educational Statistics (NCES) calculated average library staff in school libraries at both the elementary and secondary levels (NCES, 2015). In the 2011-12 data, NCES categorized and counted library personnel into three categories; librarians/media (aide) specialists, other professional staff, and other paid staff.

In 2015, NCES again studied the issue of school library staffing; unfortunately, the data set no longer had the detail of the previous 2011-12 study. The 2015 study only analyzed the number of librarians; it failed to ask if other types of employees such as librarian media (aide) specialists or other professional/paid staff performed librarian functions. The 2015 study also used different school size ranges and did not disaggregate school size ranges by school type (elementary, middle and high)

When comparing the two data sets, it would appear that the number of individuals supporting school libraries dropped from 2011-12 to 2015-16; however, if positions other than librarian had been counted in the later data set, the total number of “library staff” may have only changed modestly.

Using the latest 2015-16 data from NCES regarding school library personnel, for schools between 100 to199 students, NCES found the average school librarians was 0.71 FTE. As the number of students in a school increased to 750 students and higher, the number of librarians grew to 0.99 FTE. While the student population more than tripled, total librarians only increased by approximately 40%.This example demonstrates that as school size increases, total average library staff increases at a slower rate implying that once a library has sufficient staff to meet the basic demands such as opening the doors and running the counter, additional personnel are hired at a much slower rate and in many cases not at all.

NCES Averages and the Legislative Model

In comparing the Legislative Model to NCES data, we use the closest NCES school size average, 200 to 499 students, to compare to the legislative model 288 student prototypical elementary school. The legislative model allocates 1.0 librarian in this case, compared to the NCES average of 0.87, which amounts to 0.13 librarians more than the 200-499 student average reported by NCES.

As school size increases, the Legislative Model continues to resource more than the national average for library staff. For example, with an elementary school of 750 students, the Legislative Model resources 2.60 librarians for an elementary school and 1.19 for a secondary school while the NCES average school of this size would have only 0.99 librarians.

The Legislative Model does not stop or throttle back the allocation of library staff after basic staffing has been met, but instead continues to provide additional librarian staffing based on the increasing numbers of students at any particular school site.

The Legislative Model and the later 2015 NCES study are silent on positions beyond librarian. In Wyoming we know that some of the funding for these librarians is used to fund library aides. We also know from the 2011-12 NCES library data set that other positions beyond librarian exist in other schools nationwide. Wyoming accounts for these additional personnel by funding librarians in general while NCES no longer collects data on these additional staff members.

NCES Averages, the Legislative Model and the Revised EB Recommendation

In an elementary school of 288 students, the EB recommendation provides the same librarian staffing (1.0 FTE) as the Legislative Model (1.0 FTE), but more than the national average (0.87 FTE), though the difference is small. However, after 288 students, the EB Model adds library aides prorated up for every additional 288 students while the Legislative Model adds additional librarians prorated up for every additional 288 students. If an elementary school had 500 students, the EB recommendation provides the same number of staff as the Legislative Model

(1.74 FTE) but the EB recommendation provides 1.0 librarian and 0.74 library aides while the Legislative Model provides 1.74 librarians.

At 500 students, the NCES average provides 0.91 librarians; however, the new NCES data no longer track the number of library aides or other library personnel. The 2011-12 NCES data did have an additional 0.70 of other professional staff and paid employees. Using this additional NCES staffing number with the 0.91 librarian provides 1.61 librarians and library staff, close to both the EB Recommendation and the Legislative Model in practice (practice being substituting some librarian allocations to fund library aides).

Librarians: Secondary Level

NCES Averages, the Legislative Model and the Revised EB Recommendation

Using NCES data from both 2011-12 and 2014-2015, at the secondary level for schools of 500 students, NCES estimated total average library staffing at 1.61 FTE, consisting of 0.91 school librarians/media specialists, 0.21 other professional staff, and 0.59 other paid employees. As the secondary school increases in size to between 750 to 1,499 students, total staffing increases to 2.20 FTE, comprised of 1.22 librarian/media specialists, 0.14 other professional staff and 0.84 other paid employees.

The EB recommendation and Legislative Model call for 1.0 school librarian/media specialist for a 315 ADM or greater secondary school. This is higher than NCES averages for the librarian/media specialist that generate between 0.91 school librarians/media specialists (500 students) and 0.99 school librarians/media specialists (750 students).

As the secondary student count rises to 1,260 students, the 2020 EB recommendation still generates 1.0 librarian/media specialist but adds 1.5 library media aides for a total of 2.5 library staff. NCES school respondents report 1.22 librarians at this number of students and 0.98 other library staff, or 2.20 total staff. Under the Legislative Model the same 1,260 student school would be provided 2.0 FTE library/media specialists. Although the three models only diverge by 0.5 FTE with the Legislative Model generating the least staff at 2.0 FTE, this divergence happens at schools with higher student counts; however, at lower student counts at the secondary level, the Legislative Model and EB recommendations are somewhat more generous than NCES averages.

School Computer Technicians: Staffing Comparisons Using Different Models

The Legislative Model resources library media/computer technicians (now called school computer technicians in the EB Model) at a rate of one for every 315 middle and high school ADM, prorated up and down, for all non-alternative schools and non-small schools. The 2020 EB recommendation for this element resources school computer technicians at the district level at the rate of one for every 630 total ADM, but with a minimum of 0.5 FTE position for each district.

The school computer technician position has evolved. Decades ago, these individuals set up film strip and movie projectors and portable screens. Their responsibilities evolved to configuring computers and showing teachers how to set up tricky new peripherals like printers and LCD projectors and connect them directly to classroom computers. As in-school networks were built, these technicians helped create local login names for students who accessed resources on local school servers. Now as network connections among schools, the district, and the Internet have gained capacity and matured, these technicians configure Chromebooks to utilize the cloud to access educational resources that exist at the district, state, or national level. Computer operating systems have progressed to the point where computers can discover network-available projectors and printers through wireless connections allowing technicians to focus on more difficult issues and to manage the larger local school inventory of computers and devices.

For teachers and other staff to take full advantage of the benefits technology can provide, they need to feel support is close by or a phone call or email away. Having a school computer technician on campus can generate a sense of technological security. The work of the computer technician is cyclical; they are busiest at the beginning of a school year or during the deployment of a new resource or software. After peak demand cycles, technicians can address routine maintenance and other technological housekeeping. Even when moving to a one-to-one program, with the improvements to hardware, cloud software, and operating systems that have evolved over the last 10 years, the number of school computer technicians generated by the EB Recommendation is common in other states and districts and should be adequate to provide the necessary technical support to students and staff.

General support for computers and for their maintenance and configuration has traditionally been district-based. School sites submit service requests to the district and wait to see when a technician will come. In the EB recommendation, central district technology staff still handle the more difficult issues, while school computer technicians have most of their time scheduled by a district administrator to be at specific campuses. When a site has the ADM to generate a full technician, these individuals may participate at a particular site like a staff member and can be directed during their scheduled time by the principal and/or other site administrators. However, even though these individuals may be at a specific site, the district should be able to redirect them for specific deployments or other cyclical technical needs.

The Legislative Model allocated 138.2 school computer technicians in SY 2018-19. School districts employed 348.3 of these positions, a difference of 210.1.[13] In Wyoming, library aides are included in the general reporting category of “computer technicians.” If library aides are removed from the “computer technicians” category, the count drops to 178.3, a difference of only 40.1 FTE more statewide than the Legislative Model.

PJ Panel Comments on Librarians

All PJ panels that discussed librarian staffing and computer tech staffing felt that librarians were needed, and ideally certified librarians should be widely available. There was some but not much discussion of the difference between certified librarians and library aides; some districts had a librarian in every school, others less so. Many panelists indicated that schools often shared

[13] Source: CRERW Table sfp_crere_appendix_d

librarians, and other schools relied more on aides than librarians to manage library services. No one directly said the current model was inadequate, but some indicated more librarians, or even library aides, would be helpful.

In terms of computer tech positions, most responders thought they were important and particularly as districts move to more 1:1 computing, additional computer tech staff who focused on using instructional tools and learning management systems (e.g., Canvas) were critical. There was less discussion about the need for computer technicians to repair computers, but most of the technology staff who participated indicated that much of that need is for more centralized computer services like networks, servers, and connections to the internet. All seemed to feel this was important as technology is becoming generally more infused throughout the school day.

2020 Evidence-Based recommendation

Librarians and Librarian Aides

Provide one librarian for each 288-student prototypical elementary school and to each 315-student prototypical secondary school. Below those levels (288 elementary and 315 secondary), prorate the librarian position down but to a minimum of 0.5 position. Prorate down that half-time position once elementary ADM falls below 96 and secondary ADM falls below 105, down to 50 ADM. For elementary schools, prorate up one library aide position for the first additional 288 students. For secondary schools, prorate up one library aide position for the first additional 630 students. Above 576 elementary students and 945 secondary students provide one library aide position for every 630 students. Provide a minimum of one librarian position for each school district.

School computer technicians

Provide school computer technicians at the district level at the rate of one position for every 630 district ADM, but with a minimum of 0.5 FTE position for each district.

13. Principals and Assistant Principals

Every prototypical school needs a principal. Larger schools need assistant principals as well.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
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 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, prorated by ADM	Provide 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools.	Principals: -16 FTEs $2.7 million

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
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 middle and high school ADM beginning at 316 ADM and for middle and high schools below 105 ADM Resourced at the highest-grade band level.	below 105 ADM down to 49 ADM, resourced at the highest-grade band level. Provide 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.	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 middle and high school ADM beginning at 316 ADM and for middle and high schools below 105 ADM Resourced at the highest-grade band level.	Assistant Principals: 0 FTE difference $1.0 million *Alternative school principals -21 FTEs*** -$2.2 million *Small School Assistant Principals 43 more FTEs*** $6.0 million

*The source for all cost differences reported in this chapter is a simulation model developed specifically for the 2020 recalibration process.
** Note that the Legislative Model provides separate funding for alternative schools whereas the EB model does not and treats all alternative schools as small schools. For ALE schools, the EB Model uses the same formulas as used for small schools with 49 or fewer ADM and schools with more than 49 ADM, assuming that alternative schools are typically very small schools with no more than 50 students. As a result, the bulk of the Legislative Model's staffing of teachers and assistant principals for ALE schools appear as staffing for small schools for the EB Model.

Analysis and Evidence

Much has been written about the importance of school principals. Studies of schools that boost student learning always discuss the important role of the principal. Nearly all high performing schools, including those we have studied as part of state adequacy projects, have strong principal leaders.   Chenoweth and Theokas (2011) provide one of the most readable descriptions of the various role's principals play in creating and leading effective schools. These roles include instructional leadership, managing the building, creating a culture of respect and high expectations for students and teachers, and managing outside relationships. Principals who want to "get it done," meaning produce large gains in student learning while also reducing achievement gaps, would be wise to read this helpful book.

Chenoweth's (2017) most recent book on cases of schools that improve student achievement provides additional details on the management and leadership tasks of principals who have successfully turned around schools, started effective schools from scratch, or led schools to even higher levels of performance. Neumerski (2012) reviews the knowledge about the principal's role in instructional leadership, and updates that knowledge base in relation to current findings on the emerging roles of teachers and instructional coaches – individuals who also provide instructional leadership inside schools. Her review identifies ways all three roles can be integrated to ensure that a robust set of coordinated, direct and indirect instructional leadership functions exist in schools – all of which are compatible with the EB model's leadership resources.

Liebowitz and Porter's (2019) review of the impact principals have on critical elements of schools – including student performance – found that principals have large and significant effects on all aspects of schools including: student achievement (effect size up to 0.16 SD); teacher well-being (~0.35); teacher instructional practice (0.35); and, school organizational health (0.72-0.81). These results provide evidence that principals positively impact both instructional leadership and overall school management, so both skills are important for their schools to be effective.

There is no research evidence on the performance of schools without a principal. The fact is that essentially all schools in America, if not the world, have a principal. All comprehensive school designs, and all prototypical school designs from all professional judgment and Evidence-Based studies around the country include a principal for every school unit (Aportela, Picus, Odden & Fermanich, 2014).

The EB model has always included principals in all prototypical schools. In Wyoming, the EB and Legislative models provide assistant principals for schools larger than the prototypes of 288 elementary and 315 middle and high school students. For Wyoming, assistant principals are prorated up at the rate of 1 for every 288 elementary and 315 middle and high school students. For schools that are smaller than the smallest school prototype at each level (that is less than a one-unit school) an assistant principal position is provided in the EB model. The current Legislative model prorates principal positions down to 49 ADM and uses an alternative approach for schools of 49 or fewer students. The EB model provides an AP position for all schools with fewer than 96 elementary or 105 secondary ADM.

Resource Use Analysis

The Legislative Model provided 423.5 school site administrators (principals and assistant principals) in SY 2013-14. Districts employed 373.8 school site administrators or 49.6 fewer than the model provided. In 2018-19, the Legislative Model provided 429.7 school site administrator positions (principals and assistant principals). Districts employed 364.5 or 65.2 fewer school administrators. Over the five years, the proportion of school site administrators employed by Wyoming school districts compared to the number provided through the Legislative model declined from 89.4 percent of the model's allocation to 84.8 percent of the model's allocation.[14]

[14] Source: sfp_crerw-staffing_table4

PJ Panel Comments on Principals and Assistant Principals

Many of the PJ panelists indicated that principal and assistant principal staffing was adequate. The larger districts seemed to have fewer assistant principals than the model generates for their schools/districts. There were comments that if the principals and assistant principals were resourced as the model indicated, then the resources were adequate. There were several individuals who thought that in buildings or campuses with multiple schools, elementary and secondary schools needed to have separate principals. One concern was finding a way to fund athletic directors either as assistant principals, or through special teacher assignments. This seemed to be an issue at a number of the high schools.

2020 Evidence-Based recommendation

Principals

Provide one principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, resourced at the highest-grade band level.

Assistant Principals

Provide one assistant principal position for every 288 elementary ADM beginning at 289 ADM and one assistant principal position for elementary schools below 96 ADM, resourced at the highest-grade band level. Provide one assistant principal position for every 315 middle and high school ADM beginning at 316 ADM and one assistant principal position for middle and high schools below 105 ADM, resourced at the highest-grade band level.

14. School Site Secretarial Staff

Every school site needs secretarial staff to provide clerical and administrative support to administrators and teachers, to answer the telephone, greet parents when they visit the school, help with paperwork, etc. Secretary positions are distinguished from clerical positions, the fundamental difference being secretaries have a 12-month appointment and clerical staff have a school year appointment.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
Secretarial Staff: Provide 1.0 secretary position for all prototypical schools down to 96 elementary ADM and 105 middle and high school ADM,	Secretarial Staff: Provide 1.0 secretary position for all prototypical schools down to 96 elementary ADM and 105 middle and high school ADM,	Secretarial Staff: Provide 1.0 secretary position for all prototypical schools down to 96 elementary ADM and 105 middle and high school ADM,	-6 Secretarial FTE -$0.1 million

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
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.	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.	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.	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 prototype using total school 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.	-82 Clerical FTE -$2.1 million

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

The secretarial ratios included in the EB Model generally are derived from common practices across the country. We conducted a search of education literature on school performance for the 2020 recalibration and our research assistants confirmed that they could not find any research on the impact secretarial and clerical staff have on student outcomes; yet it is impossible to have a school operate without adequate staff support. In 2015, we revised the EB Model recommendation for high schools as part of the 2015 recalibration effort. The revised EB recommendation for high schools was, and remains in 2020, to resource one clerical position for each 315-student prototypical high school (2 FTE for a 630 ADM high school as described in the table above), rather than two positions, as in the Legislative Model.

Resource Use Analysis

In SY 2013-14 the Legislative Model resourced 700.8 secretarial and clerical positions while school districts employed 622.6 or 78.2 fewer school level secretarial and clerical staff. In 2018-19, the Legislative Model provided 712.5 secretarial and clerical positions while districts hired 569.0 secretarial and clerical staff, or 143.5 fewer school level secretarial and clerical staff.[15]

PJ Panel Comments on Secretarial/Clerical Staff

There was very little discussion of this topic during the PJ panels. Two individuals indicated that the secretary/clerical allocation was adequate in their schools, and one suggested "it is a little thin" given the demands of student medical needs. On participant indicated that there were four secretary/clerical positions in his 550-student high school indicating it seemed thin, but the current Legislative Model would provide that school with approximately five positions, and the EB would provide between three and four total positions.

2020 Evidence-Based Recommendation

There is no need to change the EB recommendation at this time.

DOLLARS PER STUDENT RESOURCES

15. Gifted and Talented Students[16]

A complete analysis of educational adequacy should include the gifted, talented, able, ambitious and creative students, most of who perform above state proficiency standards. Gifted and Talented programs are important for all states whose citizens desire improved performance for students at all levels of achievement. Wyoming law (W.S. 21-9-101(c)(ii) requires the following: … each school district within this state shall provide programs designed for the special needs of those student populations defined within this subsection … (ii) 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."

[15] Source: CRERW table sfp_crerw_appendix_d.
[16] This section draws heavily on Robinson, 2007.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
Provide an amount equal to $44.08 per ADM, inflated annually.	Provide an amount equal to $44.07 per ADM.	Provide an amount equal to $40 per ADM, inflated annually.	-$376,446

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Research shows that developing the potential of gifted and talented students requires:

- Effort to discover the hidden talent of low income and/or culturally diverse students
- Curriculum materials designed specifically to meet the needs of talented learners
- Acceleration of the curriculum, and
- Special training in how teachers can work effectively with talented learners.

<u>Discovering Hidden Talents in Low-Income and/or Culturally Diverse High Ability Learners</u>
Research studies on the use of performance assessments, nonverbal measures, open-ended tasks, extended try-out and transitional periods, and inclusive definitions and policies produce increased and more equitable identification practices for high ability culturally diverse and/or low-income learners. A 2019 survey of 800 teachers of gifted and talented students and an additional number of district coordinators of gifted and talented programs, found that 60 percent of respondents reported that African American and ELL students were still underrepresented in gifted education; over 50 percent of respondents felt the same was true for children from poverty backgrounds as well as for children with disabilities (Mitchell, 2019). The results suggest the country, and probably Wyoming as well, still has a long way to go to meet the needs of all gifted children, especially these four subgroups (Harwin, 2019). Access to specialized services for talented learners in the elementary years is especially important for increased achievement among vulnerable students. For example, high-ability, culturally diverse learners who participated in three or more years of specialized elementary and/or middle school programming had higher achievement at high school graduation, as well as other measures of school achievement, than a comparable group of high ability students who did not participate (Struck, 2003). Gains on other measures of school achievement were reported by Struck as well.

<u>*Access to Curriculum*</u>

Overall, research shows curriculum programs specifically designed for talented learners produce greater learning than regular academic programs. Increased complexity of the curricular material is a key factor (Robinson & Clinkenbeard, 1998). Large-scale curriculum projects in science and mathematics in the 1960s, such as the Biological Sciences Curriculum Study (BCSC), the Physical Science Study Committee (PSSC), and the Chemical Bond Approach (CBA), benefited academically talented learners (Gallagher, 2002). Further, curriculum projects in the 1990s designed to increase the achievement of talented learners in core content areas such as language arts, science, and social studies produced academic gains in persuasive writing and literary analysis (VanTassel-Baska, Johnson, Hughes & Boyce, 1996; VanTassel-Baska, Zuo, Avery & Little, 2002), scientific understanding of variables (VanTassel-Baska, Bass, Ries, Poland & Avery, 1998), and problem generation and social studies content acquisition (Gallagher & Stepien, 1996; Gallagher, Stepien & Rosenthal, 1992).

Access to Acceleration

Because academically talented students learn quickly, one effective option for serving them is acceleration of the curriculum. Many educators and members of the general public believe acceleration always means skipping a grade. However, there are at least 17 different types of acceleration, ranging from curriculum compacting (which reduces the amount of time students spend on material) to subject matter acceleration (going to a higher-grade level for one class) to high school course options like AP or concurrent credit (Southern, Jones & Stanley, 1993). In some cases, acceleration means *content* acceleration, which brings more complex material to the student at his or her current grade level. In other cases, acceleration means *student* acceleration, which brings the student to the material by shifting placement. Reviews of the research on different forms of acceleration have been conducted across several decades and consistently report the positive effects of acceleration on student achievement (Gallagher, 1996; Kulik & Kulik, 1984; Southern, Jones & Stanley, 1993), including AP classes (Bleske-Rechek, Lubinski & Benbow, 2004). Multiple studies also report participant satisfaction with acceleration and benign effects on social and psychological development.

Access to Trained Teachers

Research and teacher reports indicate general classroom teachers make very few, if any, modifications for academically talented learners (Archambault, et al, 1993; Harwin, 2019), even though talented students have mastered 40 to 50 percent of the elementary curriculum before the school year begins. In contrast, teachers who receive appropriate training are more likely to provide classroom instruction that meets the needs of talented learners. Students report differences among teachers who have had such training, and independent observers in the classroom document the benefit of this training as well (Hansen & Feldhusen, 1994). Curriculum and instructional adaptations require the support of a specially trained coach at the building level, which could be embedded in the instructional coaches recommended (Element 7) (Reis & Purcell, 1993). Overall, learning outcomes for high ability learners are increased when they have access to programs whose staff have specialized training in working with high ability learners (Delcourt, Loyd, Cornell, & Golderberg, 1994), which could be accomplished with the professional development resources recommended (Element 16).

Overall, research on gifted programs indicates the effects on student achievement vary by the strategy of the intervention. Enriched classes for gifted and talented students produce effect sizes of about +0.40 and accelerated classes for gifted and talented students produce somewhat larger effectives sizes of +0.90 (Gallagher, 1996; Kulik & Kulik, 1984; Kulik & Kulik, 1992). A 2007 review of the research on gifted and talented education reached similar conclusions, finding that in addition to improving achievement among children identified as gifted, many gifted and talented programs also benefit non-gifted and talented students as well as students with disabilities (Field, 2007). A 2016 meta-analyses of 100 years of research on the effects of ability grouping and acceleration on the academic achievement of K-12 students reached similar conclusions about the impacts on gifted as well as non-gifted students (Steenbergen-Hu, Makel & Olszewski-Kubilis, 2016).

Practice Implications

At the elementary and middle school level, our understanding of the research on best practices is to place gifted students in special classes comprised of all gifted students and accelerate their instruction because such students can learn much more in a given time period than other students. When the pull out and acceleration approach is not possible, an alternative is to have these students skip grades in order to be exposed to accelerated instruction. Research shows neither of these practices systemically produces social adjustment problems. Many gifted students get bored and sometimes restless in classrooms that do not have accelerated instruction. The primary approach to serve gifted students in high schools is to enroll them in advanced courses, such as AP and IB, to participate in dual enrollment in postsecondary institutions, or to have them take courses through distance learning mechanisms. All of these strategies have little or no cost, except for scheduling and training of teachers, resources for which are provided by professional development (Element 16).

A Broader Approach to Giftedness

Over the past several years, we confirmed our understanding of best practices for the gifted and talented *defined as high achievers* with the directors of three of the gifted and talented research centers in the United States: Dr. Elissa Brown, Director of the Hunter College Gifted Institute and previously the Director of the Center for Gifted Education, College of William & Mary; Dr. Joseph Renzulli, The National Research Center on the Gifted and Talented (NRC/GT) at the University of Connecticut; and Dr. Ann Robinson, Director of the Center for Gifted Education at the University of Arkansas at Little Rock.

To broaden gifted and talented education practices, however, the University of Connecticut's Center on the Gifted and Talented developed a very powerful, internet-based platform, Renzulli Learning, which provides a wide range of programs and services for gifted and talented students. In 2005, Renzulli stated that such an approach was undoubtedly the future for the very creative student. Field (2007) found that after 16 weeks, students given access to an internet-based program, such as Renzulli Learning to read, research, investigate, and produce materials, significantly improved their overall achievement in reading comprehension, reading fluency and social studies.

Renzulli (2019) argues that underrepresentation of low income, minority, ELL and students with disabilities in gifted and talented programs begins at the word and definition of "gifted," which usually means identifying very high achieving students. Renzulli argues that many high performing students are different from students who have more creative and productive giftedness, but the latter have the kind of giftedness that is needed for innovation in the evolving global economy. Further, defining gifted as high achieving has the side effect of excluding children from non-white, non-middle-income backgrounds, as well as ELL students or students with disabilities.

Renzulli (2019) supports a different kind of gifted assessment that takes into account the characteristics of creativity and productivity. These characteristics include curiosity, interests, learning styles, expression styles, enjoyment and high engagement learning in particular areas. Equally important are co-cognitive skills such as collaboration, empathy, creativity, planning, self-regulation, and other executive functions skills. These are the kinds of skills that many Wyoming educators' reference when discussing gifted and talented education *and* these are the kinds of skills that lead to major innovations – think Steve Jobs, Elon Musk, Bill Gates. Renzulli Learning is a program that responds to this kind of giftedness. And its cost is modest.

The Renzulli Learning Center describes its program as an interactive online system that provides a personalized learning environment for students, resulting in increased engagement and higher academic performance. Through a comprehensive assessment system, the program quickly identifies student academic strength areas, interests, learning styles, and preferred modes of expression, and then matches each student with thousands of personalized, high interest, engaging educational activities and resources. Renzulli Learning enables teachers to easily differentiate instruction and increase motivation. Renzulli Learning personalizes talent development for each student, giving students the tools and resources to increase engagement and achievement.[17]

Our understanding is that the cost today is $5 per student if the entire district enrolls in the program. Districts can purchase school site licenses for $3,000 to provide all students full access to the program. There are other costs for some materials and site-delivered professional development-- $2,200 a day for a three-day program. If a figure of $40 per pupil were included in the EB Model, all districts would be able to afford this program for interested gifted, talented and otherwise creative students.[18]

Resource Use Analysis

Gifted and talented is basically excluded from the CRERW report analysis. Though there is an object code for gifted and talented education, it is likely that gifted program costs are expended under a variety of other accounting codes. Consequently, attempts to report gifted and program expenditures across school districts in Wyoming likely would vary from alternative decisions about how to account for the programs rather than differences in the level of resources devoted gifted and talented programs, and are not provided herein.

PJ Panel Comments on Gifted and Talented

There was substantial discussion about gifted and talented programs in several of the PJ sessions. Panelists seemed to be divided into two camps, those who followed the acceleration approach seemed to find funding to be adequate. Districts that use gifted and talented teachers to provide both advanced classes and other forms of enrichment argued that funding was inadequate and not

[17] https://renzullilearning.com/
[18] https://renzullilearning.com/pricing/

all gifted students were served. Very few were aware of the logic that tied the funding level to the Renzulli Learning Center programs. One district had a school with entire classrooms for gifted students at the elementary level. In at least one district, there was a gifted teacher at every school, and other districts employed gifted teachers who served students in multiple schools. In those cases, PJ panelists were certain that district expenditures exceeded the funding through the model.

As an example of the discussions that took place, one participant said that acceleration is not a good definition of gifted. That gifted and talented programs need to deal with higher order thinking and skills. She said that many gifted students take what they learn in gifted programs and apply that to other areas. She was not concerned about the level of funding and indicated that the Legislative Model resources did fully fund the program in her district, but she thought funding levels were better than they are in most states.

This participant indicated that she teaches a gifted class enrolling all gifted children. She indicated that while she likes the model, she is aware that there are detractors who worry about social interactions, etc. She argued that gifted students are also at risk and have high dropout rates, claiming they are often bored. While her program looks for the top 5 percent of students in the district, she argued that there is a misconception that gifted students don't have issues or are at risk. She argued teachers need to adjust the traditional curriculum to meet the needs of gifted children, and another challenge is not all gifted children are gifted in all areas, so schools need to accommodate that as well.

We asked one participant what they teach in gifted hours. She indicated that it is project-based learning. In 3rd grade, there is an economic unit. In 4th grade students work on an invention unit, and in 5th grade students prepare a project on an important historical person. She stated that the 6th grade used to have a career unit but now it's a bridge-building unit focused on the "engineering" of a bridge.

Another district has a self-contained gifted program. They have elementary self-contained program and a middle school program focused on electives. The district has a full-time gifted coordinator. Students qualify through testing. Parents can choose to send students to self-contained gifted program. Alternatively, the gifted works with teachers to support them in meeting the students' needs.

2020 Evidence-Based recommendation

Although there are substantial differences in approaches to gifted and talented programs across the state, we continue to recommend that the EB model provide an amount equal to $40 per ADM for SY 2021-22, which would enable all districts to access Renzulli Learning. Districts that seek to provide more expansive gifted programs can allocate funds through the block grant.

16. Intensive Professional Development

Professional development (PD) includes a number of important components. This section describes the specific dollar resource recommendations the EB Model provides for professional development. In addition to the resources listed here, PD includes the instructional coaches described in Element 7 and the collaborative planning time provided by the provisions for elective or specialist teachers in Element 4. Those staff positions are critical to an adequate PD program along with the resources identified in this section.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 10 days of student free time for training embedded in salary levels. Provide $137.72 per ADM for trainers.	Provide 10 days of student free time for training embedded in salary levels. Provide $137.74 per ADM for trainers.	Provide 10 days of student free time for training embedded in salary level. Provide $130 per ADM for trainers.	-$713,542

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

All school faculty members need ongoing professional development. Improving teacher effectiveness through high quality professional development is arguably one of the most important strategies for improving student performance. Better and more systemic deployment of effective instruction is the key aspect of the education system that improves student learning (Odden, 2011a; Raudenbusch, 2009; Rowan, Correnti, & Miller, 2002; Sanders & Horn, 1994; Sanders & Rivers, 1996; Webster, Mendro, Orsak, & Weerasinghe, 1998).

Moreover, all the resources included in the EB model need to be transformed into high quality instruction in order to increase student learning (Cohen, Raudenbush, & Ball, 2002). Effective professional development is the primary way those resources get transformed. Further, though the key focus of professional development is better instruction in the core subjects of mathematics, reading/language arts, writing, history, science, and world languages, the professional development resources in the EB Model are adequate to address the instructional needs for gifted and talented, special education, ELL students, for embedding technology in the curriculum, for new computer science courses and computational thinking, and for elective teachers as well. In addition, all beginning teachers need intensive professional development, first in classroom management, organization and student discipline, and then in instruction. The most effective way to “induct” and “mentor” new teachers is to have them work in functional collaborative teacher teams, discussed in Element 4.

There is substantial research on effective professional development and its costs (e.g., Crow, 2011; Joyce & Showers, 2002; Miles, Odden, Fermanich, & Archibald, 2004; Odden, 2011b). Effective professional development is defined as professional development that produces change in teachers' classroom-based instructional practice that can be linked to improvements in student learning. The practices and principles researchers and professional development organizations use to characterize "high quality" or "effective" professional development, draw upon a series of empirical research studies that linked program strategies to changes in teachers' instructional practice and subsequent increases in student achievement. Combined, these studies and reports from Learning Forward, the national organization focused on professional development (see Crow, 2011), identified six structural features of effective professional development:

- The *form* of the activity – that is, whether the activity is organized as a study group, teacher network, mentoring collaborative, committee or curriculum development group. Research suggests effective professional development should be school-based, job-embedded, focused on the curriculum taught and ongoing rather than a one-day workshop.

- The *duration* of the activity, including the total number of contact hours participants are expected to spend in the activity, as well as the span of time over which the activity takes place. Research has shown the importance of continuous, ongoing, long-term professional development that totals a substantial number of hours each year, at least 100 hours, and closer to 200 hours, when counting PLC hours devoted to instructional practice.

- The degree to which the activity emphasizes the collective participation of teachers from the same school, department, or grade level. Research suggests effective professional development should be organized around groups of teachers from a school that over time includes the entire faculty.

- The degree to which the activity has a content focus – that is, the degree to which the activity is focused on improving and deepening teachers' content knowledge as well as how students learn that content (i.e., pedagogical content knowledge). Research concludes teachers need to know the content they teach, need to know common student miscues or problems students typically have learning the content, and effective instructional strategies linking the two. The content focus today should emphasize content for college and career ready curriculum standards, and the content for the states' curriculum standards – the basket in Wyoming.

- The extent to which the activity offers opportunities for active learning, such as opportunities for teachers to become engaged in the meaningful analysis of teaching and learning for example, by scoring student work or developing, refining and implementing a standards-based curriculum unit. Research has shown professional development is most effective when it includes opportunities for teachers to work directly on incorporating the new techniques into their instructional practice *with the help of instructional coache*s (see also Joyce & Showers, 2002).

- The degree to which the activity promotes coherence in teachers' professional development, by aligning professional development to other key parts of the education system such as student content and performance standards, teacher evaluation, school and district goals, and the development of a professional community. Research supports tying

> professional development to a comprehensive, interrelated change process focused on improving student learning.

Form, duration, and active learning together imply that effective professional development includes some initial learning (e.g., a two-week – 10 day – summer training institute) as well as considerable longer-term work in which teachers work to embed the new methodologies into their actual classroom practice, with guidance provided by instructional coaches. Active learning implies some degree of collaborative work and coaching during regular school hours to help the teacher incorporate new strategies into his/her normal instructional practices. It should be clear that the longer the duration, and the more the coaching, the more time is required of teachers as well as professional development trainers and coaches.

Content focus means effective professional development focuses largely on subject matter knowledge, what is known about how students learn that subject, and the actual curriculum that is used to teach the content. Today this means a curriculum program to ensure students are college and career ready when they graduate from high school. Collective participation implies professional development includes groups of and at some point, all teachers in a school, who then work together to implement the new strategies, engage in data-based decision making (Carlson, Borman & Robinson, 2011) and build a professional community.

Coherence suggests professional development is more effective when the signals from the policy environment (federal, state, district, and school) reinforce rather than contradict one another or send multiple, confusing messages. Coherence also implies professional development opportunities should be given as part of implementation of new curriculum and instructional approaches, today focusing on the college and career ready standards. There is little support in this research for the development of individually oriented professional development plans; the research implies a much more systemic approach.

Each of these six structural features has cost implications. Form, duration, collective participation, and active learning require various amounts of both teacher and trainer/coach/mentor time, during the regular school day and year and, depending on the specific strategies, outside of the regular day and year as well. This time costs money. Further, all professional development strategies require some amount of administration, materials and supplies, and miscellaneous financial support for travel and fees. Both the above programmatic features and the specifics of their cost implications are helpful to comprehensively describe specific professional development programs and their related resource needs.

In a December 2016 review of the research on effective professional development, Kennedy (2016) generally identified the same structural features of effective professional development as outlined above. She also noted that when effective, the impact of a professional development program is usually stronger in the year following the program and the impact can increase even after that [for examples, see Horn (2010) and Pianta, Allen & King (2011)]. Her review included only programs lasting at least a year, whereas many less effective professional development programs are much shorter in duration. The take-away, we believe, is that professional development needs all the programmatic features identified above, should last at least a year long, and should be followed by intensive coaching of individual teachers in their classrooms – resources for all of which are included in the EB model.

In support of this conclusion, we reference an important recent analysis of the kinds of professional development that work for implementing STEM classes in schools, a national as well as Wyoming priority. Lynch et al., (2019) assessed results from 95 experimental and quasi-experimental studies of PreK-12 science, technology, engineering and mathematics professional development and curriculum programs. They found an average effect size of 0.21 standard deviations on student performance when the when the professional development specifically:

1) Helped teachers learn to use the new curriculum materials

2) Focused on improving teachers content knowledge, pedagogical content knowledge and/or understanding of how students learn that content

3) Included summer workshops, and

4) Included time during the school year for teacher groups to trouble shoot and discuss classroom implementation.

These findings provide specific support for several of the key elements of effective professional development outlined above plus the need for teacher collaborative groups during the school day/year. Finally, the meta-analysis also found wide variation in professional development program implementation and stressed that "fidelity" of implementation of all the elements of professional development is key to having the program produce the desired impacts on teachers' instructional practice and then student achievement.

The funding model's professional development resources should be used in the short and medium term to develop all teachers' instructional expertise to teach students computational thinking skills and computer science, a recent Wyoming addition to the education basket. Florez et al. (2017) identify a range of studies that have shown how computational thinking can be taught to students at all levels largely via teaching students programming, i.e., computer science. This links back to the previous discussion of the K-12 Project Lead the Way program (see Element 5 – Career and Technical Education), that teaches programming even to students in elementary grades. With this knowledge about how to teach computational thinking skills and the robust professional development resources in Wyoming's funding model, the state's education system has the tools and resources to help students succeed on this important new element of the state's education basket.

From this research on the features of effective professional development, the EB Model includes the following for a systemic, ongoing, comprehensive professional development program:

- Ten days of student free time for training embedded in the salary level, and
- Funds for training at the rate of $130 per student.

The resources for student free time and cost of training are in addition to instructional facilitators/coaches (Element 7) and collaborative work with teachers in their schools during planning and collaborative time periods (Element 4).

Resource Use Analysis

The Legislative Model allocated $10,645,056 for professional development training in SY 2013-14. The school districts reported expenditures of $8,281,858, or 77.8 percent of the funds they received for that purpose. For 2018-19, the Legislative Model allocated $ 11,652,050 for professional development training and districts spent $ 8,246,769, or just 70.8 percent of the allocation, a lower percentage than five years earlier.[19] We recommend the Legislature urge all school districts to fully use the professional development resources to help all teachers acquire the instructional strategies and skills needed to improve instructional practice in ways that boost student learning.

PJ Panel Comments on Professional Development

Panelists universally supported funds for professional development and generally supported the ten days of time for PD. A few felt that number of days was inadequate, while others said that their districts did not provide the full ten days. In two instances concern was expressed about ten days at the beginning of the school year as being too intense. Many discussed the importance of working with Instructional Facilitators/Coaches (IF) in developing and implementing PD and expressed concern over the loss of IF positions in their districts. One district used the PD funds for outside experts, to send faculty to conferences, and to support visitations in other states instead of bringing in speakers. The funds for speakers were highly thought of by participants; they felt it gave teachers access to some of the best thinking available and helped improve their teaching.

Statements favoring the current model included many saying their district uses all ten days, and that they get “lots” more PD than other states where they have worked. One person said she was “fantastic with PD.” Some districts provide more than the 10 days – this seemed mostly to happen in the larger districts. A number of participants also said that Federal funds are used to provide additional PD in their districts, and one suggested that might be why some districts do not spend all of their state funded PD resources.

Some concerns were expressed as well. There were a few who felt that ten days are not enough time, and at least one participant indicated that the teacher contract year should be increased above the current average of 185 days. Many concerns had less to do with the availability of funds and more to do with how PD was implemented in their district or school. One indicated that they were not getting PD in their district and another described the PD “hit or miss.”

Overall, there was support for the PD funding, and most panelists felt the 10 days were adequate to meet teacher PD needs. They liked the resources for outside consultants/speakers and felt it important to have enough Instructional Facilitators to help make the training (and instruction) more effective.

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[19] Source: CRERW Table sfp_crerw_appendix_b

2020 Evidence-Based recommendation

Provide 10 days of student free time for training embedded in salary levels and $130 per ADM for trainers other than the district's own instructional facilitators/coaches. To ensure that professional development dollars are used for a wide range of teacher professional development needs, the Legislature could consider putting the $130 per ADM into a categorical grant.

17. Instructional and Library Materials

The need for up-to-date instructional and library materials is paramount. Newer materials, whether digital or print, contain more accurate information and incorporate the most contemporary pedagogical approaches. Common standardized print and digital materials offer a structure, an order, and a progression in the teaching and learning process that allow teachers to pace instruction and work together as a collaborative team. Almost all traditional print textbooks now include supplemental digital data and/or media that are delivered with the teachers' edition or can be downloaded from the internet. Many companies offer completely digital versions of their textbooks that can be accessed anytime or anywhere. Districts in about half the states, including Wyoming, have organized digital, royalty-free, high-quality, open educational resources (OER) to supplement or provide portions of the curriculum (Fletcher, Schaffhauser, & Levin 2012; Bentley, 2019). Newer curriculum materials are critical today as school systems shift to more rigorous college and career ready standards. To ensure that materials are current, nearly half the states have instituted adoption cycles in which they specify or recommend texts that are aligned to state learning standards (Education Commission of the States, 2013). Adoption cycles with state funding attached allow districts to upgrade their texts on an ongoing basis instead of allowing these expenditures to be postponed indefinitely due to lack of funding.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
Provide $190.00 per ADM for elementary, middle and high schools.	Provide $209.33 per ADM.	Provide $210.00 per ADM for elementary, middle and high schools.	$44,584

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

This analysis addresses two issues: instructional materials and library materials.

Instructional Materials

Access to standards-aligned instructional resources is critical for teachers and students. Wyoming adopted the Common Core State Standards (CCSS) in Language Arts and Mathematics in 2012 and amended the law in 2015 to evaluate and review the uniformity and quality of educational program standards not less than every nine years. However, standards do not delineate any particular teaching practice, curriculum, or assessment method. Just under half of states have instituted adoption cycles in which they specify or recommend texts aligned to state learning standards (Education Commission of States, 2013). These cycles range from five to seven years. Wyoming currently does not have textbook adoption cycle and should consider a textbook adoption cycle as a mechanism for helping districts provide students with up-to-date, relevant and reliable information aligned with a review of subject matter standards. Textbook adoption is a time consuming, labor-intensive process and requires specific expertise. Without state encouragement, these important decision processes can be delayed by districts for extended periods, and/or conducted without the level of expertise that can be brought to bear through a state level approach, to the detriment of the instructional programs and student learning.

Up-to-date textbooks and materials whether digital or print are expensive. The type and cost of instructional materials differ across elementary and secondary levels. Textbooks at the secondary level are more complex and thus more expensive. Elementary grades, on the other hand, use more workbooks, worksheets and other consumables. Both elementary and secondary levels require extensive pedagogical aides such as math manipulatives and science supplies that help teachers demonstrate or present concepts using different pedagogical approaches.

Textbook prices vary widely. At the high school level, textbooks can cost from $80 to $160. Most major textbook companies now offer electronic versions of their texts; however, contrary to popular belief, these versions can be more expensive than the paper-based texts. Some digital versions are offered with time-bound contracts, much like library database subscriptions, while others may require the purchase of the paper texts with the digital license. Most digital-only materials from standard publishers are the same price or are only marginally discounted from the paper-based version. Many publishers will offer to sell the paper-based texts with the electronic version for a 20 to 30 percent premium.

Unless Wyoming decides formally to fund a one-to-one student computer program, it is not practical to rely exclusively on electronic-based textbooks. One-to-one programs also rely on home-based internet connectivity. Until a one-to-one computer program is funded, it is necessary to continue to purchase paper-based textbooks to ensure all students have access to curriculum-appropriate resources.

Considering the move to more rigorous curriculum standards, districts should focus on purchasing curriculum and instructional materials that will assist teachers to drive student success. These new standards require more reading from information texts across all curricular subject areas. This necessitates the purchase of additional materials that have not been required prior to the implementation of these more rigorous curriculum standards Wyoming and virtually all other states have adopted. A nine-year standard adoption cycle would allow districts to purchase new and updated instructional materials for each course and subject only every nine years. While this would ensure curriculum materials coincide with the standards review by the State Board of Education, we have concluded that nine years to too long a cycle and longer than most other states. Thus, the EB model provides $170 per student an amount sufficient to allow school districts to use a six-year standard adoption cycle. We do not estimate the costs of a nine-year cycle per Wyoming law as that is too long a period of time between adoptions to ensure up-to-date curriculum materials for students.

With more rigorous curriculum standards as a backdrop, the EB Model recommendation is to create one unified support amount for instructional materials at all schools regardless of school level. Resources of $170 per student per year will support the purchase of instructional materials that are best organized to support Wyoming teaching strategies. This funding level will also allow the purchase of digital access to some textbooks if districts desire to adopt and/or experiment with digital access to textbook materials. If combined with a regular adoption cycle, this annual allocation will allow districts to focus on purchasing new curricular materials for one subject area a year, including textbooks and supplementary materials, all of which are needed to enable teachers to raise student achievement.

Principles for curriculum adoption.

It goes without saying that textbook selection substantially determines the specific curriculum a school will teach. Moreover, some curriculum and instructional programs are more effective than others. Though a complete review of curriculum programs is beyond the scope of this report, which is focused on adequate resources, it is important that districts and schools use the funds for instructional materials to select textbooks, curriculum, and instructional programs that research finds effective. In the section on tutors, we argue that structured reading programs, which specifically, systematically, and directly address phonemic awareness and phonics, have been shown by multiple researchers to be more effective than other approaches, especially for children from lower income and ELL backgrounds. Similar evidence suggests mathematics programs and instructional practices matter. Many effective schools have used textbooks that integrate problem solving with concept instruction together with an emphasis on arithmetic basics. Further, a recent study concludes that early elementary children with mathematics difficulties are best served by teachers who provide substantial direct mathematical instruction and routine practice and drill on math facts (Morgan, Farkas & Maczuga, 2015). Our conclusion is that some instructional materials are more effective with some or all students than others, and districts and schools should select specific programs only after careful analysis and review to ensure that funds for instructional materials are spent wisely and address the specific needs of their students.

Reading is a special issue. There is nearly universal agreement that reading is key to learning in *all* subject areas. In recent years there has been an emerging trend to enact state and district reading programs. In selecting instructional materials, it is critically important that districts adopt elementary reading materials that allow teachers to implement a *science-based* reading program (see for example, Moats, 2020). Despite broad agreement on the recommendations of the 2000 National Reading Panel (National Institute of Child Health and Human Development, 2000), several recent studies and surveys have found that science-based reading practices are not evident in the bulk of the nation's classrooms. In a specific study of whether teachers were implementing science-based reading practices in Tier 1 instruction, Kretlow and Helf (2013) found that most teachers were not using those practices.

Goldstein (2020) also noted the resurgence of interest in improving reading scores via the "science of reading." She argued that lagging reading achievement on the National Assessment of Education Progress (NAEP) – only a third of America's children are proficient in reading – and new attention to the science of reading has led to a resurgence of attention to phonics and phonemic awareness.[20] She further argued:

> The "science of reading" stands in contrast to the "balanced literacy" theory that many teachers are exposed to in schools of education. That theory holds that students can learn to read through exposure to a wide range of books that appeal to them, without too much emphasis on technically complex texts or sounding out words.
>
> Eye-tracking studies and brain scans now show that the opposite is true, according to many scientists. Learning to read, they say, is the work of deliberately practicing how to quickly connect the letters on the page to the sounds we hear each day.
>
> The evidence "is about as close to conclusive as research on complex human behavior can get," writes Mark Seidenberg, a cognitive neuroscientist and reading expert at the University of Wisconsin, Madison…."

Phonics boosters say they now know more about what works, and that phonics alone isn't the answer. Alongside bigger doses of sounding out, they want struggling students to grapple with more advanced books, so they won't get stuck in a cycle of low expectations and boredom. Some schools are devoting more time to social studies and science, subjects that help build vocabulary and knowledge in ways that can make students stronger readers (Goldstein, 2020).

Goldstein also cited NAEP results that found during the past several years only two states had boosted third grade reading scores on recent NAEP assessments – Mississippi and Washington – and both states had adopted a statewide approach to systemically teaching phonics and phonemic awareness as well as the other elements of the science of reading.

In a 2019 survey conducted by Education Week's Research Center, Sawchuk (2019) found that most teachers were not using science-based reading practices. Sawchuk further found that the non-science-based practices teachers used were often deployed under the banner of "balanced literacy" *as well as* recommended by mentors, coaches, professional groups and teacher training institutions.[21] Lucy Calkins, one of the country's leading reading experts who supported balanced literacy, has recently admitted that such an approach to reading needs to be changed and that successful reading programs must systematically include phonics and phonemic awareness, particularly at the early grades (Education Week, 2020).

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[20] The same is true for 8th grade students in Wyoming, although 41 percent of Wyoming 4th grades students perform at or above the NAEP proficient level.

[21] Balanced Literacy has become the modern way for many former proponents of the "whole language" approach to acknowledge the importance of phonics and phonemic awareness, but too often "balanced literacy" in practice provides only a cursory and unsystematic use of instruction in phonemic awareness and phonics.

Though we have not conducted a similar survey in Wyoming, there is hope that these practices in other parts of the country may not reflect the reading practices of the state's elementary teachers. As documented by the National Council on Teacher Quality, the University of Wyoming's College of Education curriculum, unlike many across the country, *is* based on the findings and recommendations of the National Reading Panel Report of 2000, and the What Works Clearing House. The College of Education's Literacy Center seeks to get those practices implemented in all elementary school classrooms.

Given the importance of ensuring that all students read proficiently by the third grade, which. is also the goal of Wyoming's K-3 Literacy Initiative, it is important to know not only the core elements of what comprises a science-based reading program, but also some specific classroom organizational and teacher instructional issues needed to implement the program. *Educational Leadership* (2020), a professional journal of the Association for Supervision and Curriculum Development, recently published an issue that summarized this science, making this knowledge easily accessed by all educators. In that issue, Benjamin Riley (2020) provided an excellent summary of the science of reading:

> There are certain things we learn "naturally," that is, as the result of millions of years of human evolution. The most obvious example is understanding spoken language. Absent cognitive or hearing impairment, virtually all human children will learn what words mean simply by being around and listening to other humans.
>
> Reading is another matter entirely. …it is not accurate to call reading, and the process by which we learn to read, "natural." It's a modern human innovation—arguably the most powerful in our species' history.
>
> Virtually all children can learn to read through formal education (again, absent some cognitive or physical impairment). What's more, the process by which humans learn to read has been well-researched, to the point that we can describe our knowledge of this process as a science. Here are just a few reading-science principles that aren't in dispute among English-language literacy experts:
>
> - Children can learn to understand how written letters relate to sounds–to decode text–through explicit phonics instruction (Castles, Rastle & Nation, 2018). They should receive explicit instruction that teaches the sounds that letters and combinations of letters represent, and the relationships of spelling patterns and pronunciations. Teachers need to be explicit in such instructing; this isn't the place for being a "guide on the side."
>
> - The key factor in helping young children transition from decoding text to becoming fluent readers is lots of reading practice with varied texts (Stanovich & West, 1989). Teachers should make books and other texts readily available in different parts of the classroom. But "independent reading" shouldn't supplant direct reading instruction.
>
> - Explicit strategies designed to improve reading comprehension cannot, on their own, compensate for lack of vocabulary or content knowledge on a particular subject. It's fine

> for teachers to teach a few comprehension strategies (like making predictions) to students, but they shouldn't overdo it.

Schmoker (2019), moreover, cautions against one classroom organizational strategy that dominates elementary reading instruction: multiple, reading level-based student groups. Even though literacy instruction usually consumes a large portion of the instructional day for elementary students, Schmoker finds that literacy instruction rarely includes the most essential elements of science-based reading instruction – whole class direct instruction, even when educators agree with those practices! The culprit: multiple ability leveled reading groups rather than whole class, direct instruction.

Schmoker (2019), who is one of the country's top professional development consultants, says, "The most successful K-3 teachers … use small groups sparingly! That is because their *whole class instruction* consistently incorporates the proven effective, but rarely used, elements of successful teaching. They master simple techniques for ensuring that all students are attentive, and conduct frequent, ongoing assessments of the class's progress through the lesson and reteach accordingly." Research shows that whole group instruction is almost always more effective than ability-based, small group instruction, as in this format all students receive many more minutes of direct reading instruction.

A 2018 meta-analysis of a half century's research on the impact of whole-class "direct instruction," Stockard, et al. (2018) found significant positive effects on: 1) reading, language, spelling, mathematics and other academic subjects, 2) ability measures, 3) affective outcomes, and, 4) teacher and parent views. The results showed that such impacts were maintained over time *and* were even greater when students had more exposure to such direct instructional programs.

These concepts and practices have penetrated some districts, schools and classrooms, at least to some degree. In the *Educational Leadership* issue, Myracle (2020), a newly appointed district director of instruction, argued there "is little evidence to support the effectiveness of one of the most pervasive English language arts approaches—grouping students based on reading level for Tier-1 reading instruction … Instead of grouping students by reading levels, some experts believe that challenging all students [whole group direct instruction] with grade-level texts, with scaffolding as necessary, best serves reading outcomes." Myracle references the reading blog of Timothy Shannon, one of the country's top experts on how to teach reading, as making the same points (https://shanahanonliteracy.com/blog).

Finally, Gewertz (2019) profiled an Ohio school district that before the Common Core Reading Standards allowed each elementary school to deploy its own reading program, with no districtwide curriculum. The district had unacceptably low student performance. The district viewed the new, more rigorous reading standards as requiring a new district approach to reading. The district revised reading instruction to reflect the science of reading: structured phonics instruction paired with helping students build content knowledge and strong vocabularies, which together help children read better. Teachers now use a rich mix of whole class instruction emphasizing phonics and phonemic awareness, and some group work. Further, the district now uses more direct instructional techniques and more structured reading materials, including

Foundations by Wilson Language Training. The new strategies, including the emphasis on phonics and phonemic awareness, generally were not taught to the teachers in their teacher training programs. As expected, under the new approach to reading, the district's state reading scores rose sharply, and teachers claimed that elementary students now do not get stuck on new words but attack them in newly taught ways.

All of this research emphasizes the important point that districts and schools must use instructional resources for curriculum materials that are effective. And since reading fluency is the foundation for learning all subject areas, it is critically important for districts to adopt reading materials and programs that embody all that is known about the science of reading. Though these comments might seem obvious to many, the research shows that too often schools do not use science-based curriculum or instructional processes. Therefore, we underscore the importance of doing so for reading, for which the science of teaching reading is comprehensive and detailed.

To reinforce this approach for the important subject of reading, the state could do the following:

- Reinforce the current state K-3 reading program
- Require districts and schools to adopt a science-based reading program
- Create fully funded categorical programs for:
    - Instructional facilitators
    - Tutors/Tier 2 Interventions
    - Extended day and summer school programs.

Library Materials

The NCES reports the average national expenditure for library materials in SY 2011-12 was $16 per pupil, excluding library salaries (NCES, 2015). Over 90% of the $16 was spent on book titles and the remainder on other resources such as subscription databases. The use of electronic databases has declined in recent years as many instructional resources are offered free to the public on the Web.

Electronic database services allow librarians to strengthen print collections and at the same time ensure students have access to electronic data bases that provide more reliable data and information than they might identify only on easily available websites. Electronic data base services vary in price and scope and are usually charged to school districts on an annual per student basis. Depending on the content of these databases, costs can range from $3 to $10 per database per year per student.

Inflating these two cost estimates – library materials and data bases – to adequately meet the needs of school libraries, we recommend funding of $40 per student to pay for library texts and electronic services. Adding this $40 per student for library materials to the $170 per student amount for instructional materials brings the 2020 EB Model recommendation to $210 per student for instructional and library materials.

Resource Use Analysis

The WDE's CRERW report combined expenditures for instructional materials and technology into one category for reporting purposes. In SY 2013-14, the Legislative Model generated a total of $58.9 million and the districts spent $49.0 million, or $9.9 million less than allocated. This represents 83.2 percent of the funds generated by the Legislative Model for technology and instructional supplies. It is not possible to determine what proportion of this went for technology specific equipment and supplies and what proportion went for textbooks and other supplies.

This pattern was true until 2017-18, the first year following the Legislature's decision to reduce the per pupil funding level down from the Legislative Model to the level recommended by the EB model. As a result, model allocations for technology and instructional materials dropped by about $20 million. In 2017-18 districts spent $51.8 million dollars on instructional materials and technology compared to the $41.5 million dollars allocated by the funding model, about 25 percent more than the model resourced. The pattern continued in 2018-19 with districts spending $51.7 million on instructional materials and technology compared to the model allocation of $40.8 million, or almost 27 percent more than the model allocated. It seems likely this pattern continued into 2019-20 as we would anticipate districts had to increase spending on both technology and digital curriculum materials due to school shut-downs caused by the COVID 19 pandemic.

PJ Panel Comments on Instructional Materials

Overall, most of the PJ panelists stated that the Legislative Model funding for instructional materials was adequate – this is supported by the district underspending of about $10 million dollars a year until the reductions in instructional materials enacted in recent years. Several panelists agreed that there is a perception that not all of the model generated resources are allocated to instructional materials.

Most panelists recognized that the funding was designed to allow for one textbook adoption a year and that it provided enough money to purchase instructional materials for that subject. District adoption cycles varied from seven to ten years, although one participant stated that her district had a five-year adoption cycle.

One of the major issues that emerged at the PJ panels was the cost of digital instructional materials. Panelists described the dilemma as follows: If they choose to buy traditional textbooks, they have access to digital versions of the book at no additional cost, but the digital versions are not updated. If they select digital only versions of textbooks, the cost either includes an initial cost plus relatively low annual licensing fees, or alternatively, consistent licensing fees – the difference seems to be largely publisher dependent. The critical issue, panelists argued, was that with either approach to licensing fees, the digital only version might end up costing more over six years than the purchase of the textbook. The advantage is that the digital version is also updated annually. Some panelists argued that the instructional materials amount in the Legislative Model would likely be inadequate under a licensing approach to digital materials, although others argued that funding for instructional materials was adequate to purchase digital materials under a licensing agreement.

The cost of consumables was a concern to some panelists who worried that there was not enough money to provide the consumables needed for many curriculum programs. On the other hand, some of the panelists stated that their districts included consumables in the costs of the adoption at each cycle, and one pointed out that with technology, the cost of consumables goes away (see section on technology for the cost of computers). One district indicated they spent their entire instructional materials allocation on materials and supplies and the costs of textbook adoptions was on top of that.

There was some discussion about the costs of library materials. There was substantial variation as to whether or not the model provides adequate resources (they would be part of the $210 per ADM allocation). There was appreciation expressed for the fact that the state now picks up the cost of most on-line data bases, relieving districts of those costs.

Overall, it appeared that the model provides adequate resources for instructional materials and adoption cycles, although smaller districts worried about dis-economies of scale and feared that they did not get enough money to purchase both textbooks and enough other books to fully stock a "leveled library," a tool many felt was an important component of reading programs.

2020 Evidence-Based recommendation

Provide an amount for instructional materials and Library materials equal to $210 per ADM for SY 2021-22.

18. Short-cycle/Interim Assessments

All states, including Wyoming, administer summative assessments in the spring of each school year (Education Commission of the States, 2020). These assessments indicate the level of student performance in select core subjects, usually English language arts, mathematics, and science. Summative assessments – necessary tools to help schools make high-level decisions about the school improvement process – exist alongside a series of other types of assessment data that serve other, more targeted purposes. The new Wyoming Test of Proficiency and Progress (WY-TOPP) system, which includes summative and interim and modular assessments, was designed to provide districts, schools and teachers with the full complement of assessment data needed to engage in data-based decision-making to foster continuous improvement in student performance.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
Provide $25 per ADM and not subject to an ECA.	No funding.	Provide $25 per ADM and not subject to an ECA.	$2,311,089

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Data-based decision making has become a core and important element in school reform and improvement over the past two decades. It began with the seminal work of Black and William (1998) on how teachers can use ongoing data on student performance to frame and reform instructional practice, and continued with current best practice on how professional learning communities use student data to improve teaching and learning (DuFour, 2015; DuFour, et al., 2010; Hamilton, et al., 2009; Steiny, 2009). The goal is to have teachers use student performance data to inform their instructional practice, identify students who need interventions, progress monitor the effectiveness of those interventions and improve overall student performance (Boudett, City & Murnane, 2007). As a result, data-based decision making has become a central element of schools moving the student achievement needle (Odden, 2009, 2012).

Research on data-based decision making has documented significant, positive impacts on student learning. For example, Marsh, McCombs and Martorell (2010) showed how data-driven decision making in combination with instructional coaches produced improvements in teaching practice as well as student achievement. Further, a 2011 study of such efforts using a randomized controlled trial showed that engaging in data-based decision making using interim assessment data improved student achievement in both mathematics and reading (Carlson, Borman & Robinson, 2011).

In light of the high impact of data-based decision making, new research has appeared to help teachers, schools, and districts design effective structures for both facilitating and enhancing the effects of data-based decision making. Hamilton et al. (2009) summarize the research on, and structures of, effective data-based decision-making mechanisms. Datnow and Park (2014) produced a handbook on how to structure and implement high impact data-based decision-making processes. Datnow and Park (2015) followed that book with a more succinct overview of the such systems in *Educational Leadership*. The late Richard DuFour (2015), one of the country's experts of teacher collaborative work using student data, provided a synopsis of effective structures and processes for engaging in effective data-based decision making. All of these rely on access to comprehensive interim and short-cycle assessment data.

To engage in data-based decision making, schools typically use four types of assessment data:

- State summative assessments
- Benchmark assessments
- Short-cycle assessments, and
- Formative assessments.

Schools often start their improvement processes by analyzing the summative assessment data. Analyses of the state accountability (end-of-the-year summative assessments) tests provide a good beginning for schools to redesign their overall educational program. But, in order to plan, implement and monitor progress toward higher levels of performance and achieve success in reducing demographics-related achievement gaps, schools need additional assessment data.

One of those additional assessment tools is generally called a "benchmark" assessment. Benchmark assessments are closely aligned with the state's summative testing system and are usually administered in the fall and winter. Fall assessments indicate where students start the year in terms of performance on core state content areas. Winter assessment results show progress half-way through the year toward proficiency, which then is measured by the end-of-the-year summative assessment. Benchmark assessments give feedback on each semester of instruction and are often used to determine which students need interventions or extra help.

A third assessment tool is generally referred to as a "short-cycle" or "interim" assessment. These interim assessments are often computer adaptive tests that are given in shorter cycles – every three to five weeks. These assessments most often are used to progress monitor the effectiveness of interventions for students, including those with IEPs. Short-cycle assessments also provide the data teachers use to engage in collaborative, student-data-based decision making. Short-cycle assessments also generally include screeners, or micro-diagnostic tools that identify student knowledge with respect to specific reading and math skills. Short-cycle interim assessments are also frequently linked to a "learning progression" of specific content areas, with test results providing teachers with micro-information on how to lesson plan for specific curriculum units, deliver instruction with strategies tailored to the exact learning status of the students in their own classrooms, and gauge individual student progress toward proficiency in the standard being covered in the unit.

A fourth assessment tool, called a "formative" assessment, is administered over even shorter time periods, usually several times during the teaching of a curriculum unit – sometimes even daily. Often, teachers themselves create formative assessments. Used in addition to the previous two assessment tools, formative assessments provide teachers with information to help identify additional student learning needs so teachers can improve their instruction. All of these additional assessment tools are used by schools that are successful in moving the student achievement needle.

The new WY-TOPP testing system in Wyoming has some but not all of these elements.[22] WY-TOPP has a spring summative assessment component. WY-TOPP further includes fall and winter assessments that fit the description of benchmarks assessments (as defined above), though Wyoming terms them "interim" assessments. In past years, many Wyoming districts used the NWEA MAP computer-adaptive assessment system for benchmark assessments. Wyoming districts can now use the state's "interim" assessments for these benchmark assessment data. Benchmark assessment data, however, cannot be used for progress monitoring in an RTI program of extra help for struggling students.

In addition, WY-TOPP includes modular assessments. This component of WY-TOPP is roughly similar to the short-cycle, interim assessments described above but are "fixed form assessments divided by topic to measure subsets of the standards."[23] These modular assessments provide useful information tied to specific Wyoming standards. However, in their current state, their ability to serve as comprehensive diagnostic or progress monitoring tools is constrained. The constraints stem from some key characteristics of the assessments. First, there are only two

[22] See WDE: https://edu.wyoming.gov/educators/state-assessment/
[23] See https://edu.wyoming.gov/downloads/communications/2019/WY-TOPP-Teacher-FAQ.pdf, p. 1.

versions of the modular assessments for any one topic, and sometimes the questions in the modular assessments are the same as those in the WY-TOPP interim assessments. Moreover, the modular assessments contain only a small number of items. Limitations in the number of items available restrict teachers' ability to use them to develop a finely-grained understanding of students' progression toward mastery of standards as well as their ability to monitor the effectiveness of interventions for struggling students (including those with IEPs), prevents teachers from gaining micro-information on student learning, and limits the tests' ability to inform teachers' instruction. Furthermore, these tools do not include reading or math screeners, which teachers say are a core element of what they need to tailor instruction to the specific needs of individual students.

Finally, WY-TOPP has begun the process of helping teachers create formative assessments; the future will show how this element plays out in practice.

Our conclusion is that while the WY-TOPP system is fairly comprehensive, it does not include a robust short-cycle, computer-adaptive assessment element, which our research on case study schools in Wyoming as well as other states shows is a critical element of schools that produce large improvements in student learning. Thus, we have concluded that Wyoming teachers still need a small amount of funds so they can access short-cycle, computer-adaptive, assessments and use the data both for progress monitoring of students with IEPs and other data-based decision-making activities. The costs of these powerful assessments are modest. The EB Model generally provides $25 per pupil for such assessment capabilities. This capacity enables teachers to obtain interim assessments for PLCs, screeners, progress monitoring, and/or overall instructional improvement. These assessments all can be aligned to Wyoming's curriculum standards and with the elements of WY-TOPP would provide teachers with the full range of assessment data they need to improve student performance.

Examples of "short-cycle" assessments include STAR Enterprise from Renaissance Learning (www.renaissance.com), which is in an online, adaptive system that provides data in reading/literacy and mathematics for grades preK-12. Many Reading First schools as well as many schools we have studied (Odden & Archibald, 2009; Odden, 2009) use the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessments (http://dibels.uoregon.edu). Fast Bridge, used in Natrona and other Wyoming districts, is a third example of a short-cycle assessment. The NWEA MAP program, used in the past by many Wyoming districts as benchmark assessments, has also been expanded to provide short-cycle assessment data. All four of these examples include screeners for both reading and mathematics. The Galileo Assessment system as well as the Diagnostic Reading Assessment (DRA) are additional examples of these needed assessments.

Resource Use Analysis[24]

Until 2018-19, the Legislative Model provided each district with $37.70 per ADM for assessment costs compared to the $25 per pupil in the EB Model. In SY 2013-14, only 35 of the 48 districts reported expenditures in this category. We could not determine how assessment expenditures were recorded in the remaining 13 districts, or if they had assessment expenditures

[24] Data taken from CRERW sfp_crerw_appendix_b.

that year. Of the 35 districts reporting expenditures, only six spent more than allocated, while the remaining 29 spent less than allocated. In SY 2013-14, total model allocations for all 48 districts amounted to $3,436,736. Among the 35 districts that reported assessment expenditures, total assessment expenditures amounted to $2,028,653. This is $1,408,082 less than that provided by the Legislative Model for all districts. If the other 13 districts had expenditures for assessment, they were reported in another category.

By 2017-18, only seven districts did not report any expenditures for assessment. As in 2013-14, six districts spent more than allocated for assessment, while the remaining 35 of the 41 districts reporting expenditures indicated lower expenditures than their model allocation. Overall, in 2017-18, districts were allocated $2,349,146 for assessment. The 41 districts reporting expenditures for assessment that year spent $1,278,946, which was $1,070,200, less than all 48 districts generated for assessment through the Legislative Model that year. In 2018-19, 40 districts continued to report expenditures for assessment totaling $1,074,476, despite receiving no funding for assessment through the Legislative Model.

PJ Panel Comments on Short Cycle Assessments

PJ Panelist views of the WY_TOPP were quite consistent. They felt it offered a good summative assessment at the end of the school year but were concerned that the interim assessments were not good predictors of student performance on the summative assessments because, several panelists alleged, the rigor of the interim assessments was less than that of the summative assessments. Moreover, panelists felt that at this point the modular assessments were not sufficient for short-cycle purposes, and as a result, schools were supplementing them with other testing platforms for short-cycle assessments. Most, if not all, districts relied on purchased assessment materials from other vendors. The most common assessments used by the districts were Fast Bridge, DIBELS, Galileo and NWEA MAP.

Another example of concerns about WY-TOPP is 2019 HB 0297. Wyoming law (W.S. 21-3-401) requires dyslexia screening in early grades with a list of things that must be assessed. WY-TOPP only does comprehension, and at a minimal level. As a result, districts have to find alternatives to meet this dyslexia screening requirement. On panelist argued that this also has a high human cost as it takes time from someone to do the screening (opportunity costs). Moreover, one PJ Panelist who was an assessment director in her district, stated that it was unlikely these costs could be charged to special education because the screening is required for all students.

One PJ panelist stated that in the past, instructional facilitators or coaches played a role in helping with short term assessments, but as those positions are cut, teachers don’t have the support or staff to meet these needs.

In sum, WY-TOPP has over promised and under delivered; it seems that the rigor of the Interim and Module assessments are less than the rigor for the summative; Performance on the interims and modules do not predict performance on Summative assessments. There are no diagnostics for K-2 reading and phonics and phonemic awareness. And many districts continue to purchase other, mainly computer adaptive, short cycle assessments.

2020 Evidence-Based recommendation

Provide $25 per ADM for short-cycle assessments and not subject to an ECA. This will allow districts to continue short cycle assessments until such time as WY-TOPP has more modules to meet this need.

19. Technology and Equipment

Schools have committed to embed technology into instructional programs and school management strategies. Today, states and districts expect students to be technologically proficient when they graduate from high school. Virtual schools, online tutorials, blended instructional strategies, flipped classrooms, and electronic collaborative environments have changed the face of how students are educated (Whitmire, 2014). Infusing technology and online teaching into traditional schools can provide individualized learning and move the teacher into the role of an instructional coach (see Odden, 2012). Research shows technology engages students and can be effective in schools with high concentrations of lower income and minority students (U.S. Department of Education, 2017; Whitmire, 2014). The advent of the COVID-19 pandemic has further emphasized the critical importance technology plays in the education of students.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
Provide an amount equal to $250.00 per ADM not subject to an ECA adjustment in future years .	Provide an amount equal to $250.00 per ADM not subject to an ECA adjustment in future years.	For a three-to-one student-to-computer ratio provide an amount equal to $250.00 per ADM not subject to an ECA in future years. For a one-to-one student-to-computer ratio provide an amount equal to $350.00 not subject to an ECA in future years. This option requires a policy decision by the state.	No Difference at $250 per ADM $9,244,391 at $350 per ADM

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Infusing technology into the school curriculum has associated costs for computer hardware, networking equipment, software, training, and personnel associated with maintenance and repair. If devices and software are not maintained and updated, teachers and students can become disengaged by “dated” devices and learning opportunities can be lost.

Technology has both direct and indirect costs. This *Technology and Equipment* section of the EB recommendations focuses on direct costs such as hardware, software, and personnel costs for repairing and maintaining infrastructure and devices. Other EB Model elements incorporate the indirect cost of technology including professional development, loss of time for self-support and casual learning, additional hours required for curriculum development, and school computer technicians to help with keeping school-based technology in working order.

Wyoming schools have a variety of computers of varying ages that are connected to school networks and the internet. Schools are wired and most are adding Wi-Fi capabilities and increasing bandwidth. The EB recommendation assumes major capital expenses such as bringing high speed internet to the school site and wiring the school have been or will be paid for with school capital construction funds or through the state’s unified network overseen by the Department of Enterprise Technology Services.[25] Nevertheless, the EB recommendation does include funds to upgrade and maintain network switchgear and central servers at the campus level.

The EB recommendation for computers and related equipment has held constant at $250 per student for many years. This has been possible because as technology advances, the cost of devices and other equipment drops, even though technology and software needs expand. This analysis estimates four categories of technology costs totaling $250 per student (Odden, 2012). The amounts by category should be considered flexible, as districts and schools need to allocate dollars to their highest technology priority outlined in state and district technology plans.

The per-student costs for each of the four subcategories have been:

- Computer hardware: $74
- Operating systems, productivity and non-instructional software: $69
- Network equipment, printers and copiers: $55
- Instructional software and additional classroom hardware: $52

This per student figure is sufficient for schools to purchase, upgrade and maintain computers, servers, operating systems and productivity software, network equipment, and student administrative system and financial systems software, as well as other equipment such as copiers. System software packages vary dramatically in price; the figure recommended would cover medium priced student administrative and financial systems software packages.

[25] http://ets.wyo.gov/inside-ets/unified-network

The $250 per student figure, updated for the 2020 recalibration, allows a school to have one computer for every three students with additional computers for teachers, the principal, and other key school-level staff.

Over the last few years, computer makers have developed alternative products, such as Chromebooks and tablet computers that have a lower entry price point of about $300 per unit compared to the $500 to $800 cost for laptop or desktop computers. These lower-cost devices are designed with limited hardware specifications that still allow students to access cloud-based internet applications effectively but do not require extensive device computing power or memory. For school districts that value increasing student access to technology, purchase of these lower-cost devices provides an opportunity to strategically lower student-to-computer ratios.

Though Chromebooks use a different operating system than has typically been used in the educational environment, most instructional and interactive testing software is browser-based and housed in the cloud, making these software packages agnostic to operating systems. Additional software is being continually developed for these platforms as they become more commonly used in the educational space. One limiting issue of an internet device like a Chromebook is that if there is no internet connectivity available, then cloud-based productivity or other software loses functionality. This can be a disadvantage in a one-to-one computer program in which some students lack home internet access. But as more software applications move to the cloud, this problem is not limited to Chromebooks or tablets.

As the student-to-computer ratio decreases there is opportunity for districts to explore one-to-one student-to-computer ratios at key grade levels or schoolwide. The more exposure students have to computer devices the more accustomed and proficient they become at using them. With the growing use of computers for high stakes testing, it is essential that students are able to comfortably use computers to demonstrate their knowledge. If students have not had sufficient practice with computers in a testing environment, computerized testing can become a barrier to successfully assessing student achievement. If students cannot comfortably type, text responses become more a test of “hunt and peck” skills than a reflection of the student’s ability to respond to a prompt. As Wyoming continues to move more testing and resources online, districts will need to increase the number of devices they have and expand their internet bandwidth to accommodate these activities.

Educational application providers continue to migrate their products from local school and school district servers to the cloud while virtual classroom portals let students and parents track student assignments and achievement from anywhere. The result of this “move to the internet” emphasizes the need for schools to provide students with a technology device that will extend the classroom into the home.

In considering all of the factors described above, a district that adopts a mix of standard and low-cost units that relies more heavily on lower cost, cloud-based approaches will be able to reduce the average cost of a computer unit. Despite this drop in average cost, the EB Model recommendation remains at $74 per student for computer hardware, recognizing that introducing lower priced units will allow districts to move closer to a one-to-one student-to-computer ratio and improve refresh rates for all units. Variance in the types of computers students use will also better prepare students for the workplace.

In the past, for more expensive computers, the EB Model has recommended districts purchase 24-hour maintenance plans to eliminate the need for school or district personnel to fix computers. For example, a school or district can purchase a maintenance agreement from a number of computer manufacturers that guarantees computer repair on the next business day. Many private sector companies that offer such service often take a new computer with them, leave it, and take the broken computer to fix. On the other hand, when districts analyze the cost of warranty programs for Chromebooks or similar low-cost hardware, they may find it is more practical to replace broken machines than to pay for extended warranties.

As the number of computers in schools increases, it becomes more impractical to hard-wire connections in classrooms or other instructional spaces. Wireless access points within the school site create an instructional environment on campus in which controlled internet access is available anytime or anywhere. Depending on campus configuration, it is possible to serve a small group of wireless computers with just a few wireless access points. However, as the number of computers being simultaneously used increases, additional access points must be added. The original EB Model recommendation for technology and equipment included modest funds to complete small on-campus infrastructure improvements. It is still unclear whether 5G equipment will be able to be used practically in the school setting unless to provide a broadband access pipe to the school site which can then be redistributed on campus through wireless access points or if it will provide access to students' homes that were previously in inaccessible areas.

The 2020 EB Model recommendation for technology remains at $250 unless the state decides to move to a one-to-one ratio. Additionally, the EB model still recommends that this element not be subject to the ECA in the future. As technology specifications advance, the price of what were premium technological features decreases and the relative price for computer units stays fairly constant. In this process, yesterday's most advanced feature become today's common specification. The same is true for network equipment. As network technology improves, price points for many technologies have remained fairly constant even as capacity increases. For example, as the need for bandwidth has jumped, the older network switches with speeds of 100 megabits have been replaced with one gigabit or even 10 gigabit switches that cost the same as a 100-megabit switch years ago. If Wyoming continues to fund school-based technology and equipment at $250 per ADM, districts will be able to gradually upgrade necessary network equipment within their campuses and to lower their student-to-computer ratios using a mixture of traditional and new devices.

Student-to-Computer Ratio

In a three-to-one student-to-computer ratio there are three students to every one computer available to students on the campus. These computers can be in classroom mini-labs, the library, or computer carts. In a one-to-one student to computer ratio, each student has a device assigned to them. The student takes that device home and to school each day. In both of these scenarios, districts need to factor in the purchase of not only computers for students, but also computers for teachers, offices staff, or other learning stations whether in the classroom, library, or other educational spaces. This increases the number of computers needed beyond the number of students by a factor of approximately 20 percent. For instance, with a one-to-one ratio, in a prototypical elementary school of 288 students, the school would need 288 devices for students and an additional 58 devices (20 percent) to be used in other school areas, e.g., 20 for faculty, 10 for the office and office staff, and 28 for other school learning areas (or mobile carts) for days when students are not required to bring their laptops to school. In the same school of 288 students with three-to-one ratio, there would only be a need for 96 student computers, however, the extra 20 percent factor of computers for administrative and other purposes would remain the same as the one-to-one ratio (58 administrative and other computers) because that number is calculated based on the number of students, not the number of student computers.

Option 1: Achieving a Three-to-One Student-to-Computer Ratio

A three-to-one, student-to-computer ratio creates a learning environment that has classrooms with small banks of desktop or laptop computers for student research, individual classwork, reference or group work. Carts with class sets of laptops are available for teacher use when needed and the library/media center doubles as a computer lab. Tablet computers are also available for student checkout to create projects and or complete other coursework. Desktop and laboratory computers are more powerful and can complete specialized functions. The refresh cycle on classroom and computer laboratories is four years because the computers are not moved frequently or at all. These stationary computers are a higher average price because of high-resolution, larger screens used for research and group work. Outside of school hours, those students who have computers and internet access at home can still access assignments, course materials, and achievement data at any time; those who do not have a computer and internet access in the home can access these mentioned resources and others before and after school, or at a local public library.

Table 3.19.1 indicates the number of computers needed for a three-to-one ratio for both the prototypical elementary and secondary school. The numbers are 154 for the prototypical elementary school and 168 for the prototypical secondary school (315 ADM).

Table 3.19.1 Number of Computers Needed in a Three-to-One Student-to-Computer Ratio

Prototypical School	Student Computers Needed (# of students divided by 3)	Site Computers Needed (20% of the # students)	Total Computers Needed
Elementary – 288 Students	96	58	154
Secondary – 315 Students	105	63	168

Table 3.19.2 shows the total funds produced by $74 per pupil per year over a four-year time period for prototypical elementary and secondary schools and shows how these funds can be applied to the purchase of the number of computers identified in Table 3.19.1. The table shows that the $74 per pupil figure (for computer hardware) produces $85,248 over four years for an elementary school and $93,240 for a secondary school. At an average cost of $550 per computer the second column shows that the purchase of the identified number of computers over 4 years

would total $84,700 in an elementary school and $92,400 in a secondary school. In both cases there are adequate funds to purchase the needed computers with less than $1,000 surplus. The $550 average cost assumes a mixture of higher-priced computers with some lower-cost Chromebooks. Higher-cost enterprise-grade computers and laptops that are Windows or Apple based still cost between $500 to $1,200.

Table 3.19.2 Per-Student Computer Funds Over Four Years Compared to Costs of Computers with a Four-Year Replacement Cycle

Prototypical School	Dollars Generated by students @ $74 per student per year over four years	Total Cost of All Computers Needed on four-year cycle @ $550 per computer/device	Difference
	(288 x $74 x 4)	(154 x $550)	
Elementary – 288 Students	$85,248	$84,700	$548
	(315 x $74 x 4)	(168 x $550)	
Secondary – 315 Students	$93,240	$92,400	$840

In a three-to-one student-to-computer ratio, computers are more expensive, built for the enterprise. Enterprise, or business grade, equipment is designed with stronger materials to guard against wear-and-tear that occurs in the normal course of usage. It is a machine that has advanced specifications to ensure its relevance and usefulness over the four years. The computer is based on standardized parts from the same manufacturer. This type of design provides a “constant” form factor with hardware components requiring only one set of common software drivers. This consistent design simplifies maintenance allowing a machine to be re-imaged in a few hours instead of requiring a technician to search for unique hardware drivers, recreate network settings, install print drivers and perform other such time-consuming tasks. The initial specifications and the price of business-grade machines is higher from initial purchase; the manufacturer maintains these specifications over various years for ease of customer maintenance. This is contrasted to lower-cost Chromebooks that have hardware specifications that may change with each purchase, as their main purpose is to provide affordable access to the internet and cloud applications.

Option 2: One-to-One Computing

One-to-one computing, meaning each student is issued a device to use at school and home, has been implemented successfully in districts across the country. Maine, which began a program of providing every student with a computer, has one of the longest running implementations of a one-to-one program. With the advent of the Covid-19 pandemic, there has been a concerted effort across the United States and in Wyoming to find ways to get all students devices that can access on-line instruction. How systematically this has been done, how successful schools have been in reaching this goal, and the impact on student learning is not yet known. It does seem clear that more students than ever before will have access to individual computers and in the long run, one-to-one programs will likely be more common. Hence, we provide here an estimate of the costs required for a one-to-one program should Wyoming policy makers determine this is the best way to educate children in the future.

A one-to-one, student-to-computer ratio creates a learning environment in which each student has a computer, usually a Chromebook or tablet. If required by an assignment, every student can access electronic curriculum and work individually in their classroom or at home. No school computer laboratory is necessary because each classroom or the library can become an instant computer laboratory. One class set of laptops is available on carts for last minute projects when a teacher has not asked students to bring computers to school. Over 80 percent of the computers are low-cost Chromebooks or tablets that have a shorter, three-year refresh cycle. This is because these computers are constantly being transported to and from school. The home becomes an extension of the classroom for all students. Teachers know they can assign work that requires digital resources and tools because they know each student has a computer available at any time [this assumes an internet connection in the home]. Students can turn in work digitally from home or school. Students have access to assignments, course materials, and achievement data from school or their home.

Table 3.19.3 shows the number of computers needed for a one-to-one ratio for the prototypical elementary and secondary school, 346 and 378 respectively assuming that the number of computers needed beyond the number of students is the same as in the three-to-one model. Table 3.19.4 shows that this number of computers (at $350 each – see below) could be purchased over a three-year cycle with a hardware allocation of $141 per pupil, compared to the $74 per pupil for the three-to-one ratio approach.

Table 3.19.3 Number of Computers Needed in a One-to-One Student-to-Computer Ratio

Prototypical School	Student Computers Needed Equals Number of Students	Site Computers Needed (20% of the # students)	Total Computers Needed
Elementary – 288 Students	288	58	346
Secondary – 315 Students	315	63	378

Table 3.19.4 Per-Student Computer Funds Over Three Years Compared to Costs of Computers with a Three-Year Replacement Cycle

Prototypical School	Dollars Generated by Students @ $141 Per Student Per Year Over Three Years	Cost of Total Computers Needed on Three-Year Cycle @ $350 Per Computer/Device	Difference
	(288 x $141 x 3)	(346 x $350)	
Elementary – 288 Students	$121,824	$121,100	$724
	(315 x $141 x 3)	(378 x $350)	
Secondary – 315 Students	$133,245	$132,300	$945

Because of the improvement in Chromebook platforms and software applications that run seamlessly from the cloud on any major browser, more districts and schools have been able to afford a one-to-one program, either at certain grade levels, or at certain schools. Chromebooks and Android-based tablets can be purchased for around $300. If an extra $50 is added, backup units can be purchased in case of breakage and individual cases purchased to protect the device as students carry it between school and home. Traditional Windows or Apple-based platforms with more expensive features and expensive warranties can be purchased, but the per student cost of providing a one-to-one program increases with each added feature or improved specification.

Chromebooks have been used successfully at all grade levels and can use Google Applications that provide a word processor, a spreadsheet and presentation software. They can also use other cloud-based software and applications. This means if a student takes a Chromebook home, but does not have internet access or cannot configure their internet access to connect the Chromebook, then its value at home becomes limited; this also applies to other traditional platform-based devices if they rely on cloud-based products.

When initiating a one-to-one program, districts and schools usually begin by assigning computers at a specific grade level and then allowing students to use the computers as they advance to the next grades. In this manner, districts can build a one-to-one computer program in which all grade levels of students have a computer over a series of years. The need to do this may be lessened to the extent school districts purchased devices to help students participate in on-line instruction during the COVID-19 pandemic.

In short, one-to-one programs are more expensive. These programs raise the cost of three of the areas of the previously listed formula namely: 1) computer hardware, 2) network equipment, bandwidth, wireless coverage, and 3) instructional software if based on a per computer license.

Because going to a one-to-one ratio from a three-to-one ratio more than doubles the number of computers, it might be assumed that the cost of the other elements of the $250 formula might also double; however, the cost increase in not as drastic in the other areas.

For example, the $250 per student formula sets aside $55 per student for networking equipment, printers, and copiers. This figure presupposes capital costs for installation of district and school networks has already occurred and schools and districts are upgrading or replacing networking equipment such as switches and routers on a longer-term maintenance cycle.

To upgrade all district and school networks with the capacity to support a one-year implementation of a district wide one-to-one program would prove challenging and very expensive. Instead, this upgrade can be done incrementally if a one-to-one program is implemented over a three-year period. Currently, wired campus buildings should have the capacity to extend the network wirelessly and provide enough wireless coverage to handle most of the added demand. If a one-to-one program is implemented over a number of years, there is an opportunity to extend the wireless network over time. Thus, with a one-to-one program, the EB Model recommends increasing the $55 network equipment allocation by 36 percent to $75 per student annually.

Robust networks are extremely important to a one-to-one program, especially if statewide testing occurs simultaneously in multiple classrooms. To successfully implement one-to-one programs, all areas of the campus must provide internet connectivity ensuring every student has access to sufficient bandwidth anytime and from any learning space within the campus. If students are dropped from the network or there is slow access, the learning process is interrupted, and students are distracted.

Most campuses that have found the need to upgrade and extend their networks have chosen to do so through wireless access point installed in school buildings. This is now the cheapest and most effective way to spread adequate bandwidth to all learning spaces. Large scale implementation of wireless access points requires management software and hardware that can control, and shift bandwidth based on the ebb and flow of need during the school day. A wireless network that can adapt to bandwidth needs is important in a non-one-to-one environment and absolutely necessary in a densely packed one-to-one situation. Once a network is "extended," meaning access points have been placed to provide sufficient bandwidth to all areas of the campus, the ongoing cost of this element could diminish; however, it would not return to the $55 dollars per student (for the 3 to 1 ratio) as there are now more devices to maintain and replace in a natural maintenance cycle.

The other two elements of the formula deal with software, both enterprise software for financial and student systems, and instructional software such as productivity or subscription-based data bases. The cost increase in these areas depends on the specific products. If licensing is per machine, then costs will increase as the numbers of computers rises. If the software is cloud-based and driven by the number of user logins, then additional machines will not generate additional costs. One example is the Microsoft Office package. Purchasing the license to install on a machine equates to a cost per machine; however, when using Microsoft 365, the cost is per user and the user can download that package on multiple machines.

More software today is based in the cloud, and if Chromebooks are purchased, there is free productivity software that can be used. Because of these trends, the one-to-one model estimates that only modest increases will be needed in instructional software. This increase is based on some minor increases in software costs and some possible additional software purchases focused on student achievement. If extra funds are unspent in these two software elements, they should be directed to accelerate the network extension and the increase of bandwidth. The EB recommendation for a one-to-one implementation raises this element from $52 to $65, a 25 percent increase.

Table 3.19.5 summarizes cost difference for a three-to-one and one-to-one student to computer ratio. In the three-to-one student to computer ratio, the cost per student in the EB Model recommendation is $250 per student; in the one-to-one ratio, the cost increases to $350 per student, depending on the current networking capabilities of the district and its component schools and the software licensing agreements it maintains. It is important to note this does not include the increased costs for additional personnel needed to service the possible issues generated with over twice as many computers.

Table 3.19.5 Cost of Implementing a One-to-One Student to Computer Ratio from a Three-to-One Student to Computer Ratio*

Subcategory	Three-to-One Student-to-Computer Ratio	One-to-One Student-to-Computer Ratio
Computer Hardware	$74	$141
Networking Equipment, Copiers, Printers	$55	$75
Non-Instructional Software	$69	$69
Instructional Software	$52	$65
Total Cost per Student	**$250**	**$350**

***** Costs are associated with implementing a one-to-one computing program using a Chromebook platform costing approximately $350 using a three-year refresh and implementation cycle. In contrast, using a full-featured Windows or Apple-based laptop could double computer hardware costs.

Benefits of One-to-One Computing

In the first decade of the 2000s, advocates of one-to-one computing cited various potential benefits, including: improved student achievement (especially in writing skills), increased student engagement and collaboration, better implementation of project-based learning, an expansion of learning beyond the classroom, and instant access to information. Opponents claimed it was difficult to isolate technology as the only contributing factor to these benefits. Other drawbacks mentioned included: the cost, need for increased student supervision, and the necessity to provide additional professional development to teachers and other district staff (Sauers & Mcleod, 2012; Jackson, 2009; Goodwin, 2011).

One of most important benefits of implementing a one-to-one program consists of extending the learning environment beyond the school day thus increasing student collaboration during out-of-school hours, including the frequency with which students practice writing and communicating in written and other forms. However, unless internet access is ensured at a student's home and teachers use technology to change their strategies to take advantage of this access, then this benefit is left unrealized. This EB Model element does not include the potential cost of providing internet access to students who do not have access at home. Providing internet access for an individual at the current consumer rate over 10 months could cost approximately $300 per student annually unless leveraged through statewide procurement processes. Not ensuring that students have broadband available at home can create an equity and “homework” gap (COSN, 2017). This gap has been highlighted with the recent COVID outbreak and the move to distance learning.

In the past, successful one-to-one programs were driven by state/district/school leader advocates for these programs (Oliver, 2012). These programs demanded a high level of coordination between the instructional and business sides of the school district and a significant financial commitment. Because of the additional cost, they required board and community support. This is why states and/or districts usually experimented with pilot projects either at a school or grade level. It should be noted that with the forced move to distance learning caused by the 2020 spring outbreak of the novel Coronavirus, more government and school officials are seeing the need to migrate to online learning platforms and to provide additional professional development to teachers to understand, learn and utilize instructional best practices for teaching students outside of the traditional classroom environment.

The State could fund a one-to-one program by increasing the current allocation for technology expenditures from the Legislative Model and the EB Model recommendation to $350 per student. If Wyoming chooses to fund a shift to a one-to-one program, policy makers should understand that even with the changes forced by the COVID-19 crisis, effective implementation of a one-to-one computer program will require substantial effort to be effective in improving student learning.

J-PAL North America (2019) reviewed 126 studies of the use of technology in schools. Overall, the review found mixed effects, and great variability in programs and impacts. They concluded that caution should be used in implementing programs that are online only with no teacher-student contact. The study also found that computer-based reading programs tended to have modest effects, while some adaptive math programs had significant and larger effects; SimCalc an interactive math simulation for 7th and 8th graders, and Cognitive Tutor, a program for helping students with the foundations of algebra, had the largest positive impacts.

A coauthor of the J-PAL report expanded on how best to use computers in an online situation, responding to the COVID 19 school shutdowns (Oreopoulos, 2020). His study found that computer-assisted learning (CAL) programs – software students use to develop and practice reading, math and other skills – were effective in improving academic achievement across a range of programs and settings. The most effective CAL programs start with students first watching instructional videos and then proceeding through exercises at the students’ own pace. Effective programs then provide students immediate feedback, letting them know when and why they have answered questions correctly. One particularly effective, and no cost program was ASSISTments, through which teachers assign customized math homework and assess students’ assignments remotely; students also receive immediate feedback as they solve the assigned problems. The Khan Academy is another free CAL program, which covers multiple subjects at multiple grade levels. Khan Academy has released several new programs for schools in shutdown mode. The research on the impact of CAL programs on literacy and language art skills is mixed, though one program, ITSS (Intelligent Tutoring System for the Text Structure Strategy), had significant positive impacts on middle school student comprehension scores. As the demand for on-line programs grows, there will be increasing demand for clearinghouses at the state or national level to help teachers identify promising programs and provide information on how to access those programs.

The most recent meta-analysis of studies of learning in a one-to-one environment *published in a peer reviewed journal* (Zheng, Lin & Chang, 2016), found effect sizes of 0.16 SD for math, 0.25 for science and 0.12 SD for reading. On the other hand, Hull and Dutch (2019) studied one district and found that the results from converting to a one-to-one program produced statistically insignificant changes in student growth, though math scores improved by 0.13 standard deviations and reading saw little if any improvement.

Although there is substantial movement shifting to a one-to-one student-to-computer approach, more work and professional development will be needed to ensure that this increased use of technology is effective. Teachers and the education system responded quickly to the need for individualized computer access during the COVID-19 crisis. Wyoming and all other states should find ways to take advantage of this positive response to increased connectivity and use of computers through distance learning and provide the planning, curriculum change, and professional development needed to make both short and long term impacts successful.

Resource Use Analysis

The WDE's CRERW report combined expenditures for instructional materials and technology into one category for reporting purposes. In SY 2013-14, the Legislative Model generated a total of $58.9 million and the districts spent $49.0 million, or $9.9 million less than allocated. This represented 83.2 percent of the funds generated by the Legislative Model for technology and instructional supplies. It is not possible to determine what proportion of this went for technology specific equipment and supplies and what proportion went for textbooks and other supplies.

This pattern was true until 2017-18, the first year following the Legislature's decision to reduce the per pupil funding level down from the Legislative Model to the level recommended by the EB model. As a result, model allocations for technology and instructional materials dropped by about $20 million. In 2017-18 districts spent $51.8 million dollars on instructional materials and technology compared to the $41.5 million dollars allocated by the funding model, about 25 percent more than the model resourced. The pattern continued in 2018-19 with districts spending $51.7 million on instructional materials and technology compared to the model allocation of $40.8 million, or almost 27 percent more than the model allocated. It seems likely this pattern continues into 2019-20 as we would anticipate districts had to increase spending on both technology and digital curriculum materials due to the school shut-down caused by the COVID 19 pandemic.

PJ Panel Comments on Technology

Moving to 1:1 computing was the major topic in PJ panel technology discussions. No one suggested that 1:3 was adequate anymore, and most citied the general trend to 1:1 which has sped up by the COVID pandemic. Some also argued that with the inclusion of computer science in the educational basket of goods and services, 1:1 computing availability was essential if all students were to meet the new requirements.

Generally, panelists thought $350 per ADM was adequate to support 1:1 computing with a three to four-year replacement cycle and the availability of devices more sophisticated than Chromebooks for some advanced courses at the high school level. Chromebooks were the modal choice for devices, although one large district indicated that their 1:1 efforts were focused on Apple products, mostly I-pads and MacBook computers for some at the higher grades. Two panelists felt that $350 per ADM might be a little low, particularly given the growing cost of software and software licenses.

One panelist suggested that an important component of enhanced technology in schools was the need for Instructional Tech staff – that is staff to help teachers plan curriculum using technology. (This was not the topic of this element which focuses on dollar resources per pupil and specifically considers the cost of technology in the schools. The likely place to consider such positions is in the Instructional Facilitator element).

PJ panelists felt that the $350 per ADM for technology was adequate to also provide networks within the school but were concerned that resources were still needed to connect the school to wide area networks, and to ensure all students had access at home. There was also discussion of the dis-economies of scale and the cost of technology for small districts that can't negotiate prices as low as larger districts. One technology coordinator pointed out that his district purchases "strong servers" so they would be reliable at all times. The problem he indicated is that those servers could serve substantially more students/staff/faculty at roughly the same cost.

2020 Evidence-Based recommendation

Provide an amount equal to $250 per ADM and not subject to an ECA to continue the three-to-one student-to-computer ratio but increase it to $350 per ADM for a one-to-one computer ratio. The decision on 1:1 computing support is, we believe, a policy choice the state would need to make.

20. Career Technical Education Equipment/Materials

Vocational education, or its modern term, career and technical education (CTE), has experienced a shift in focus in the past decade. Traditional vocational education focused on practical, applied skills needed for wood and metalworking, welding, automobile mechanics, typing and other office assistance careers, as well as courses in home economics. Today, many argue that vo-tech is more appropriately info-tech, nano-tech, biotech, and health-tech. The argument is CTE should begin to incorporate courses that provide students with applied skills for new work positions in the growing and higher wage economy including information technologies (such as computer network management), engineering (such as computer-assisted design), a wide range of jobs in the expanding health portions of the economy and bio-technical positions – all of which can be entered directly from high school. The American College Testing Company and many policymakers have concluded the knowledge, skills and competencies needed for college are quite similar to those needed for work in the higher-wage, growing jobs of the evolving economy, so all students need a solid academic high school program to be college and career ready when they graduate from high school.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
Provide an amount equal to $10,313.88 per vocational education teacher FTE.	Provide an amount equal to $10,315.40 per vocational education teacher FTE.	Provide an amount equal to $10,000 per vocational education teacher FTE. Not subject to the ECA	-$88,266

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

The evidence and analysis for career technical education is provided in Element 5 above.

As that section concluded, the major cost areas for high quality CTE program are in class size, professional development and computer technologies. Most programs recommend class sizes of 25, a figure larger than provided for secondary school students by the Legislative Model. The professional development and most of the computer technology costs are covered through the professional development and technology components of both the EB and Legislative Models. In most other states, these would be new costs, but they are already embedded in the Wyoming school funding system.

However, a few of the high quality CTE concentration areas require a one-time purchase of expensive technology equipment, which can be covered by about $10,000 per CTE teacher. We noted in the discussion for Element 5 that the most expensive CTE programs are best organized by partnering with local firms, which have the super expensive equipment, rather than running such super high cost programs within school districts.

Resource Use Analysis

Analysis of CTE teaching positions is discussed in Element 5. In SY 2018-19, the Legislative Model allocated $2,891,144 to school districts for CTE supplies and equipment. School districts spent 65.8% of that amount, or $1,903,505, a difference of close to one million dollars.[26]

PJ Panel Comments on CTE Equipment and Materials

There was very little discussion of this topic by the PJ Panels. None of the panelists seemed to feel that the amount was too little.

[26] Source: CRERW Table sft_crerw_expend_analysis_table8_1-22-2020

2015 Evidence-Based recommendation

Provide an amount equal to $10,000 per vocational/career technical education teacher FTE, not subject to the ECA.

21. Extra Duty Funds/Student Activities

Elementary, middle and high schools typically provide an array of non-credit producing after-school programs, such as clubs, bands, sports, and other activities. Teachers supervising or coaching these activities usually receive small stipends for these extra duties.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
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 from the Legislative Model. 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.	For elementary grades, provide an amount equal to $26.0 per ADM. For middle and high schools, use inverse sliding scales based on ADM. Middle school funding levels range from $856.00 for 1 ADM and $221.16 per ADM for a school of 1,260 ADM. High school funding levels range from $2,206.59 for 1 ADM and $650.45 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.	For districts with 2,000 or more ADM provide $599 for each high school ADM, $322 for each middle school ADM and $25 for each elementary ADM. For districts with 500 ADM provide $1,497.50 per high school ADM, $805 per middle school ADM and $62.50 for every elementary ADM (2.5 times the number for a district with 2,000 or more ADM). Prorate the per ADM amount between 2,000 and 500 students. For districts with 150 or fewer ADM provide $1,797 per ADM for high school ADM, $996 per middle school ADM, and $75 per elementary school ADM (3.0 times the amount for a district with 2,000 or more ADM). Prorate the per ADM amounts between 500 and 150 students. Adjust these figures by an annual ECA.	-$2,953,401

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Research shows, particularly at the secondary level, that students engaged in student activities tend to perform better academically than students not so engaged (Feldman & Matjasko, 2005), although too much extra- curricular activity can be a detriment to academic learning (Committee on Increasing High School Students' Engagement and Motivation to Learn, 2004; Steinberg, 1996, 1997). Feldman and Matjasko (2005) found participation in interscholastic (as compared to intramural) sports had a positive impact for both boys and girls on: grades, postsecondary education aspirations, reducing dropout rates, lowering alcohol and substance abuse, and led to more years of schooling. The effect was particularly strong for boys participating in interscholastic football and basketball. One reason for these impacts is participation in interscholastic athletics places students in new social groups that tended to have higher scholastic aspirations and those aspirations "rubbed off" on all the participants. But the effects differed by race and gender and were not as strong for African Americans.

Fredericks & Eccles (2006) found that secondary students who participated in afterschool activities had higher academic outcomes, increased safety and higher participation in civic activities, and conversely reduced negative behaviors such as use of drugs and alcohol. Research shows that participation in high school athletics has positive impacts on educational attainment and even wages (Barron, Ewing & Waddell, 2000; Eoide & Ronan, 2001; Stevenson, 2010).

A U.S. Census Report (Knop & Siebens, 2018) found that that children tend to have higher levels of school engagement when involved in one or more activities, like sports, lessons or clubs. The report found that 42 percent of children who took lessons (i.e., music, dance, etc.) were highly engaged compared to 33 percent of children who did not. Children in poverty were less likely to participate in each of the three extracurricular activities (sports, lessons and clubs) than those not in poverty, and had less school engagement. Echoing these findings, Crispin (2017) used multiple methods to analyze data from a 1988 longitudinal study and found that for both at-risk and non-at-risk students' participation in extracurricular activities reduced the likelihood of dropping out of high school by 14 to 20 percentage points. In short, engagement is important because the greater the engagement the better students perform in schools and the less they drop out of school.

The positive impact of student activities on student performance are viewed by many as an integral component of a student's education. Across the country schools invest in student activities and students who participate in extracurricular activities from grades 8 to 12, attend college, vote in national and regional elections and volunteer at a higher rate (Zaff, et al., 2003).

Wyoming's student activities formula provides resources for schools at all levels, with higher levels of per pupil funding in the higher-grade bands. The research that exists on student activities focuses mostly on high school level activities. However, we continue to recommend that student activities, such as special interest clubs and intramural sports activities, are an important component of education at all levels, and include resource allocations as part of the EB model for activities in grades K-12.

During the past several years, the EB Model developed in other states has allocated between $200 and $314 per pupil for student activities, including intramural sports. These figures generally are in line with average amounts spent on such activities in many states. Wyoming presents a special case because of its many small districts and schools, which face much higher costs in providing interscholastic sports. Further, as the resource use analysis below shows, districts spend more on student activities than is currently provided in the Legislative Model, which, in turn, provides more than the EB Model. To better understand and develop an evidence-based recommendation for student activities, we asked District Leadership Services to help recalibrate this element.

Student Activities: Participation

A 2009 national survey (Aud, et al., 2012) asked high school seniors about their participation in high school activities including school newspaper, yearbook, music, performing arts, athletics, academic clubs (e.g., world language, science), student government and other school activities. The results of the survey can be viewed in Table 3.21.1. Student respondents indicated 38 percent participated in athletics, followed by other school activities at 32 percent and music and performing arts at 24 percent. There were differences in participation based on student gender. Female students participated in other school clubs at a rate of 40 percent, athletics 31 percent and music and performing arts 30 percent. Male students participated in activities in the following rates: athletics 46 percent, other social clubs 24 percent, music and performing arts 18 percent, and other activities 12 percent. Interestingly, other than athletics, female students participated in all other activities at higher rates than did male students.

Table 3.21.1 National High School Student Participation in Student Activities, 2009

Activity	Participation Rate (%)		
	Female	Male	Total
Newspaper Yearbook	11.30	5.80	8.70
Music Performing Arts	30.00	17.80	23.90
Athletics	31.40	46.00	38.40
Academic Clubs	16.50	11.60	14.00
Student Council	13.10	5.90	9.60
Other School Clubs	40.00	23.60	31.80

Source: Aud, et al. (2012).

Sparks (2019) reports on a more recent but less comprehensive poll of middle and high school students' participation in extracurricular activities. Sparks reports that a poll conducted by the C.S. Mott Children's Hospital found that that more than half of students responding participated in sports and 40 percent were involved in arts or other clubs during the 2918-19 school year. The poll found that only one in six secondary (middle and high) school students participated in no extracurricular activities. In short, large numbers of secondary students in America participate in extra-curricular activities.

Knop and Siebens, 2018 used U.S. Census data to estimate the percentage of children aged 6 to 17 who participated in sports, lessons, and clubs between 1998 and 2014. In years after 2000, the percentage of children participating in sports has been higher than participation in lessons or clubs. An increase in sports involvement occurred between 2011 and 2014, increasing by nearly 7 percentage points from 35 percent to 42 percent. Between 1998 and 2014, participation in clubs declined from 35 percent to 28 percent. Participation in lessons remained about 30 percent over these years. Children in poverty were less likely to participate in each of the three extracurricular activities (sports, lessons and clubs) than those not in poverty.

Additional information on student participation is available at the state level through the National Federation of State High School Association (NFHS), an organization providing leadership for the administration of education-based interscholastic activities. NFHS surveyed state level organizations to collect athletic program participation rates based on high school competition in SY 2017-18. Table 3.21.2 summarizes the NFHS findings for Wyoming and surrounding states. NFHS found high school participation rates for Wyoming students participating in athletics are at about the median participation rate of the seven surrounding states. Data for other types of student activities are not available. The participation rates contained in Table 3.21.2 count an individual who participated in two sports twice, three sports three times, etc.

Table 3.21.2 High School Student Activity Participation Rates in Student Athletics for Wyoming And Surrounding States, SY 2017-18

State	Boys*	Girls*	Total*	State Student Membership** (1)	Athletics Participation as a Percent of State Student Membership (%)
Wyoming	10,968	8,853	19,821	93,832	21.12
Colorado	72,901	59,525	132,426	865,011	15.31
Idaho	28,845	21,456	48,301	281,186	17.18
Montana	16,885	13,704	30,589	147,713	20.71
Nebraska	46,129	32,429	78,558	325,984	24.10
South Dakota	16,404	13,386	29,790	135,317	22.01
Utah	38,906	28,575	67,481	652,621	10.34

Source: *Survey conducted by National Federation of State High School Associations based on competition at the High School Level in the 2017-18 School Year.
**See Table 3.21.4

Student Activities: Expenditures

Though research is clear that participation in extra-curricular activities can positively impact students, Wyoming school districts currently spend more on student activities than is allocated through the Legislative Model, which provides more than the EB Model. The variable per pupil funding level provided through the Legislative Model provided an average of $333 per ADM for SY 2018-19. School districts spent an average of $423 per ADM in SY 2018-19. Table 3.21.3 displays student activity funding and expenditures for all Wyoming school districts from 2014-15 through 2018-19. The data also show that districts have been spending an *increasing* percentage more on activities than the funding model provides. Wyoming districts also spend an additional $8 million on activities transportation (reimbursed in the current transportation program), or about $82 more per pupil on average.

Table 3.21.3 Legislative Model Student Activity Resources Compared to Actual Expenditures, SY 2014-15 Through Sy 2018-19.

School Year	Legislative Model Funding ($)	Actual Expenditures ($)	Difference ($)	Actual as a Percent of Model Funding (%)
2014-15	31,034,594	40,238,478	9,203,884	129.7
2015-16	32,061,012	42,207,921	10,146,909	131.7
2016-17	31,763,857	41,677,441	9,913,584	131.2
2017-18	30,019,975	41,069,536	11,049,561	136.8
2018-19	29,991,592	41,125,531	11,133,939	137.1

Source: WDE CRERW report – sft_crerw_appendix_b

Given these high expenditures, it is helpful to compare Wyoming's expenditures per pupil on activities to other states, including states with large numbers of small districts. Table 3.21.4 compares Wyoming's student activities expenditures with those of the surrounding states for the 2017-18 school year. The table shows that Wyoming's activity expenditures (excluding those on activities transportation) are the highest among the surrounding states and are more than $100 per pupil above the expenditures in Nebraska (a state with numerous small school districts), the second highest per pupil activities spending state. The 2015 EB Model for the 2018-19 school year would have provided just $315 per student.

Table 3.21.4 Student Activity Expenditures Per Pupil, SY 2017-18

State	Total Student Activities Expenditures	Student Membership	Student Activities Expenditures Per ADM	Notes
Wyoming	$41,125,529	93,832	$438	(1)
Colorado	$193,760,665	865,011	$224	(2)
Idaho	$24,998,349	281,186	$89	(3)
Montana	$38,082,446	147,713	$258	(4)
Nebraska	$103,545,919	325,984	$318	(5)
South Dakota	$48,961,993	135,317	$362	(6)
Utah	$159,689,149	652,621	$245	(7)

Notes: (1) https://portals.edu.wyoming.gov/Reports/(S(mpyzfkcsftptnc2jrhaohtt5))/Public/wde-reports-2012/finance/crerw. Accessed June 17, 2020

(2) https://www.cde.state.co.us/cdefinance. Accessed June 17, 2020
(3) https://www.sde.idaho.gov/finance/. Accessed June 17, 2020
(4) https://gems.opi.mt.gov/SchoolFinance/Pages/ReportedExpenditureBySchoolDistrict.aspx. Accessed June 17, 2020
(5) https://sfos.education.ne.gov/. Accessed June 17, 2020
(6) https://doe.sd.gov/ofm/documents/18-State-Totals.pdf. Accessed June 17, 2020
(7) https://www.schools.utah.gov/financialoperations/reporting?mid=2159&tid=1. Accessed June 17, 2020

Our research did not find a common model for allocating state support for student activities or a model that recognizes the higher costs faced by small schools and districts. We recognize variable funding levels provided in the Legislative Model are important to school leaders in the Wyoming context. In 2015 we stated that if the Legislature wanted to continue a variable funding approach at the middle and high school levels based on school size, we recommended it reduce the per pupil revenue at each enrollment level such that the total funding remained the same as if activities were funded as a flat grant to districts. For 2020, we probed deeper into estimating adequate spending for student activities by developing sports and activities prototypes first for the generic (non-Wyoming) EB Model's prototypical 450-student middle school and 600-student high school and then determining whether those prototypes could be used for Wyoming's smaller prototypes.

Student Activities Prototypes

Our review began by developing sports program prototypes. To accomplish this task, we used current national participation rates in activities both for sport and non-sport areas at high school and middle school. We also made adjustments for Wyoming current activities especially at the middle school where, we have been told, students do not have opportunities outside the school district for club sport activities that are often run by the parks department or volunteers in the community in other states. Finally, we compared the new prototype student activities model per pupil resource allocations for middle and high school to actual school spending on activities in Wyoming.

The Legislative Model

The Legislative Model provides 2020-21 funding for activities and sports on a sliding scale basis for middle and high schools. The Model provides about $221 per pupil for a middle school of 1,260 ADM (four times the size of the prototypical middle school of 315 students) and then increases that amount by an average of approximately $0.50 per pupil down to a middle school of one student. That formula provides $325 per middle school pupil for a Wyoming prototypical middle school of 315 students, and $309 per pupil for a national EB Model prototypical middle school of 450 students. Similarly, the Legislative Model provides $650 per pupil for a high school of 1,260 students (twice the Wyoming prototypical size) and then increases that amount by approximately $1.24 per pupil down to a high school of one student. That formula provides, $780.54 per pupil for activities for a prototypical high school of 630 students.

These figures appeared high to us compared to spending for activities in other states. It was not immediately obvious why the prototypical high school of 630 students needed to spend twice as much per pupil as the larger high school of 1,260 students spent, and it was not clear why the prototypical middle school figures were as high as they were, again compared to the limited national data that are available at that level. We also knew in addition to these resources, Wyoming districts spent another $8 million on activities transportation (reimbursed in the current transportation program), or about $82 more per pupil on average. Wyoming has an accounting code that separately identifies expenditures for home to school transportation and activities transportation. Many other states also separate out these costs and do not reimburse for activities transportation costs. Wyoming has chosen to reimburse activities transportation costs at 100 percent, similar to regular and special education transportation. While we do not recommend a change in this report in this area, this may be an area that warrants further inspection to hold down costs.

Developing an Activities Prototype

We developed a prototype for the EB Model's prototypical 3,900 student district, particularly the prototypical middle and high school. The prototype district has two 600 student high schools, two 450 student middle schools, and four 450 student elementary schools. The high school is virtually the same size as the Wyoming prototypical high school although the middle school is larger than the Wyoming prototype. We used the EB Model prototypes of 600 and as a starting point for assessing the costs of funding student activities in Wyoming.

The High School Prototype

Focusing first on the high schools and utilizing national standards for participation, we made the following assumptions for each high school:

- 600 students in the high school (the 630 students in the prototypical Wyoming high school would not materially change any of the following numbers)
- 80 percent participate in activities
- 25 percent of the 80 percent participate in sport each season
- 75 percent of the 80 percent participate in other non-sport activities for the year
- 120 students participate in sport each season
- 360 students participate in other activities
- Number of male and female sport program participants are equal each season
- Coaches and non-sport directors' stipends are calculated from the base salary, a common custom around the country and in Wyoming
- Base or beginning salary for coaches and non-sport directors is the funding model's $38,099 plus benefits at 21.0 percent (excluding health insurance) or 46,149
- Costs for sports are 50 percent personnel and 50 percent supplies & materials
- Cost for non-sports are 75 percent personnel and 25 percent supplies and materials.

In building the prototype, we needed to specify the number of sports by season and estimate participation rates of males and females. Table 3.21.5 outlines our assumptions by sport. Overall, we assumed that the 600-student high school would offer a total of ten sports -- four in the fall and three in each of the winter and spring – with approximately equal numbers of males and females participating. While the specific sports and seasons of play could change the 10 sports identified were used to develop the prototype.

Table 3.21.5. High School Sports and Participation Rates for Fall, Winter and Spring

	Number of Boys Participating	Number of Girls Participating
Fall Sports		
Cross Country	10	10
Golf	10	10
Football	40	--
Volleyball	--	40
Winter Sports		
Basketball	30	30
Wrestling	15	--
Swimming	15	30
Spring Sports		
Soccer	30	30
Tennis	10	10
Track/Field	20	20

Table 3.21.6 identifies the number of coaches by season for each sport. In total, the model includes 14 head coach positions and 11 assistant coach positions.

Table 3.21.6. High School Coaches by Sport by Season

	Number of Head Coaches	Number of Assistant Coaches
Fall Sports		
Cross Country	1 for both teams	1
Golf	1 for both teams	1
Football	1	2
Volleyball	1	1
Winter Sports		
Basketball	2	2
Wrestling	1	--
Swimming	2	1
Spring Sports		

	Number of Head Coaches	Number of Assistant Coaches
Soccer	2	2
Tennis	1	1
Track/Field	2	--

Table 3.21.7 includes the personnel costs for the sports program. Head coach stipends equal 15 percent of base or starting compensation without health insurance or $6,922. Assistant coach stipends equal $4,153 or nine percent of base salary. Total coaching costs are $142,601. In some districts, individuals choose to share a stipend so that the number of assistant coaches is increased; that practice is certainly compatible with these numbers and would not change the overall costs. Based on national patterns, non-personnel costs such as equipment, supplies, referees, etc. are equal to personnel costs, bringing the total sports costs to $285,202. These costs do not include facility rental, field maintenance, field markings, custodial, etc. most of which are part of maintenance and operations.

Table 3.21.7. Costs of High School Sports Program

Sport Element	Number	Stipend as Percent of Base Compensation	Total Cost ($)
Head Coaches	14	15% ($6,922)	96,914
Assistant Coaches	11	9% ($4,275)	45,688
Total Coach Positions	25		142,601
Supplies, Referees, etc.		Equal to personnel costs	142,601
Total Sports Costs			285,202

In addition to sports, the model includes several other non-sport activities. Specifically, the model includes 11 different after school activities, each with an advisor. The stipend for advisors is 11 percent of the base compensation without health insurance, or $5,076 each or a total of $55,841. The types of non-sport activities could include the following or any other makeup that fits local needs:

- Drama
- Orchestra
- Cheerleader
- Yearbook
- Newspaper
- Dance
- Student Council
- DECA
- Vocal Music
- Band
- Debate/Forensics.

The specific activities could vary by district; eleven different types of non-sport activities are included to provide opportunities for all students at the school. Supplies and equipment costs of $19,160 for these activities would bring the non-sports costs to $74,454. The total cost for sports and non-sports activities for the prototypical high school of 600 students would be $359,657 -- $285,202 for sports and $74,454 for non-sports. The costs per high school pupil then would equal:

Sports	$475
Non-sports	$124
Total	$599

The number of $599 pupil for the cost of high school sports and activities might seem like a high number but it generally reflects what many districts spend on high school sports. For example, the Indian Prairie school district in Illinois spends about $635 per pupil for high school activities and the St. Charles school district in the same state spends about $650 per pupil. The figure of $599 is close to the $623 per pupil for high school activities in the Legislative Model for the large high school of 1,260 students; but this number of $599 per pupil would also work for smaller high schools at 600 or 630 students, as that is the size of the prototype just developed, thus suggesting that diseconomies of small scale for sports in Wyoming would not need to begin, until a high school's enrollment was below 600 students. Variance in the $599 per pupil amount is possible if a different base salary is used.

The Middle School Prototype

DLS also developed a middle school prototype. One difference from national participation patterns for Wyoming schools is that in many other states, the bulk of middle school sports opportunities are provided by park departments and non-school related, private clubs, which we were told was generally not the case in Wyoming. As a result, the middle school prototype described here includes more sports than would a prototype developed for other states. This adjustment made the student activities cost per pupil higher in Wyoming middle schools.

The assumptions about the percentage of participation in sport and non-sport activities remain the same as high school. Also, because there can be large differences in physical development between a sixth grader and an eighth grader, many of the sports require additional coaches to accommodate grade level teams. In developing the middle school prototype, we made the following assumptions:

- 450 student middle school
- 80 percent of students (360) participate in activities
- Of that 80 percent, 25 percent participate in sport each season and 75 percent participate in other non-sport activities
- Base salary is $38,099 plus 21.1 percent for coaches and assistant coaches
- Of the 360 students who participate in activities, 90 participate in sport each season (30/ grade level), and 270 participate in other activities
- Only two to three sports per season are offered because of the modest school size.

Table 3.21.7 identifies the type of sports by season and participation number for boys and girls. Clearly the specific sports and season in which they are played could change but the number of sports works for developing the prototype. There are seven identified sports for middle schools – two each in the fall and spring and three in the winter.

Table 3.21.7. Middle School Sports and Participation Rates for Fall, Winter and Spring

	Number of Boys Participating	Number of Girls Participating
Fall Sports		
Football	45	--
Volleyball	--	45
Winter Sports		
Basketball	45	45
Spring Sports		
Soccer	30	30
Track/Field	15	15

Table 3.21.8 identifies the number of coaches by season for each sport. In total, the model includes 8 head coach positions and 7 assistant coach positions.

Table 3.21.8. Middle School Coaches by Sport by Season

Fall Sports	Number of Head Coaches	Number of Assistant Coaches
Football	1	2
Volleyball	1	1
Winter Sports		
Basketball	2	2
Spring Sports		
Soccer	2	2
Track/Field	2	--
Total Coaches	8	7

Table 3.21.9 shows the costs of these coaching positions for middle schools. The base cost is less than for high school coaches and assistant coaches. The total cost for coaches is $55,841 plus the same amount for supplies, etc., which brings the total sports costs to $155,600.

Table 3.21.9. Costs of Middle School Sports Program

Sport Element	Number	Stipend as Percent of Base	Total Cost ($)
Head Coaches	8	9% ($4,153)	33,228
Assistant Coaches	7	7% ($3,230)	22,613
Total Coach Positions	22		55,841
Supplies, Referees, etc.		Equal to personnel costs	55,841
Total Sports Costs			111,682

The middle school model includes funds for six different non-sport activities, each with an advisor. A total of six advisors at nine percent of base salary or $4,153 each produces a total personnel cost of $24,921 for non-sport activities. The types of non-sport activities include the following:

- Intramurals
- Orchestra
- Cheerleader
- Student Council
- Drama
- Vocal Music
- Band.

The specific activities could vary by district, but the middle model assumes schools will offer six different types of non-sport activities. Non-personnel costs for these activities estimated at $8,307 (25 percent of the total activities costs as used in the high school model) would bring the non-sports costs to $33,228.

The total costs for all middle school student activities would then equal:

Sports	$ 111,682
Non-sports	$ 33,228
Total	$ 144,910

Producing a middle school cost per pupil of:

Sport	$248
Other	$ 74
Total	$322

We tested the middle school prototype against other districts to see if the assumptions and results hold up against actual spending. The results were higher by about 30% from other Wyoming districts because of the amount of sport being offered. This EB figure of $322 compares with about $318 per pupil for middle school activities in the Indian Prairie school district in Illinois and to $365 spent by the St. Charles school district in the same state. This figure is above the $203 figure used in the funding model for a middle school with 1,260 students. Variance in this per pupil amount is possible if a different base salary is used.

Elementary Schools

At the elementary level, Wyoming schools are very similar to other schools in other states. Small amounts of money per student are applied mostly to non-sport activities and field trips. For Wyoming, we used $25 per student which would generate $11,250 for a school of 450 students (the EB prototype), and $7,200 for a Wyoming prototypical elementary school. The expectation is most of this amount would be applied to small teacher stipends to support student clubs or to other activities like field trips that might incur transportation cost.

Comparative Analysis

We also created a "merged" overall per pupil student activities funding level. We did this by assuming an equal number of students for each of 13 grades and applying the school level figures to the proportionate number of students in elementary, middle and high schools. The merged amount was computed as follows:

[6/13 times $25] + [3/13 times $322] + [4/13 times $599] = $11.54 + $74.31 + $184.31 = $270.15

The merged amount ($270.15), when applied to EB district of 3,900 students yields $1,053,600. This figure would represent the evidence-based resources per pupil for a 3,900-student district with four 450-student elementary schools, two 450-student middle schools, and two 600-student high schools. Because the prototypes are built on a 600-student high school and a 450-student middle school, the results would also meet the requirements of a district with half that number of students or approximately 1,950 to 2,000 students, with two 450 student elementary schools, and one middle (450 students) and one high school (600 students).

We compared the merged figure of $270.15 per pupil for student activities to actual per pupil district spending in Wyoming for the 2018-19 school year, in districts that were substantially larger than 2,000 ADM, i.e., districts that would not need an adjustment for diseconomies of small scale for sports activities. Laramie #1 (Cheyenne) with 14,261 students spent $5,198,521 on activities or $364 per pupil, $94 dollars per pupil higher. Campbell County #1with 8,830 students, about twice the size of the EB prototype, spent a total of $3,866,326 on activities or $438 per pupil, $168 per pupil more than the merged prototype estimate of $270.15.

We also were interested in comparing the $270.15 EB estimate to 4,000 and 2,000 student districts in Wyoming to ascertain how that number compared to current student activity spending. Using 2018-109 spending data for our analysis we found that Albany #1 (Laramie) with 4,014 students, very close to the EB Model 3,900 student prototype, spent $1,086,447 on activities, or $270 per pupil, exactly the same as the merged EB Model. Teton #1 with 2,869 students spent $905,250 or $316 per pupil, $46 more than the merged EB Model number of $270.15. Freemont #25, with 2,457 spent $910,722 or $371 per pupil, $101 above the merged EB model number of $270.15. Interestingly, Park #6 with 2,034 students, half the size of Albany #1, spent $1,052,022 on activities, almost the same total amount as Albany #1 or $517 per pupil, $247 more than the merged EB estimate of $270.15.

We then estimated the cost of applying the following separate school level activities figures -- $25 elementary, $322 middle school, and $599 high school – to the elementary, middle and high school ADM in each Wyoming district, as a new allocation formula for activities. For districts with 2,000 or more ADM we provided $599 for each high school ADM, $322 for each middle school ADM and $25 for each elementary ADM. For districts with 500 ADM we provided 2.5 times those figures or $1,497.50 per high school ADM, $805.0 per middle school ADM and $62.50 for every elementary ADM. For districts between 500 and 2,000 ADM we prorated the per ADM amount. For districts with 150 or fewer ADM we provided 3.0 times the initial dollar values or $1,797 per ADM for high school ADM, $966 per middle school ADM, and $75 per elementary school ADM. Finally, we prorated the per ADM amount between 500 and 150 ADM, and for districts with 150 or fewer ADM we continued to use the values that are three times the initial amounts we estimated ($599, $322, and $25) per ADM. This produced an average EB activities allocation of about $315 per ADM.

We then compared this size-adjusted figure of $315 per pupil to per pupil spending for student activities in the surrounding states. It is higher than the activities spending in all the surrounding states except South Dakota (see table 3.21.4 above).

Application to Wyoming School Districts

To apply this to Wyoming prototypes, and to accommodate the diseconomies of scale found among small school districts, we used the activities allocations described above to generate new EB model activity funding for all of Wyoming's school districts. Our estimates appear in Table 3.21.10. The table displays the Legislative Model allocation for 2018-19, actual school district expenditures for the same year, and the amount each district would receive under the 2020 EB model for 2020-21. The table shows that the EB model allocates just over $2.9 million less than the Legislative Model and is almost $11 million less than districts spent for activities. The last column of the table shows how the EB allocation compares to the Legislative model allocation. Districts with a percentage below 100% would receive less under the EB model, while those with a percentage greater than 100% would receive more under the EB model. Twenty-five districts receive less under the EB model while 23 gain funding.

Table 3.21.10 Comparison of Actual Activities Spending with the Legislative Model and the 2020 Evidence-Based Model in 2020-21

District Name	Legis-lative Model Allocation ($)	Actual Expen-ditures ($)	2020 Evidence-Based Model	Actual as Percent of Legis-lative Model ($)	Actual as Percent of 2020 EB Model (%)	EB as Percent of Legis-lative Model (%)
Albany #1	1,241,659	1,086,447	1,013,543	87.5	107.2	81.6
Big Horn #1	621,966	649,385	651,958	104.4	99.6	104.8
Big Horn #2	374,162	481,704	428,151	128.7	112.5	114.4

District Name	Legis-lative Model Allocation ($)	Actual Expen-ditures ($)	2020 Evidence-Based Model	Actual as Percent of Legis-lative Model ($)	Actual as Percent of 2020 EB Model (%)	EB as Percent of Legis-lative Model (%)
Big Horn #3	297,088	250,127	328,206	84.2	76.2	110.5
Big Horn #4	203,368	245,567	217,174	120.7	113.1	106.8
Campbell #1	2,483,638	3,865,325	2,050,993	155.6	188.5	82.6
Carbon #1	748,051	1,134,447	575,152	151.7	197.2	76.9
Carbon #2	429,404	556,634	362,635	129.6	153.5	84.5
Converse #1	615,507	763,824	578,076	124.1	132.1	93.9
Converse #2	330,835	299,431	354,795	90.5	84.4	107.2
Crook #1	715,275	736,382	544,169	103.0	135.3	76.1
Fremont #1	715,953	945,604	598,131	132.1	158.1	83.5
Fremont #2	107,908	173,355	110,366	160.7	157.1	102.3
Fremont #6	272,891	236,021	296,470	86.5	79.6	108.6
Fremont #14	345,612	475,686	394,366	137.6	120.6	114.1
Fremont #21	226,289	362,989	234,937	160.4	154.5	103.8
Fremont #24	230,806	316,381	242,782	137.1	130.3	105.2
Fremont #25	777,389	910,722	653,173	117.2	139.4	84.0
Fremont #38	126,137	157,579	159,844	124.9	98.6	126.7
Goshen #1	848,986	1,152,090	588,085	135.7	195.9	69.3
Hot Springs #1	370,107	432,596	457,444	116.9	94.6	123.6
Johnson #1	585,211	1,045,002	581,319	178.6	179.8	99.3
Laramie #1	3,625,236	5,198,521	3,240,563	143.4	160.4	89.4
Laramie #2	583,704	655,814	500,460	112.4	131.0	85.7
Lincoln #1	345,044	339,231	352,230	98.3	96.3	102.1
Lincoln #2	990,798	1,435,679	696,856	144.9	206.0	70.3
Natrona #1	3,656,433	3,620,924	3,334,229	99.0	108.6	91.2
Niobrara #1	427,508	310,822	543,136	72.7	57.2	127.0
Park #1	652,319	1,002,574	585,174	153.7	171.3	89.7
Park #6	720,476	1,052,022	537,818	146.0	195.6	74.6
Park #16	98,209	164,531	96,835	167.5	169.9	98.6
Platte #1	516,453	453,603	538,267	87.8	84.3	104.2
Platte #2	151,918	176,197	154,384	116.0	114.1	101.6

District Name	Legis-lative Model Allocation ($)	Actual Expen-ditures ($)	2020 Evidence-Based Model	Actual as Percent of Legis-lative Model ($)	Actual as Percent of 2020 EB Model (%)	EB as Percent of Legis-lative Model (%)
Sheridan #1	677,311	657,021	573,558	97.0	114.6	84.7
Sheridan #2	1,050,401	1,319,932	910,276	125.7	145.0	86.7
Sheridan #3	88,332	142,164	87,088	160.9	163.2	98.6
Sublette #1	505,417	587,251	575,062	116.2	102.1	113.8
Sublette #9	331,099	325,216	370,209	98.2	87.8	111.8
Sweetwater #1	1,447,816	1,290,746	1,230,951	89.2	104.9	85.0
Sweetwater #2	835,192	1,351,894	678,770	161.9	199.2	81.3
Teton #1	860,144	905,086	709,205	105.2	127.6	82.5
Uinta #1	910,907	1,228,463	717,863	134.9	171.1	78.8
Uinta #4	407,078	533,729	481,509	131.1	110.8	118.3
Uinta #6	388,362	591,062	480,275	152.2	123.1	123.7
Washakie #1	527,870	626,153	630,088	118.6	99.4	119.4
Washakie #2	80,008	135,988	79,776	170.0	170.5	99.7
Weston #1	396,275	468,214	455,723	118.2	102.7	115.0
Weston #7	171,635	275,394	178,710	160.5	154.1	104.1
State of Wyoming	**33,114,184**	**41,125,529**	**30,160,783**	**124.2**	**136.4**	**91.1**

Student Activities: Summary

Our conclusion is that the Legislature make the call on how much and how to fund activities. Legislators could simply apply an ECA to the current approach; that would still provide a level of dollars less than what districts spend. But it would not alter the distribution of dollars. On the other hand, the Legislature could adopt the 2020 EB Model prototypes and use district level ADM to allocate activities resources as follows: For districts with 2,000 or more ADM provide $599 for each high school ADM, $322 for each middle school ADM and $25 for each elementary ADM. For districts with 500 ADM provide $1,497.50 per high school ADM, $805 per middle school ADM and $62.50 for every elementary ADM (2.5 times the number for a district with 2,000 or more ADM). Prorate the per ADM amount between 2,000 and 500 students. For districts with 150 or fewer ADM provide $1,1797 per ADM for high school ADM, $996 per middle school ADM, and $75 per elementary school ADM (3.0 times the amount for a district with 2,000 or more ADM). Prorate the per ADM amounts between 500 and 150 students. These figures should then be adjusted annually by an ECA. This would provide a level of revenues close to the current model, would signal that sports spending should be reduced, but would alter the actual distribution of activities funding.

PJ Panel Comments on Activities

As this element shows, expenditures in Wyoming for student activities are notably higher than activities expenditures in other states. When we asked why this was, several reasons were provided. The most frequent is that distances in Wyoming are greater than in most other states so that school teams have to both travel long distances and often stay overnight to compete with schools in the same athletic class. In one instance a panelist said that some distances are so great they are required to have two drivers to ensure the bus driver does not exceed the maximum hours her or she is allowed to drive in a day.[27]

Another common reason provided for high expenditures was the high participation rates for students. The data available suggest that participation rates may be somewhat higher in some Wyoming districts. Many small districts indicated they have gone to four-day weeks because so many students and teachers are out on Fridays for athletic events. The challenge these districts face is that the long travel times require early departure times to reach the other school in time for a game.

It also appeared from the conversation with the PJ Panelists that the number of sports (and to some extent other activities) offered in Wyoming is higher than in many other districts or states. There also appears to be higher numbers of coaching but about the same number of advising positions per activity in Wyoming, and PJ panelists indicated that stipends for coaching and advising were a about the same percentage of beginning salaries as they are in other states.

One panelist indicated that with the exception of golf, her district offered the same number of sports for middle schools as it did for high schools. The difference was there was no overnight travel for the middle school students. She argued that middle school activities were under-funded under her district's model.

From interviews with several Wyoming superintendents and business officers, we have concluded that there are at least three factors behind the state's high spending on activities, other than diseconomies of small scale for many districts. Districts with ADM at or above the EB prototypes tend to offer many more sports. Those districts also hire more coaches and assistant coaches for many of those sports. And those districts tend to provide stipends linked to their actual base salaries, which on average is closer to $49,000 rather than the model base of $38,099 that we used for the prototypes. Further, many Wyoming state champion tournaments include a larger number of districts than many other states, thus adding another cost-push element.

The challenge in developing a student activities model for Wyoming is the current wide variation in per pupil spending across the 48 school districts, and the fact that nearly all districts spend significantly above the model. Nevertheless, we would argue that the new EB Model's prototype provides an adequate amount for districts with 2,000 students or more.

[27] It should be noted that this cost would be reimbursed under the transportation reimbursement for school districts

2020 Evidence-Based recommendation

The Legislature should choose between:

Applying an ECA to the current activities funding formula, or

Adopting the new EB sports and activities prototypes that for districts with 2,000 or more ADM provide $599 for each high school ADM, $322 for each middle school ADM and $25 for each elementary ADM. For districts with 500 ADM provide $1,497.50 per high school ADM, $805 per middle school ADM and $62.50 for every elementary ADM (2.5 times the number for a district with 2,000 or more ADM). Prorate the per ADM amount between 2,000 and 500 students. For districts with 150 or fewer ADM provide $1,797 per ADM for high school ADM, $996 per middle school ADM, and $75 per elementary school ADM (3.0 times the amount for a district with 2,000 or more ADM). Prorate the per ADM amounts between 500 and 150 students. Adjust these figures by the ECA.

CENTRAL FUNCTIONS

22. Operations and Maintenance

Computation of operations and maintenance costs is complicated by the lack of a strong or consistent research base. Some school finance models allocate a percentage of current expenditures to operations and maintenance. The EB Model uses formulas to compute the number of personnel needed for custodial, maintenance and grounds workers, and the Legislative Model has used those formulas to estimate staffing for operations and maintenance costs since the 2005 recalibration. Additionally, funding is provided for utilities.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
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	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	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	-18 Custodian FTEs -$2.1 million *Note: Differences for custodians are due to class sizes which generate teachers, which are then used in the custodial formulae.*

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
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).	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).	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).	
<u>Maintenance Worker Positions</u>: 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	<u>Maintenance Worker Positions</u>: 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)	<u>Maintenance Worker Positions</u>: Calculated on the basis of three factors: 1) building; 2) the lesser of actual educational GSF or SFD allowable educational GSF adjusted up by 115%; 3) school ADM.	32 Maintenance worker FTEs $5.1 million *Note: FTE differences for maintenance workers due to the elimination of the $5 million*

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
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	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	These three factors are added together and divided by three 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; 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	*operating cost factor from 2020 EB Model recommendations*.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
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 received 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 upon	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 educational 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 received 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 upon	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 received 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 upon	 No Change in number of Grounds-keepers -$3.7 million

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
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.	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.	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.	-$58,447

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
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, inflated annually to $0.70. 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) inflated annually. For additional school buildings added (not replacement schools) to a school district's	Supplies and Materials: Funding for O&M supplies is calculated at a rate of $0.73 per GSF if 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: Actual SY 2009-10 expenditures by district as adjusted by 2015 Wyoming Session Laws, Chapter 142, Section 2, Section 205 footnote 2(a)(i)(D) and (ii)(D) and further adjusted by -10.762% (SY 2017-18) and 10.823% (SY 2019-20). For additional school buildings added to district building inventories after SY 2009-10, 100% of SY 2009-10 district average utility expenditures per gross square foot, as adjusted by the	Supplies and Materials: Funding for O&M supplies is calculated at a rate of $0.73 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 2018-19 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 as computed annually. For additional school buildings added (not	$1,820,198

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Staff FTE Difference
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.	Legislature, for district school buildings multiplied by the additional authorized educational square footage.	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.	

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

The approach used in the EB Model to estimate adequate levels of resources for operations and maintenance was developed for Wyoming during the 2005 recalibration and reviewed during the 2010 and 2015 recalibrations. It provides school- and district-based custodial positions, district-based maintenance positions and district-based groundskeeper positions. We sought to recalibrate this element in 2015 and 2020, but in the process determined that there is little if any new evidence related to the operation and maintenance of schools. Consequently, our recommendations for funding operations and maintenance have not changed materially. In 2015 we used several independent consultants from around the country and in 2020 tapped the expertise of three former school superintendents who are partners in District Leadership Solutions.

This section has two parts: one that reviews the literature on the linkage between facilities and student performance and a second focused on professional standards in staffing for operations and maintenance.

<u>Review of Literature and Recent Studies of Wyoming Operations and Maintenance</u>

The research evidence linking the operations and maintenance of schools directly to student performance is both limited and mixed. Even without a strong basis to support the linkage between facility quality and student outcomes, all students are entitled to attend schools in a safe, clean and well-maintained environment. Further, the Wyoming Supreme Court's *Campbell* decisions affirm the importance of adequate school facilities, and the State has spent a great deal of effort and money to construct new school buildings or renovate existing buildings. The importance of operating and maintaining this investment is clear regardless of the strength of the relationship between them.

Earthman (2002) underscored the importance of school facility conditions noting at the time that researchers had consistently found a deficit of between 5 and 17 percentile points in student performance in poorly maintained buildings compared to students in standard buildings. The research Earthman cites also suggests via correlational analysis that teacher effectiveness decreases in schools with poor facilities. This led Earthman, who was for many years the leading researcher on school facilities in the United States, to argue not only for the importance of clean, facilities, but also for the importance of quality thermal and acoustic materials in the environment where students learn.

Similar work completed by The Tennessee Advisory Commission on Intergovernmental Relations (Young, et. al., 2003), showed a statistically significant relationship between the condition of a school or classroom and student achievement. Students attending schools in up-to-date facilities scored higher on standardized tests than those in substandard buildings. The committee concluded that policy makers should consider the relationship between school facilities and student learning outcomes, not only because of safety and welfare responsibilities to the students and staff, but also because a lack of adequate funding for facilities repair and maintenance can undermine spending in other areas focused on educational reform.

Young, et. al. showed positive educational outcomes were correlated with the following factors:

- New facilities
- Well-maintained buildings
- Thermal regulations to avoid excessive temperatures
- Appropriate lighting levels
- Utilizing relaxing shades of paint, and
- Limited external noise.

Contrary to this, Picus, Marion, Calvo and Glenn (2005) studied the correlation between the quality of Wyoming school facilities and student outcomes. School quality was measured with a 100-point scale developed specifically for Wyoming schools and used to assess every school. These scores were correlated with measures of student outcome controlling for student characteristics, and no statistically significant relationship was found. While this finding does not mean the State should abandon its efforts to provide safe, clean and well-maintained facilities, expectations that student performance will improve with better facilities should be moderated.

In 2015, we reviewed two draft reports related specifically to the school facility funding in Wyoming prepared for the Select Committee on School Facilities. Both reports were prepared by the School Facilities Commission with the assistance of the 21st Century School Fund.

The first publication, titled “Strengthening Wyoming Schools and Our Communities,” described efforts Wyoming made in both school construction and major maintenance of school facilities since the first *Campbell* ruling. The report noted the State had made great progress in improving the quality of school facilities and identified 32 more schools in need of replacement or major improvements, with 14 of the schools then scheduled to receive funding through the major capital construction program for planning or design.

The second report, "Now and for the Future: Adequate and Equitable K-12 Facilities in Wyoming," reviewed the investments in capital improvements over 15 years from 2000 to 2015 and made recommendations about funding for school facilities into the future. The report noted a change in the way in which funds were used to support schools in this area might be needed, suggesting Wyoming should continue to provide districts with predictable and adequate funding to allow schools to meet facilities requirements, focusing on *asset preservation* as opposed to diverting large sums of money for large *capital construction and renovation* remedies. The report suggested current funding for major maintenance should be used in concert with the routine maintenance funding through the Legislative Model.

The second report also argued there were significant differences between the amount generated by the Legislative Model for operations and maintenance and what districts spent. The report suggested district spending for operations and maintenance was higher than funded through the model and concluded in many instances that salary levels in the Legislative Model were lower than those paid by the school districts. However, our review of the CRERW report[28] shows that since 2006-07, expenditures for operations and maintenance were less than the model allocation every year except for 2010-11, when districts spent just over $534,000 more than they were allocated. In 2014-15, the Legislative Model provided districts with $3.5 million more than the spent for operations and maintenance. By 2018-19 that difference had grown to $6.2 million.

In addition to these reports, for the 2015 recalibration, a group of school business leaders prepared a "white paper" outlining several issues related to operations and maintenance funding. The school leaders commended the State for its investment in school facilities, but also highlighted what they describe as the added need for districts to operate and maintain facilities with modern, technology enhanced, sophisticated control systems. They noted modern buildings are complex, with increasing use of automated equipment that required additional preventative maintenance performed by highly skilled staff. An additional level of expertise and training is required to support the new buildings, which often translates into a need to hire a specialized staff such as licensed electricians, plumbers or HVAC technicians at higher salaries than the model funded custodians, maintenance workers and groundskeepers. The white paper stated that schools were struggling to recruit and retain needed staff to perform the work under the funding levels in the Legislative Model at that time, despite the fact that over a nine-year period operations and maintenance expenditures only exceeded model funding once – in 2010-11. Since the last recalibration, between 2015-16 and 2018-19, the model has provided school districts with $24.5 million more for operations and maintenance then they have spent on that function.[29]

The white paper suggested that many districts hire fewer operation and maintenance staff than are funded. This should not be viewed as an "over funding" of staff positions because many districts chose to contract for specific work rather than hire their own staff. Given the increasing need for advanced skills for maintenance and repair of newer facilities, this approach makes sense, and the operational question in our view is whether the funding level for operations and maintenance is adequate, regardless of the choice of made between district employees and

[28] CRERW Report – sfp_crerw_expend_analysis_table7_1-22-20.
[29] CRERW Report – sfp_crerw_expend_analysis_table7_1-22-20.

contracted services. What is not known is the extent to which the model generated $6.2 million districts did not spend on operations and maintenance were used for contracting for operations and maintenance services or spent in other areas.

Professional standards for operations and maintenance staff

Drawing on professional standards in the field as well as research, in 2010 we conducted analyses of the cost basis for staffing maintenance and operations (e.g., Picus & Odden, 2010; Picus & Seder, 2010). For the 2020 recalibration, we asked District Leadership Solutions to review the EB approach, to review other public and private sector approaches to these elements, and to recommend changes, if merited, to the EB model for these elements. The discussion below summarizes our research on operations and maintenance, identifying the needs for custodians (school level), maintenance staff (district level) and groundskeepers (school and district level), as well as the costs of materials and supplies to support these activities.

Custodians

Custodians are responsible for the cleanliness of school classrooms and hallways as well as for routine furniture set ups and takedowns. In addition, custodians often manage routine and simple repairs like minor faucet leaks and replacing light bulbs, and are expected to clean restrooms, cafeterias/multipurpose rooms, lockers and showers. Custodial workers' duties are time-sensitive, structured and varied. Many schools see custodians as a front-line employee who often interact with teachers and students on a daily basis. Custodians are also often responsible for ensuring that major mechanical equipment within the facility is running well and identifying appropriate services to make repairs when needed.

Zureich (1998) estimates the time devoted to various custodial duties:

- Daily duties (sweep or vacuum classroom floors; empty trash cans and pencil sharpeners in each classroom; clean one sink with faucet; and, security of room), which take approximately 12 minutes per classroom.
- Weekly duties (dust reachable surfaces; dust chalk trays and clean doors; clean student desktops; clean sink counters and spots on floors; and, dust chalk/white boards and trays), each of which adds five minutes a day per classroom.
- In addition to these services, non-cleaning services (approximately 145 minutes per day) provided by custodians include: opening school (checking for vandalism, safety and maintenance concerns), playground and field inspection, miscellaneous duties (teacher/site-manager requests; activity set-ups; repairing furniture and equipment; ordering and delivering supplies), and putting up the flag and physical education equipment.

The Zureich formula that was developed to consider these cleaning and non-cleaning duties was updated by Nelli (2006). The formula takes into account teachers, students, classrooms and gross square feet (GSF) in the school. The formula is:

- One custodian for every 13 teachers, plus
- One custodian for every 325 students, plus
- One custodian for every 13 classrooms, plus
- One custodian for every 18,000 allowable GSF[30], and
- The total divided by four to calculate a base FTE school level custodian position.

This base FTE position is further adjusted by an additional 0.5 FTE for secondary schools. Schools with 49 or fewer ADM do not generate custodial FTE positions. Custodian positions for non-educational buildings are based solely on the gross square footage (GSF) factor, which is limited to 10% of a district's total allowable educational GSF divided by the Zureich factor (18,000 GSF).

The formula calculates the number of custodians needed at prototypical schools and the district. The advantage of using all four factors for the school custodians is it accommodates growth or decline in enrollment and continues to provide the school with adequate coverage for custodial services over time.

District Leadership Solutions (DLS) found three other standards for determining custodians for school buildings:

1. A public formula used in Pennsylvania (Pennsylvania Association of School Business Officials (PASBO))
2. A private sector formula used by Aramark and other private providers of cleaning for schools, and
3. A public formula used by Florida to suggest M & O staffing for schools.

In order to compare the four different approaches, DLS used a simulation for the generic EB model that comprises a 3,900-student prototypical school district, with four 450-student elementary schools, two 450-student middle schools and two 600-student high schools. The 2015 EB and Legislative Models yield a total of 23.3 custodians for this generic EB model.

The Pennsylvania formula for staffing custodians uses the same four factors as the EB and Legislative models – number of teachers, students, classrooms and GSF as well as the additional factor of the number of washroom fixtures (sinks, urinals, toilets), but has different benchmarks for each of these five elements. Pennsylvania's model is as follows:

- 1 custodian for every 9 teachers
- I custodian for every 300 elementary/200 secondary students
- 1 custodian for every 12 classrooms
- 1 custodian for every 16,000 Gross Square Feet (GSF)
- 1 custodian for every 35 washroom fixtures (sinks, urinals, toilets)
- All the above summed and divided by 5.

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[30] Allowable GSF is the lesser of actual educational GSF or 115% of the School Facilities Department's allowable educational GSF.

The Pennsylvania model yields a total of 27.3 custodians for the EB prototypical district or four additional custodians.

The private sector model employs a simpler formula for cleaning, using only Gross Square Footage (GSF) of the building. It then takes 80 percent of the GSF as Cleanable Square Footage (CSF) and provides one custodian position for every 22,000 CSF for elementary schools and one custodian position for every 28,000 CSF for secondary schools. The private sector model yields just short of 20 custodians for the EB prototypical model, about 3.3 fewer custodians than the EB model and 7.3 fewer than the Pennsylvania model.

The Florida model is similar to the private sector model but uses 19,000 CSF instead of 22,000 CSF. This would allow for more custodians than the private sector model but fewer than the Pennsylvania model putting it very close to the current EB model. The Florida model would produce 25.8 custodians, 2.5 more than the current EB model.

All four models are relatively close in their calculation of custodial staffing. The Pennsylvania model, though, assumes a higher level of cleanliness that is often associated with hospitals and nursing homes. The private sector model assumes that cleaning is largely a nighttime function provided by part time workers. Schools, however, need custodial support during the day so the leaner private sector model would place at most one custodian at the school during the day. The Florida model produces somewhat more custodians. Given the current distribution and size of schools across the state, we conclude that the current EB model, which provides a level of custodial staff in between these three alternative standards, is the most appropriate choice for staffing custodians for the education sector and recommend that Wyoming continue to use this approach.

Maintenance Workers

Maintenance workers function at the district level, rather than at individual schools. Core tasks provided by maintenance workers include preventative maintenance, routine maintenance and emergency response activities. Individual maintenance worker accomplishment associated with core tasks are (Zureich, 1998):

- HVAC systems, HVAC equipment, and kitchen equipment
- Electrical systems, electrical equipment
- Plumbing systems, plumbing equipment, and
- Structural work, carpentry and general maintenance/repairs of buildings and equipment.

Zureich recommends a formula for maintenance worker FTEs incorporated into the funding model for instructional facilities as follows:

- Calculated on the basis of four factors:
  - An initial 1.10 maintenance worker FTE, plus
  - One maintenance worker for every 60,000 allowable educational GSF at factor of 1.2, plus
  - One maintenance worker for every 1,000 School ADM at factor of 1.3, plus

    - One maintenance worker for every $5 million of general fund operating expenditures from SY 2004-05 at a factor of 1.2.
- These four FTE factors are added together and divided by four to arrive at a base maintenance worker FTE.
- The base FTE is further adjusted for:
    - School level (base FTE is multiplied by 0.80 for elementary schools, 1.0 for middle schools, and 2.0 for high schools)
    - 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
    - Small district size where the base FTE is multiplied by a factor of 1.10 for districts with ADM under 1,000.

For the 2020 EB model we recommend eliminating the general fund operating expenditure within computation. The size of school district general fund budgets has increased considerably in the 15 years since this formula was developed, and we are unable to identify an empirical basis for finding an alternative number. The impact of eliminating this computation allocates an additional 31 maintenance worker positions across the state compared to the 2015 EB model and an additional 30 maintenance worker positions compared to the Legislative model.

It is assumed 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.

Florida has a simpler formula to determine the number of maintenance workers:

- One Maintenance FTE for every 45,000 sq. ft
- One Support FTE for every six maintenance workers.

The current EB model formula produces 10.24 maintenance staff in a prototypical school district of 3,900 students while the Florida formula produces 13.8 maintenance staff plus 2.3 support staff to support the maintenance workers – this amounts to 3.56 more maintenance workers and 2.3 more support staff.

The current EB model uses a standard recommended by Zureich (1998). In our search for how other states provided for maintenance workers, we could not find any state, except Florida, that either directly used a standard for maintenance worker staffing or suggested a standard. Most states simply do not reach this level of detail in their school funding models.

Unlike custodians, there is some uncertainty in projecting staffing loads and maintenance costs without assessing the individual needs of each district and its composite buildings. For example, one district that has a centralized HVAC control system might be able to monitor and project motor or condenser failures well in advance and thus hold down costs, while this possibility is not available to another district that does not have a centralized HVAC monitoring system. Private sector companies that provide services in this area utilize sophisticated software that calculates staffing needs and costs based on the individual inventory of the district.

Given the discussion above related to the need for more specialized support in some districts or schools, and the variation in facilities across Wyoming, we argue that with the exception of the general fund computation, the current formula for maintenance staffing be retained. In addition, we recommend that both individual districts or consortiums of districts investigate purchasing maintenance analysis software similar to that utilized by the private sector to help districts find efficiencies in the future.

Groundskeeper Positions

The typical goals of a school grounds maintenance program are generally to provide safe, attractive, and economical grounds maintenance (Mutter & Randolph, 1987). This, too, is a district level function. We have estimated that an elementary school needs 62 days per years of groundskeeper support, a middle school 140 days and a high school 388 days per year. Groundskeepers are determined at the site rather than building/program level. The number of groundskeepers for all sites, both educational and non-educational, is based on the following:

- 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
- The Legislative Model has added additional requirements for groundskeeper FTE calculations for acreage acquired by a district after July 1, 1997. These sites' acreages are based upon the lesser of the actual site acreage on which the facility is situated or the School Facilities Department's (SFD) 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 SFD 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.

The State has made adjustments in this area to ensure school districts with large plots of undeveloped land are not overstaffed when calculating groundskeeper staff allocations.

District Leadership Solutions does not recommend changes in the staffing formula for groundskeepers but indicated there are ways that districts could save substantial dollars in this function. In Northern states, the bulk of the grounds work occurs during the summer and could be done by either part-time workers like college students returning home or by full-time custodians who are not needed to clean their school facilities when they are unoccupied. In either case, each school district should seek to find efficiencies in this category.

Florida has a suggested staffing formula for groundskeeper positions for schools, that is simpler than the Wyoming formula. Florida's formula is as follows:

- Total acreage divided by 40
- Add one FTE
- Plus, one FTE per 500,000 gross square feet (GSF) of athletic fields.

This formula produces more groundskeeper positions than the EB Model, but we see no compelling rationale to adopt it for Wyoming.

Supplies and Materials

Maintenance and custodial supplies were estimated at a rate of $0.64 per GSF during the 2010 recalibration for both educational and non-educational space, and then inflated annually to $0.70 in 2015. The Legislative Model used an amount equal to $0.69 per GSF for the 2018-19 school year. 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.

Analysis in CRERW shows that districts actually spent more on supplies and materials in 2018-19 than what was allocated in the legislative model, although in eight of the last 13 years, expenditures for supplies was less than what the model generated.[31] When checking with private providers of cleaning services for schools, we found that they have experienced a steady increase in supplies and materials costs at a rate approximately equal to the CPI. We recommend that the model continue to use an appropriate ECA for supplies and materials. For 2020-21 operation and maintenance supplies and materials have been increased by an ECA to $0.73 per GSF.

Utilities

The Legislative Model's current funding formula for utility expenses uses the actual expenditures for utilities in a base year, and adjusts the base by an inflation factor and adds any new school square footage. In SY 2018-19 school districts spent $38.1 million for utilities while the funding model generated $32.4 million in funding. Districts have consistently spent more for utilities than the model generates.[32]

The 2019-20 school year likely will be an anomaly with respect to utilities expenditures. The COVID-19 pandemic school closures will likely result in lower utility usage and costs. The state should carefully assess how the utilities external cost adjustment will impact funding for utilities in future years. It is possible that it is time to select a new base year, but SY 2019-20 and probably SY 2020-21 are likely poor choices for a base year given the unknown impact of COVID-19 closures on school operating costs.

[31] CRERW Report – sfp_crerw_expend_analysis_table7_1-22-2020.
[32] CRERW Report – sfp_crerw_expend_analysis_table8_1-22-2020.

School districts should be encouraged to utilize funding in this area to find energy efficient improvements such as automating their HVAC systems, replacing aging boilers, improving roof insulation, etc. These initiatives could be, if approached collaboratively with the state, a chance for school districts to improve their classroom environment and save money long term.

Resource Use Analysis

For SY 2018-19, the Legislative Model allocated $102.4 million to school districts for maintenance and operations (both personnel and supplies) and school districts spent $96.2 million or $6.2 million less than the amount allocated for both personnel and supplies.[33] This pattern has been the same for at least a decade as shown in Table 3.22.1.

Table 3.22.1: School District Operation and Maintenance Costs Compared to the Legislative Model, 2009-10 to 2018-19

Year	Model Allocation ($)	Actual Expend. ($)	Difference ($)	Model Allocation ($)	Actual Expend. ($)	Difference ($)	Total Difference (4)
2009-10	74,658,703	4,195,225	(463,478)	11,781,985	12,004,780	222,795	(240,683)
2010-11	76,042,351	76,277,983	235,632	11,875,887	12,174,487	298,600	534,232
2011-12	81,421,334	78,348,182	(3,073,152)	12,316,537	11,899,197	(417,340)	(3,490,492)
2012-13	82,075,457	79,608,880	(2,466,577)	12,222,575	12,319,946	97,371	(2,369,206)
2013-14	81,173,381	79,798,510	(1,374,871)	12,337,653	11,665,717	(671,936)	(2,046,807)
2014-15	83,257,062	80,887,767	(2,369,295)	12,616,885	11,456,136	(1,160,749)	(3,530,044)
2015-16	87,726,390	84,664,233	(3,062,157)	13,043,080	11,596,084	(1,446,996)	(4,509,153)
2016-17	88,800,083	83,745,146	(5,054,937)	13,116,185	12,457,314	(658,871)	(5,713,808)
2017-18	89,946,140	82,713,227	(7,232,913)	13,624,883	12,778,479	(846,404)	(8,079,317)
2018-19	88,889,660	82,094,534	(6,795,126)	13,543,717	14,091,430	547,713	(6,247,413)

Source: WDE, sfp_crerw_expend_analys_table7_1-22-2020

Utilities are funded on the basis of actual utility expenditures in a base year adjusted by an inflation factor, focused specifically on the cost of utilities. For SY2018-19, the total model allocation for utilities was $32.4 million with districts spending $5.7 million more than allocated.[34] The pattern of over expenditure on utilities has existed for at least a decade as shown in Table 3.22.2. In our PJ panels – summarized below – participants indicated that the over expenditures for utilities are a function of three factors:

1. New schools coming online. Although designed to be energy efficient, new schools tend to consume more energy than older schools. This is a function of more sophisticated HVAC systems and the use of air exchangers in buildings. Enhanced air circulation and ventilation requirements resulting from the COVID-19 pandemic may further increase energy costs.

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[33] CRERW Report – sfp_crerw_expend_analysis_table7_1-22-2020.
[34] CRERW Report – sfp_crerw_expend_analysis_table8_1-22-2020.

2. New school construction. When a new school opens, the additional funds generated by the model for the utility costs of that school are not distributed to the school district until the year after the school opens. The impact of this delay is relatively small and has only impacted eight school districts since FY 2011-12; with seven districts adding one or two schools in that time frame and Laramie #1 adding six schools during those years.

3. Uneven application of the ECA. Although there is a separate ECA computed annually for utility costs, the Legislature has not consistently applied the ECA and in some instances has only put the ECA in place for two years, with model resources reverting back to pre-ECA adjustment levels. This uneven application of the ECA may also have let to utility expenditures exceed model allocations. Other issues that impact the difference between actual utility costs and allocations through the model include utility expenditures to fund "enhanced" school district facilities – local district decisions to provide facility options beyond the State facility standards including additional square footage, stadium lighting, swimming pools, etc.

Table 3.22.2: School District Utility Costs Compared to the Legislative Model, 2009-10 to 2018-19

Year	Model Amount ($)	District Expenditures ($)	Difference ($)	Expenditures as a Percent of Model (%)
2009-10	33,152,577	33,512,546	359,969	101.1
2010-11	33,152,577	34,442,067	1,289,490	103.9
2011-12	34,072,968	34,493,329	420,361	101.2
2012-13	34,087,478	35,111,870	1,024,392	103.0
2013-14	34,077,197	37,781,543	3,704,346	110.9
2014-15	34,114,651	37,492,800	3,378,149	109.9
2015-16	35,741,920	36,230,789	488,869	101.4
2016-17	35,345,365	38,269,346	2,923,981	108.3
2017-18	32,355,251	38,052,419	5,697,168	117.6
2018-19	32,364,941	38,113,373	5,748,432	117.8

Source: WDE, sfp_crerw_expend_analys_table8_1-22-2020

The three factors cited above (higher energy use of newer schools, the one-year lag in adding the utility costs of new schools when they come online, and the uneven application of the ECA over time) suggest that the utility costs in the model need to be adjusted to reflect actual experiences of school districts. Because SY 2019-20 and SY 2020-21 are unusual years due to the COVID-19 pandemic, we recommend using school district utility expenditures from SY 2018-19 to rebase the model and adjust that amount by the utility ECA that was prepared as part of this recalibration (Taylor, 2020b).

Cost Savings

The following options are recommended to enhance the data available for operations and maintenance, and to help increase operational efficiencies in operations and maintenance departments of school districts. District expenditures could be reported with more detailed categories in place. For example, salary and benefits and total FTE reports by title – custodians, maintenance workers (carpenters, plumbers, electricians, HVAC engineers, etc.) and groundskeepers – would be helpful for future analysis. Also, the comparisons of contractual expenses and consumable supply costs should be reported separately to allow for some comparisons by regions or size. Districts could also purchase HVAC monitoring software to assess HVAC operations and identify needed replacement and maintenance activities before systems fail. Districts can also look for ways to implement shared services to maximize the investment in staff, training and equipment. While the size and scarcity of the population of Wyoming present many challenges to shared services, if systems between districts could be standardized, it is possible highly skilled, hard to recruit staff could be paid slightly more, yet serve multiple schools or districts. Also, very expensive equipment, which is not needed daily, could be used by multiple schools or districts. This could reduce overall costs by districts and reduce the overall funding requirements.

PJ Panel Recommendations on Maintenance and Operations and Utilities

Discussion on Maintenance and Operations and Utilities focused on three areas:

1. The increasing complexity of major physical plant systems has made it more difficult for school districts to hire maintenance workers with the skills needed to maintain these systems; moreover, when skilled employees can be identified, they often are able to earn higher wages working in the private sector. As a result, districts often contract for services for which they can no longer hired skilled workers. Small and rural districts also argued that finding contractors to maintain and repair facilities is hard, and the district is often “held hostage” to exorbitant charges for the services. Panelists also pointed out that one implication of this is that districts appear to underspend for maintenance and operations and overspend for contracted services.

2. Utility costs exceed the model allocation because even though more energy efficient than in the past, modern buildings have more HVAC equipment using power and thus total energy costs for modern buildings are higher than in the buildings they replace. The increasing ventilation demands for COVID-19 school openings may further increase the power usage of all schools.

3. The uneven application of the ECA over time has led to the Legislative Model no longer maintaining a cost adjusted allocation for utilities.

Although in the past the under-spending in maintenance and operations has compensated for the over-spending in utilities, panelists expressed concern that when contracted services are included, this “balance” no longer exists and when fully accounted for, maintenance and operations expenditures are closer to the model allocation, further supporting the need to adjust the model for utility costs.

2020 Evidence-Based recommendation

Continue with current EB Model and Legislative Model formulas for custodians, and groundskeepers. For maintenance workers remove the portion of the computation related to school district general fund dollars. For utilities use the 2018-19 actual expenditures of school districts adjusted by the ECA developed for utilities for 2019-20 and 2020-21. Increase supplies and materials for maintenance and operations to $0.73 per gross square footage.

23. Central Office Staffing/Non-Personnel Resources

All districts require central office staff to meet the overall management needs of their educational programs. School district central office administrators exercise essential leadership, in partnership with school-site leaders, to build capacity throughout public educational systems for teaching and learning improvements (Honig, et al., 2010). Central Office functions include the overall management of all aspects of a school district regardless of enrollment size including fiscal management (including budgeting, accounting and enrollment and fiscal projections), supervision of teaching and learning, human resources, legal matters and communications. Central Office functions require both certificated and non-certificated personnel.

Hanover Research (2013), found that U.S. school districts of all sizes implement a wide variety of organizational structures, making it challenging to identify clear best practices. The literature, instead, focuses on defining traits of effective district offices and qualities of effective leaders. Hanover Research's findings show the majority of school districts it has studied employ a superintendent who exercises general authority and subordinate district staff who share district management and leadership responsibilities.

The larger the school system, the more complex the central office. Determining an adequate staffing level for very small districts is also challenging. The EB Model has developed staffing models using a prototypical district of 3,900-4,000 students in other states. In most instances, when prorated down for smaller districts, fewer staff are generated than are currently allocated through either the Wyoming EB or the Legislative Models. This is because historically, for small districts in Wyoming, both the EB and Legislative Models have provided more staff than would result in a simple downward proration of the core EB Model prototypical district.

This element also describes the non-personnel resources districts need to maintain their offices and programs. The following table depicts central office staffing for the 2015 EB Model, the Legislative Model, the new 2020 EB, along with the estimated cost difference.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
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 to 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	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 $378.06 per ADM for non-personnel	Central Office Personnel: 500 or fewer ADM: 2.5 administrative and 2.0 classified positions. 1,000 ADM: 3.0 administrative and 4.0 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM. 2,000 ADM 4.0 administrative and 8.0 classified positions. Position counts prorated down linearly between 2,000 to 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 $378.78per ADM for non-personnel	-51 Administrative Position FTEs -$7.5 million 32 Classified or Clerical Position FTEs $5.0 million

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
ADM for non-personnel resources.	resources, with an annual ECA. (2020-21 amount estimated at $400.26	resources, with an annual ECA (2020-21 amount estimated at $400.00)	

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

This element includes two issues: staffing for central offices and non-personnel costs of the central office.

This review is based on the core purposes of school districts as described by the Annenberg Institute for School Reform (Simmons, 2010):

- Provide schools, students, and teachers with needed supports and timely interventions
- Ensure that schools have the power and the resources to make good decisions, and
- Make decisions and hold people throughout the system accountable by using indicators of school and district performance and practices.

The central office staffing models provided in the EB Model were established to ensure that administrators spend some portion of their time in schools, that human resource functions include building principals in hiring school site staff, and that the financial officer is cognizant of curriculum and instruction issues.

According to the Center for the Study of Teaching and Policy at the University of Washington (Honig, 2010), central district officers "…are essential players in the process of instruction; therefore, the decision of how to allocate central office administrators and classified staff is critical to the school improvement process and student success."

The EB Model and Legislative Models rely on staff allocations for the central office based on district ADM. The Legislative Model provides staffing for central offices for four enrollment categories: less than 500, 501 to 1,000, 1001 to 3,500 and above 3,500 students. In 2015, the EB model was analyzed by a group of school superintendents working with Picus Odden & Associates and updated to provide central office staffing for six enrollment categories: less than 500, 501 to 1,000, 1,001 to 2,000, 2,001 to 4,000, 4,001 to 12,000 and above 12,000 students. Both models exclude central office staffing for transportation and special education as those functions are 100 percent reimbursed. Both models also exclude any staffing for preschool as that is not in the state's funding formula. Further, school computer technicians, which the EB Model typically includes in central office staffing, are provided for in Element 12, Librarians, reflecting Wyoming specific history.

Until 2015, central office staffing for the funding model largely reflected recommendations from an early adequacy study – with some updates over time. It provided relatively high staffing levels for school district central offices and used just three ADM categories: less than 500 students, 501 to 1,000 students, and more than 1,000 students, assuming that the staffing for the 1,000-student district could simply be prorated up for districts with more students, an assumption that ignored substantial economies of scale for central offices larger than 1000 students.

The 2015 Recalibration

For the 2015 recalibration, we identified central office staffing positions for a greater range of school district enrollment categories than we used prior to 2015. By increasing the number of school district size categories, the model was better able to reflect the economies and dis-economies of scale with multiple "prototype" districts. One outcome of this process was the realization that a prototypical district for estimating central office staffing was larger than the 1,000 students that was previously used in Wyoming.

In 2015, we engaged a team of three school superintendents, with nearly 100 years of administrative experience among them, to help identify a new set of central office staffing recommendations. They investigated central office staffing recommendations for school districts with ADM of 250, 500, 1,000, 2,000, 4,000 (close to the 3,900 EB prototypical district used in most of our studies outside of Wyoming) and 12,000 students. Following their analysis and conversations with school leaders in Wyoming, we developed the central office staffing recommendations reported in the table above. The final model did not include a separate district enrollment category for school districts with 250 or fewer students.

The central office staffing recommendations *exceeded* the staff allocations that would result from prorating down from the 3,900 prototypical district used in the EB Model. If the Model prorated central office staff down from the 3,900-student district (4,000 in Wyoming), it would provide fewer staff resources than both the 2015 EB and Legislative Models – just one professional staff and two classified staff in a 500-student district.

The 2020 Recalibration

Thus, we undertook another detailed review of central office staffing for the 2020 recalibration This section describes the actions we undertook to develop a central office model, and the discussions with the Professional Judgment panels that led to our final recommendations that take into account the feedback from those panels. We asked District Leadership Solutions (DLS) and its three principal partners, also successful former superintendents, to conduct the analysis. DLS partners have over 100 years of combined experience of leading districts of various sizes. Combined they have spent many years working with districts that sought either to merge or divide and helped them design central office staffing structures to meet the needs of their new enrollment numbers.

In undertaking this analysis, DLS drew on their collective experience in school finance and from the budgets of the school districts they served, as well as their relationships with numerous superintendents, chief business officials, vendors and professional associations. Their recommendations were based on the review of multiple district organizational patterns, variations in district enrollment, and other models for districts of varying sizes that reflect the Wyoming context.

Recommendations were based on the following assumptions:

- Smaller districts often contract out some services or rely upon a county or regional office of education for some services that cannot be provided efficiently internally. This could include sharing some central office services across districts within a Wyoming county.

- Superintendents assume the majority of responsibility for the management of their school district, and then assign specific duties to additional central office positions, as well as to building principals or teacher leaders. The involvement of building administration in central office administration most often occurs in small districts where there typically is a districtwide administrative team that provides both central office and school site administrative tasks.

- As enrollment grows in a school district, the number of central office personnel increases and specialty positions expand, thus, allowing for creating a systems-approach with multiple administrators and classified staff providing services.

- Special Education and transportation central office services continue to be covered by Wyoming's special education and transportation reimbursement programs.

In general, DLS retained the EB recommendations for districts with ADM of 4,000 and 12,000 students and proposed reducing staffing for districts with 500 or fewer students, 1,000 students and 2,000 students. Specifically, DLS recommended the following changes:

- **For a district with 500 or fewer students**: Provide two rather than three professional positions and continue to provide three classified positions. The rationale for this recommendation was the following:

  Two administrators allow for a superintendent to have overall district management responsibilities and an additional administrator of the district's choosing to manage the "operations" functions of finance, payroll, human resources, and facilities. Comparable-size districts in other states shared additional responsibilities among central office administrators, building principals and teacher leaders, with principals often leading the curriculum function under superintendent direction. The EB Model's Instructional Facilitators provided schools with additional curriculum leadership.

  DLS's review of other small, rural districts indicated superintendents also served in a variety of roles, including principal, coach, part-time maintenance, bus driver, etc. Those individuals "get by," but the structure did not provide for the best educational opportunities. Therefore, DLS recommended that districts with 500 or fewer students be allocated two central office administrators, supported by three classified positions. DLS strongly supported districts' flexibility to determine the exact distribution of responsibilities.

As discussed below, we did not accept all of this recommendation.

- **For a district with 1,000 students**: DLS recommended that it be provided (as the Legislative Model) four professional and four classified positions, decreasing the latter from 6.5 in the 2015 EB Model. This doubled the central office professional staffing from the 500-student district and increased the clerical positions from three to four. The rationale was as follows:

  If the 4,000-student model were prorated down to a 1,000-student district, the model would result in a reduction of administrators from eight to two. Maintaining four administrators is balanced by reducing clerical from 6.5 to four positions.

  As discussed below, we did not fully accept this recommendation.

- **For the 2,000- and 4,000-student district**: The baseline for comparisons for all district sizes is the EB Model's 3,900 to 4,000-student prototypical district that includes staffing for eight professional and 16 classified positions. DLS recommended that this baseline be retained. DLS also recommended that the prorated numbers of four professional and eight classified staff for the 2,000-student district were adequate, and we agreed with these recommendations. Districts at 2,000 students as well as smaller districts will often have the CFO/Business Manager position oversee operations, food service, and transportation, whereas larger districts might have a manager position for those functions.

  For a district of 12,000 students, the EB Model provides 24 professional positions and 39 classified positions. That is less than a direct multiple of three beyond the 4,000-student district, recognizing there are economies of scale above 4,000 students in staffing a school district's central office up to 12,000 students. DLS recommended that this recommendation be retained, and we agreed.

Comparing Wyoming to the EB Model in Other States and Developing New Prototypes

These new recommendations (which we modify below) still provided more central office staff in Wyoming than would be provided by simply prorating down the standard EB Model's central office staffing for a prototypical district of 3,900-4,000. In other states, the EB Model typically prorates down the central office for a district with 4,000 students to a district with 400-500 students without any adjustments for small size. Table 3.23.1 compares the 2015 EB Model, the Legislative Model, the initial recommendations developed by DLS, and the central office staffing that would result from prorating the EB Model down from the prototypical 4,000 student district. The last column of Table 3.23.1 shows the number of central staff the EB prototypical district would provide by simply prorating the staff numbers for the 3,900-4,000 district of eight professional and 16 classified staff to 2,000, 1,000 and 500 student districts.

Using a straight proration, the 2,000-student district would receive half the staffing of the prototype, or four professional and eight classified positions. This proration would provide fewer professional staff in the central office than the 2015 EB and Legislative models, and fewer classified staff than the 2015 EB Model, but more classified staff than the Legislative Model.

Table 3.23.1 Central Office Staffing Positions for District of Various Sizes

Types of Positions	2015 EB Model	Legislative Model	DLS Recommendation	Prorating EB for 4,000 ADM District
2,000 Student District				
Professional	5.5	5.6	4.0	4.0
Classified	9.0	6.4	8.0	8.0
1,000 Student District				
Professional	4.0	4.0	4.0	2.0
Classified	6.5	4.0	4.0	4.0
500 Student District				
Professional	3.0	3.0	2.0	1.0
Classified	3.0	3.0	3.0	2.0

Source: Authors' Calculations

For the 1,000-student district, the EB prorated numbers equate to two professional and four classified positions, compared to four professional positions in each of the other three models. The prorated EB classified staffing level of four equals both the Legislative Model and the DLS model, but is less than the 6.5 classified positions in the 2015 EB Model. The 2020 EB prorated model for 500-student central office staff of one professional and two classified positions is less than the staffing level of all three other models.

What is the appropriate central office staffing model for Wyoming school districts? For small districts, one approach to answering this question is to consider the central office staff needed in conjunction with the likely number of school level administrative staff in different size districts. In Wyoming, depending on how a district chooses to establish individual schools, a 500-student district would be resourced for three principals if it had an elementary school, a middle school, and a high school. Given the likely small size of each of these three schools, it is reasonable to assume that school site administrators could undertake some district functions such that one central office professional position, along with three school site administrators, would be sufficient to manage the district's operations. This aligns with the DLS finding that in small districts the "administrative team" is not so neatly divided into "central office" and "school site" administration but pooled as most administrators deploy some combination of "central office" and "school site" functions.

If a small (500 or fewer students) district had fewer than three schools, an alternative combination of four administrators at the district and school level is still a feasible option. For example, the Flambeau School District in northern Wisconsin has 571 students. It is organized into one K-12 building (something that is less likely in a 500-student district in WY), and the combined central office and school staff include:

- 1 Superintendent
- 1 Elementary principal
- 1 Secondary principal
- 1 Special education director/psychologist
- 1 Dean

Only three of the staff in the example above are certified administrator positions. In many states the special education director and dean would be teaching positions, not administrative positions – at least in a small district. In Wyoming, the special education director would be separately reimbursed.

The Flambeau district has the following classified staff:

- 1 Food Service Director (who is also a cook)
- 1 Bookkeeper
- 1 Technology Director
- 1 Receptionist
- 1 Principal Secretary
- 1 Finance Secretary
- 1 Special Services Secretary
- 1 Administrative Assistant
- 1 Maintenance Director.

The food service director/cook, and maintenance director are not full-time managers and can be assumed to be expensed in the food services and maintenance functions, not the central office.

That leaves three professional administrative positions and two teacher positions in the central office/school administration, and seven classified staff (excluding food and maintenance), for a total of three professional administrative positions and seven classified positions. In Wyoming, the special education director and secretary are funded through the special education reimbursement, which reduces the comparative central office staffing to three professional administrative positions, the dean position, and six classified positions. The dean position is a teacher position and would be included in school level teacher FTEs. The three professional positions and six classified positions for this district, combining central office and schools, is one classified position higher than the three professional administrative and 5 classified positions identified in the prorated EB Model (1 central office position, two principal positions, two central office secretarial, and two school secretaries and one school clerk positions), making the prorated EB model a tad less generous than the staffing in this Wisconsin district. Thus, we conclude that the prorated EB Model for central office staff, together with school administrative staff, comes up modestly short in providing adequate resources for both schools and the central office in a 500-student district. We also note the need for an IT director, but perhaps not at a full FTE.

Therefore, we posit a new "prototypical" central office and school staffing model for districts with 500 (or fewer) students. The district would have two rather than three schools: one K-6 elementary school of about 250 students and one Grade 7-12 secondary school of about another

250 students. Each of those schools would trigger a principal and school secretary, totaling two principal and two school secretary positions. The secondary school would also trigger a 0.8 assistant principal position (250/315). We set the new 500 student central office EB Prototype at 2.5 central office professional positions and 2 clerical positions, with the specific positions as follows:

Professional

- 1 Superintendent
- 1 Business/operations manager leading finance, HR, facilities, transportation and food
- 0.5 FTE IT director.
- 1 Special education/student services director and secretary covered by the special education reimbursement.
- Curriculum support would be provided by the two principals and the instructional facilitators that are part of the EB model.

Classified

- 1 Superintendent secretary
- 1 Bookkeeper/pay roll classified position

This central office prototype has 2.5 professional positions, including the 0.5 IT director and two clerical positions. Curriculum support would be provided by the principals and instructional facilitators that are part of the EB Model. The other half of the IT director could be covered by the school computer technician allocation to create a full-time position.

We next developed a central office prototype for the 1,000-student district. A 1,000-student district would have something like two 230-student elementary schools, one 230-student middle school and one 315 student high school. Under both the EB and Legislative Models, this configuration would produce four school level principals and 1.0 secondary AP positions (and four school secretarial positions). In addition, it would produce approximately one school clerical positions. The prorated EB Model for the central office would provide two professional staff and four clerical staff. However, we propose a new 1,000-student central office prototype that would be somewhat larger:

Professional

- 1 Superintendent
- 1 Business/operations manager leading finance, HR, facilities, transportation and food
- 1 IT director
- 1 Special education/student services director and secretary covered by the special education reimbursement
- Curriculum support would be provided by the principals and the instructional facilitators that are part of the EB model.

Classified

- 1 Superintendent secretary
- 1 Bookkeeper/pay roll position

- 1 Secretary for business manager
- 1 IT secretarial position.

This configuration requires three professional positions – superintendent, business manager, and IT director. It requires four classified positions – superintendent secretary, bookkeeper/payroll, business manager administrative assistant, and IT secretary. Curriculum support would be provided by principals and the Instructional Facilitators provided in a separate element of the EB model. This prototype would then require three professional and four classified positions, one more professional position than the prorated EB Model.

Sheridan #1 is a Wyoming district with about 1,000 students. Its central office staffing includes:

Professional

- 1 Superintendent
- 1 Business/operations manager
- 1 Curriculum director

Classified

- 1 Superintendent administrative assistant
- 2 Business manager administrative assistants
- 1 Curriculum director administrative assistant.

The district also has a special education director and administrative assistant. Excluding special education, then, the district has three professional positions and four administrative positions in the central office. However, for technology services, it also contracts out the equivalent of one IT director and two school computer technicians. Counting the IT director, then, this district has four professional and four classified central office positions. If the curriculum support roles were taken over by principals and the three plus instructional facilitator positions, staff provided by the EB model, the curriculum director position could be converted to an IT director, thus providing the district with three professional positions and four classified positions in the central office. So, the 1,000 student EB prototypical central office would be:

Professional

- 1 Superintendent
- 1 Business/operations manager
- 1 IT director

Classified

- 1 Superintendent administrative assistant
- 2 Business manager administrative assistants
- 1 IT administrative assistant.

With respect to the 2,000-student district, the prorated 2020 EB model provides fewer positions than either the 2015 EB Model and the Legislative Models, but here we accept the DLS recommendation. Additionally, the prorated 2020 EB Model reflects adequate staffing for school districts with 2,000 students. Take for example the 2,036-student Grafton School district in Wisconsin, considered a five-star school district by the Wisconsin Department of Education – five-star essentially meaning a well-run district with high performance. Grafton is located 20 miles north of Milwaukee Wisconsin. Historically, Grafton was primarily a blue-collar community; it experienced a transition over the last two decades, and now has many residents who commute to jobs in Milwaukee.

The Grafton school district has one high school, one middle school, and two elementary schools. The school sizes approximately mirror the EB Model's prototypical school sizes of about 600 high school students, 450 middle school students and 450 students in each of the two elementary schools. The district has about 17 percent of students eligible for free and reduced lunch and 13.7 percent of students with special needs. In terms of performance, 62 percent of students scored proficient or higher on the state accountability test versus the state average of 36.8 percent.

The Grafton central office includes the following five professional administrative positions:

- Superintendent
- Director of Teaching & Learning
- Business Manager
- Technology Director
- Director of Student Services/Special Education.

In addition, the central office includes the following nine classified positions:

- Receptionist
- Payroll and Benefits
- Bookkeeper
- Food Service
- Purchasing
- Superintendent's Administrative Assistant
- Computer Network Administrator
- Teaching and Learning Administrative Assistant
- Student Services Administrative Assistant.

In the Wyoming context, the Director of Student Services/Special Education and that position's administrative assistant would be included in the Special Education program, and fully reimbursed. Eliminating those positions from the central office staffing count leaves the central office with 4 professional administrative positions and 8 classified positions, the exact number of the proposed prorated EB Model. This central office configuration is very close to that of Park County #1. It too has four professional and several classified central office positions that could be covered with an allocation of eight such positions. However, the superintendent would like five professional positions.

Thus, the 2,000-student EB prototype central office configuration would be:

Professional:

- 1 Superintendent
- 1 Assistant superintendent/curriculum director
- 1 Business manager/operations/HR manager
- 1 IT director

Classified:

- 1 Superintendent secretary
- 1 Assistant superintendent secretary
- 1 Accountant
- 1 Payroll
- 1 Accounts technician
- 1 Assistant superintendent secretary
- 1 Receptionist
- 1 IT director secretary

We conclude that the prorated EB Model of four professional and eight classified central office positions provides adequate central office staffing for the 2,000-student district.

Central office Non-Personnel Costs

It is also important to provide resources for non-personnel costs incurred by school districts at the central office. These costs are difficult to estimate because districts make vastly different decisions regarding the use of their own staff versus contracting for many services. Contracting costs would appear in a district's accounts as a non-personnel cost. As a result, some districts may have fewer staff and higher contracting costs while other districts may have more staff costs and lower contracting costs. As those trade-offs are made by individual districts, funds from one category can be used to support the other category. Our DLS consultants viewed the current Legislative Model's per pupil resources as adequate to meet the non-personnel costs of school districts. Consequently, the level of funding in the Legislative Model of $378.06 per ADM is retained as adequate for the 2020 EB Model, assuming it is adjusted for inflation through an ECA in the future.

Resource Use Analysis

In SY 2018-19 the Legislative Model generated 282.3 central office administrative positions, while districts employed 17.2 more central office administrators for a total of 299.5 Twenty-nine districts employed more central office administrators than allocated, while 15 employed fewer, and three districts employed the same number as the model generates. In addition, the districts employed 321.3 central office classified staff, 21.4 more than the 321.3 allocated through the

Legislative Model. Three districts hired the same number of classified staff generated through the model, while 20 employed more and 24 fewer.[35]

In 2018-19 districts were allocated $33.9 million for central office non-personnel costs and spent just under $5 million more than that, or $38.8 million.[36]

PJ Panel Comments on Central Office

Virtually all of the discussion surrounding central office staffing focused on the staffing for small districts, with panelists asking why the EB model recommended further staff reductions. Discussions with superintendents and business managers of districts with fewer than 500 students, 1,000 students and between 2,000 and 4,000 students suggested that their central office staff positions were close to the EB model recommendations. The identified differences in staffing were in positions that were either funded through reimbursement components of the funding model (special education and transportation) or were food services administrative staff who theoretically should be paid for out of self-funded food services budgets (see element 25 below for discussion of food services). When those adjustments are made, staffing in smaller districts appeared to be about at the level of the 2020 EB recommendations.

One important point made by many panelists, particularly those from small districts is the need for, and challenge of finding qualified IT professionals. There was uniform agreement that all districts regardless of size need at least a half time IT director to manage all of the computers, network connections, servers, software purchase and maintenance, and security required to operate the technology operations of school districts. There was little support for partnering with other school districts among the PJ panelists.

There was little discussion about the adequacy of the EB central office staffing for districts with 4,000 or more ADM.

Panelists also expressed concern with the level of funding for non-personnel resources. They indicated that costs in this area have increased substantially in recent years, noting in particular costs for property and casualty insurance, legal fees, financial and student management software, and in some instances the need to cover deficits in the food services budget. Participants from larger districts described increasing limitations on the insurance they could purchase noting higher deductibles and limits on the number of claims for items like damaged roofs in any single year. They indicated that over time this has required them to increase the size of their own reserves to manage these property losses. There was a general consensus that if the per pupil amount for non-personnel resources were increased by 10 percent and adjusted by an ECA annually, funding would be adequate at the present time.

[35] Source: WDE CRERW, Table, sfp_crerw_appendix_e
[36] Source: WDE CRERW, Table sfp-crerw_expend_analysis_table8_1-22-2020

2020 Evidence-Based recommendation

Central Office Personnel:

- 500 or fewer ADM: 2.5 administrative and 2.0 classified positions, assuming the district is organized with one elementary and one secondary school
- 1,000 ADM: 3.0 administrative and 4.0 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM
- 2,000 ADM: 4.0 administrative and 8.0 classified positions. Position counts prorated down linearly between 2,000 to 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, and
- Position counts prorated up linearly above 12,000 ADM.

Non-Personnel Resources

Provide an amount equal to $400 per ADM for non-personnel resources and continue to increase it annually by the ECA.

24. Transportation

Transportation covers three possible transportation activities: 1) transportation of students to and from school, 2) transportation for student activities including field trips and sports, and 3) special education transportation.

2015 EB Model	Legislative Model	2020 EB Model	Cost Difference
100 percent state reimbursement.	100 percent state reimbursement.	100 percent state reimbursement.	None

Evidence and Analysis

Wyoming's school funding formula is unique among the states. It provides for 100 percent reimbursement of expenses to the district for all transportation related costs. These include costs associated with:

- Home to school to home of regular education students for those who live more than a mile from school
- Home to school to home of special education students
- Student field trips
- Student activity transportation
- Summer school transportation.

It also reimburses the district for ancillary costs associated with transportation such as maintenance, bus purchases, etc. The formula does provide certain benchmarks for how many miles a bus must be driven before it can be replaced, however.

This 100 percent reimbursement model is unique in that other states do not reimburse all the costs associated with transportation but rather use a formula that reimburses the district for part of the cost of transporting the student. Usually these formulas include a calculation of cost per mile for some, but not all of the categories above. Most states do not reimburse transportation expense at all for student activity (including sports transportation and student field trips). Some do not reimburse for summer school either. For the areas that the state does reimburse, other states rarely reimburse all the costs associated with student travel to school and home. They make the local district participate in part of the cost, assuming that by doing so provides an incentive for the local district to be as efficient as possible. However, in Wyoming there are no locally raised funds available for school districts so school districts would not be able to participate in the cost of transportation.

That leaves the question of whether the Wyoming system is designed to be efficient? While no school district would want to willingly be inefficient in providing student transportation, the reimbursement formula provides little incentive for the district to monitor transportation expense.

What then can be done to provide some sort of check on transportation costs for students? There are a couple of options or approaches that could be tried to interject a degree of efficiency into the system. First, the state could provide oversight on transportation expenses with a more robust auditing system requiring school districts to seek permission from the state for reimbursable expenses prior to initiating those expenses. This system could include:

- Requiring all districts to use routing software and submit those routes to the state for approval prior to the start of the school year.

- Tiering buses where appropriate. Students riding to school on separate grade level busses is the most expensive way to provide home to school transportation. The state could require districts to run each bus two or three times to reduce the number of busses and drivers to service the district. This would require the district to have different start and end times for each school level.

- Only reimbursing for the athlete’s transportation to and from activities. Any other transportation for the student body would require the students to pay for the cost of the transportation.

- For students in isolated areas, reimbursing parents to provide the transportation rather than sending a bus long distances to pick up one or two students. Currently, there is the ability to reimburse parents in Wyoming for this type of transportation, but it has restrictions on it that inhibit its use. Specifically, residents of very remote locations must prove an economic reason for living in that location to qualify to receive funding to transport their children to school. Absent an approved economic reason, the district is responsible for the transportation of students in those locations.

The second approach could include a more comprehensive study of transportation costs and provide limits on how much could be reimbursed to the district. Other states use this approach, with Texas being the most recent to adopt this approach. However, in all these other states, if the formula is off somewhat from the actual cost then the school district picks up the additional cost from other locally raised funds. In the case of Wyoming, the only place that a school district can go to offset expenses is to draw funds from the block grant. In that case transportation would be removing monies from the classroom.

Resource Use Analysis

Over the last fifteen years, total expenditures for transportation have more than doubled from a level of $33.5 million to $73 million. This expense accounting does not include capital outlay. It should be noted that during the two school years, 2017-18 and 2018-19, total transportation costs declined similar to the decline in student population. However, while total transportation costs declined in the those two years, costs for transporting for student activities continued to rise. Currently, about $8 million of the $73 million spent for transportation is for student activities, including sports.[37]

In 2018, the APA Recalibration Study (Augenblick, Palaich and Associates, 2018) included a detailed assessment of the expenditures for student transportation, with detailed analyses of costs, vehicles, miles driven and personnel expenditures. To create efficiencies in the provision of transportation services, APA recommended a linear density formula for funding to and from student transportation. The firm recommended no changes in the funding for activities. And the Legislature did not implement the recommendation to shift to a funding formula for transportation.

PJ Panel Recommendations

There was relatively little discussion of pupil transportation at the Professional Judgment panels. Panelists were supportive of the reimbursement model but expressed concern that they receive funding for one year in the following year. If transportation costs increase from one year to the next, there is a lag in receiving those additional funds. A more critical issue may be the impact of reduced transportation operations in 2019-20 due to school closures for the COVID-19 pandemic and the potential for additional closures in 2020-21. This is considered in the EB recommendation below.

2020 Evidence Based Recommendation

We recommend that for the foreseeable future, the state continue with the 100 percent reimbursement of all to and from school student transportation costs (regular and special education) as well as student activities transportation costs. In both instances, a formula-based funding mechanism – even though focused on creating efficiencies in operations – is likely to

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[37] https://portals.edu.wyoming.gov/Reports/(S(khjf1fivfkir3c3n5irygxng))/Public/wde-reports-2012/finance/transportation

create winners and losers in terms of funding allocations, as the APA formula did, and would also require a lengthy transition period to account for the difference in funding allocations. Moreover, any plan that requires local districts to "share" in the costs of transportation creates challenges for districts that do not have independent sources of revenue. Since general fund resources are generated through the Block Grant model, shortfalls in transportation funding will force districts to take funds from other areas. While this is common practice in shifting funds among alternative approaches to providing educational services, we do not think shifting those funds to pupil transportation shortfalls will lead to improvements in student learning.

The state also needs to consider whether existing school district reserves are adequate to address the impact of school closures due to the COVID-19 pandemic on future transportation reimbursement funding. Transportation expenditures for both to-and-from school and for activities/sports have likely been lower for 2019-20 than anticipated or projected due to school closures. As a result, if schools return to normal operations in 2020-21 and transportation expenditures return to their previous levels, the reimbursements based on 2019-20 may be inadequate to meet actual 2020-21 costs. If schools close again for long periods of time in 2020-21, lower actual expenditures will continue this pattern forward another year. Therefore, we recommend that the state identify mechanisms to help districts work through this financial challenge. Options include allowing districts to use reserve funds in the short term for transportation funding, paying some transportation costs in the current year rather than the year after, or establishing a short-term loan program to assist districts with any cash flow challenges.

25. Food Services

The EB and Legislative Models assume a school district's food service program is a self-supporting function. Consequently, no additional resources are provided for food service programs in the EB Model. However, Wyoming school districts currently spend over $11 million more for school food services than they collect in meal charges and federal and state subsidies. These dollars were transferred from the block grant to food service.

It is important to note that since COVID-19 the Federal Government has been providing free meals for students. As a result, in SY 2019-20 and 2020-21 districts have received substantial federal subsidies beyond those that would qualify under the FRL program. We are not able to predict how long this subsidy will continue.

2015 Evidence-Based Recommendation	**Legislative Model (Current Law)**	**2020 Evidence-Based Recommendation**	***Estimated Staff FTE Difference**
Assumed to be self-supporting but if Legislature seeks to subsidize food services it should be on a meal times rate basis	Assumed self-supporting	Assumed to be self-supporting	None

Analysis and Evidence

Although the Legislative Model assumes food services to be self-supporting, in SY 2018-19 Wyoming school districts spent $11.5 million more for food services than they received through Federal and state subsidies and meal sales. Table 3.25.1 shows the transfers from the general fund by school district for each district by school year since SY 2013-14. The table shows that general fund subsidies have increased by about $1.7 million across the state in that time, from $9.8 million to $11.5 million. In SY 2018-19 five districts did not report food services subsidies. Among the remaining 43 districts, subsidies ranged from a low of $38,000 in Hot Springs #1, to a high of $1.64 million in Campbell County #1.

Table 3.25.1 School District Food Services Transfer from the General Fund, SY 2013-14 to SY 2018-19

	Food Services Transfer from General Fund ($)					
District	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Albany #1	245,511	405,798	471,180	417,455	420,643	151,855
Big Horn #1	100,000	125,000	155,000	176,344	100,000	110,000
Big Horn #2	59,000	102,100	104,000	73,358	75,871	111,963
Big Horn #3	135,000	120,000	125,000	75,000	90,000	88,000
Big Horn #4	60,000	60,000	80,000	80,000	60,000	80,000
Campbell #1	615,315	820,000	1,309,714	1,230,000	1,057,651	1,641,679
Carbon #1	150,000	350,000	225,000	500,000	275,000	537,505
Carbon #2	188,000	175,000	180,000	240,000	250,000	250,000
Converse #1	186,000	206,400	240,000	225,581	265,000	315,000
Converse #2	150,000	150,000	150,000	100,000	68,000	75,000
Crook #1	200,000	285,000	250,000	250,000	250,000	250,000
Fremont #1	189,932	304,910	145,480	135,822	141,710	171,521
Fremont #2	123,303	127,131	98,402	126,802	109,507	84,759
Fremont #6	117,299	100,000	110,000	115,000	110,000	125,500
Fremont #14	550,000	450,000	450,000	576,478	400,000	400,000
Fremont #21	327,303	420,000	420,000	420,000	401,522	450,000
Fremont #24	118,000	125,000	120,000	193,000	120,000	100,000
Fremont #25	245,000	245,000	201,000		190,000	244,000
Fremont #38	500,000	420,000	400,000	450,000	261,068	450,000
Goshen #1	200,000	200,000	200,000	200,000	300,000	
Hot Springs #1	90,000	99,000		37,000	30,000	38,000
Johnson #1	410,000		60,000	100,000		200,000
Laramie #1	1,700,000	1,400,000	1,400,000	1,400,000	1,382,672	1,327,622
Laramie #2	81,077	63,310	117,353	106,232	100,475	112,526
Lincoln #1	84,500	83,000	75,000	75,000	75,000	90,000
Lincoln #2	118,479		129,478			

	Food Services Transfer from General Fund ($)					
District	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Natrona #1	827,000	1,269,000	1,269,000	1,364,000	1,030,000	1,000,000
Niobrara #1	100,000	35,000	85,000	100,000	100,000	100,000
Park #1						
Park #6	100,000	100,000	87,229	125,000	171,087	100,000
Park #16	62,185	92,168	91,638	61,976	67,890	67,557
Platte #1	190,000	215,000	190,000	190,000	240,000	240,000
Platte #2	55,000	55,000	60,000	45,000	45,000	75,000
Sheridan #1	80,000	209,787	224,373	178,611	160,716	169,474
Sheridan #2	45,000	110,000	110,000		110,000	125,000
Sheridan #3	79,500	75,000	70,000	50,000	155,000	
Sublette #1	124,999	100,000	225,000	225,000	185,894	160,000
Sublette #9	200,000	255,000	230,000	210,000	180,000	175,000
Sweetwater #1					193,990	385,430
Sweetwater #2	205,992	225,000	263,000	260,000	269,664	376,117
Teton #1	127,908	127,908	202,908	202,908	70,000	
Uinta #1	196,297	408,555	402,019	362,777	605,415	364,514
Uinta #4	94,000	90,000	95,000	100,000	450,000	190,000
Uinta #6	112,000	112,000	112,000	112,000	112,000	112,000
Washakie #1	150,295	150,690	175,835	201,210	226,195	236,317
Washakie #2	55,000	60,000	70,000	70,000	70,000	70,000
Weston #1	40,000	55,000	70,000	40,000	25,000	65,000
Weston #7	60,000	70,000	75,000	80,000	95,000	90,000
State Total	9,848,894	10,651,758	11,324,609	11,281,554	11,096,971	11,506,339

Source: WDE data provided to consultants

In the 2015 recalibration, we identified similar transfers to food services programs among school districts. We developed a complex formula to provide a state categorical grant to subsidize school district food service costs if the Legislature wanted to adopt a formula to supplement these costs. To estimate the potential categorical grant subsidy, we took the number of paid meals (meals purchased by students not eligible for free and reduced price meals), estimated what the full federal subsidy would be for those meals if the students were eligible for free meals, and then compared that to what each district received for a paid meal including federal funding subsidies, federal food commodity effective subsidy (the value of federally provided food per meal) and the price paid for each paid meal. We then subtracted the difference from the data showing the district provided subsidy and the remaining balance, if any, represented the amount of the proposed categorical grant.

The categorical grant model we developed ended up providing a varied share of the subsidy to each district. Specifically, for SY 2014-15 we estimated that the categorical program would fund about half (52.2 percent) of the general fund food service transfers among the 40 districts that were subsidizing food services, but it ranged from a low of zero to a high of 89.4 percent of the general fund transfer. We do not believe the distribution would differ materially today.

Another challenge that remains in developing a categorical reimbursement model for food services is local control. Based on comments from our Professional Judgment Panels, school districts make a number of choices as to how to prepare food, what types of food to purchase (organic, fresh, etc.) and what price to charge. While such local control is an important Wyoming characteristic, establishing a state funding mechanism for any expenses beyond federal subsidies and locally charged prices creates a number of disincentives for school districts to search for market prices for meals or to operate efficiently.

2020 Evidence-Based recommendation

Our recommendation remains the same as in previous years that food services programs should be self-supporting. A meal and rate model similar to what we estimated five years ago would still have the same uneven distribution, which only leaves the possibility of straight reimbursements for general fund subsidies to from district general funds. This would create disincentives for efficiency for a service that is consistently pays for itself in districts throughout the country. We also recommend investigating and implementing a standardized accounting system for school food service programs in order to obtain more consistent data.

RESOURCES FOR STRUGGLING STUDENTS

The staffing for core programs section contains positions for supporting teachers and students beyond the regular classroom teacher. Those positions include elective or specialist teachers, core tutors, instructional facilitators, substitute teachers, core guidance counselors, nurses, supervisory aides, librarians, library aides, school computer technicians, school administrators and school secretarial and clerical staff.

In many instances, additional support for struggling students is needed. The programs described in this section extend the learning time for struggling students in focused ways. The key concept is to implement the maxim of standards-based education reform: keep standards high for all students but vary the instructional time to give all students multiple opportunities to achieve to proficiency levels. The EB Model elements for extra help are also embedded in the RTI schema described at the beginning of this chapter.

It is important to note the Legislative Model uses two specific counts of pupils to define struggling students to generate these resources. For consistency purposes, we use these same counts for the EB Model to compare resources between the two Models. Wyoming Statute and WDE rules and regulations provide the specifics on how these counts are generated, but in general they are defined as:

1. At-risk count: defined as the unduplicated count of students eligible for free and reduced-price lunch, ELL students and mobile students in grades 6-12
2. ELL count: The number of students defined as ELL.

It should be noted that the Wyoming at-risk pupil count includes all ELL students, so all of the resources triggered by the number of at-risk students provide extra resources for ELL students, as well as non-ELL students from poverty backgrounds and secondary students who are mobile.

The EB Model provides substantial additional resources for struggling students (as indicated by at-risk pupil counts): tutors, pupil support, summer school and extended day programs, additional teaching staff for ELL students and staff for alternative learning environment schools. These resources for struggling students should be viewed in concert with resources for students with identified disabilities. Districts sometimes over identify students for special education services as the "only" way to trigger more resources for some struggling students. The EB Model's goal in providing a robust set of resources for struggling students is to provide adequate resources for all struggling students, with or without a diagnosed disability, and to reduce over time any over identification of students with disabilities.

This section includes discussion of seven categories of services: at-risk tutors, at-risk pupil support, extended day programs, summer school programs, ELL teachers, alternative schools and special education. Remember, that ELL students trigger the tutors, pupil support, extended day and summer programs, as well as the additional ELL resources.

26. At-Risk Tutors

The first strategy to help struggling students is to provide additional support for struggling students as described in Element 8 above. In addition to the one core tutor position provided to every prototypical school discussed above for Element 8, the EB Model provides additional tutor/Tier 2 interventionist positions at the rate of one for every 125 at-risk students.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
Provide 1.0 tutor position for every 125 at-risk students.	Provide 1.0 tutor position for every 100 at-risk students. Not provided for small or alternative schools.	Provide 1.0 teacher tutor position for every 125 at-risk students.	-58 At-Risk Tutor FTEs **Total cost estimate provided above in element 8** *Note: Net increase in total tutors of 131 FTEs, when accounting for both Core (Element 8) and At-Risk tutors (Element 26). EB Model generates 302.6 core tutors and 287.6 at risk tutors.*

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Refer to Element 8 for an explanation of analysis and evidence surrounding the use of tutors, including evidence about the use of instructional aides in place of certificated teachers in these important support roles for struggling students.

In 2015, the EB Model recommendation changed to include one *core* tutoring position for each prototypical school based upon a school's ADM and irrespective of the number of at-risk students. Additional tutoring resources were then generated based on a school's at-risk count at the rate of one additional tutoring position for every 125 at-risk students, with no minimums. The effect of this change in the EB Model was to increase the number of tutor positions at a school. Under the Legislative Model, a prototypical school with 125 at-risk students receives 1.25 tutor positions, whereas under the 2015 EB Model recommendation that prototypical school would receive the core tutor based on the school ADM, *plus* an additional 1.0 at-risk tutor position due to the 125 at risk students (in the case of a prototypical sized school that would be 2.0 tutor positions). The difference is that under the Legislative Model, the minimum tutor positions are part of the FTE generated by the at-risk student count, whereas under the 2015 EB Model recommendation, the core tutor position is *in addition to* the resources generated through the at-risk count.

During the 2015 recalibration process, there were discussions regarding the effectiveness of using instructional aides rather than certified tutors. Based upon the WDE's analysis, we know school districts employed 249.1 fewer certified tutors than the Legislative Model provided in SY 2013-14. The Legislative Model provided 381.1 tutoring positions and school districts employed 131.0. At that time, school districts tended to use instructional aides for tutoring rather than certified teacher tutors. The WDE's data show school districts employed 196.9 more aides than the Legislative Model provides.[38]

To provide more background on these instructional aides, in early summer 2015 the WDE surveyed school districts on their use of instructional aides. Five questions were asked regarding the use of instructional aides:

1. What is the number (FTE) of non-special education instructional aides employed at your district who are funded from general fund dollars?
2. How many instructional aides at your district have gone through intensive tutor training or professional development?
3. What professional development programs or qualification requirements are utilized?
4. Please provide additional information on instructional aide requirements.
5. Additional comments related to instructional aides.

Though only 38 of 48 school districts responded to the survey, there were several key findings that gave insight into the use of instructional aides. First, districts reported hiring approximately

[38] Source: CRERW Table sfp_crerw_appendix_d

570 non-special education aides from general fund resources for SY 2014-15. Second, districts reported use of a wide variety of approaches to select instructional aides and determine whether they were "highly qualified" or certified. The most common strategies used by the districts included the ETS Para Pro Certification system, a requirement the aide have two years of study at a community or other college, and/or the aide meets a standard of quality established by the district that included assessment of math, reading and writing. Third, school districts reported 671 instructional aides were trained in a tutoring program or related professional development. These numbers suggest districts used instructional aides extensively and reported that they trained them in tutoring skills or tutoring programs.

These findings suggest districts have a strong preference for use of instructional aides to providing tutoring and/or Tier 2 intervention help to struggling students. The EB Model perspective is that certified, skilled teacher tutors have the largest impact on boosting the learning of struggling students. The research shows certified teachers have twice the impact of selected, trained and supervised instructional aides used as tutors. The EB Model perspective also is that certified teachers should be used to provide extra help to struggling students that are in the lower portions of the achievement distribution, around the bottom third, but trained and supervised aides could be used for students with less complex learning needs. At that time or the last recalibration, district service strategies were heavily biased towards instructional aides, although the EB Model supports a greater reliance on certified teachers. This perspective on using licensed teachers rather than paraprofessionals to provide extra academic help to struggling students is shared by the District Management Group, which conducted the special study of services for special education students in Wyoming, and stated that using paraprofessionals to provide academic help to students is not a very effective educational strategy.

Resource Use Analysis

Refer to Element 8 for an explanation of the resource use analysis surrounding the use of tutors and Element 11 for the use of aides. The CRERW files do not allow us to separate aides hired with resources generated through the core model and resources generated from the struggling student component of the EB or Legislative Model.

PJ Panel Comments on Core (and At-Risk) Tutors

Note that because the Legislative Model allocates most of the tutors to districts through the at-risk tutor computation, and the EB model allocates substantially more tutors, many more through the minimum number of tutors than the Legislative Model, the comments from PJ panelists were often combined between core tutors and at-risk tutors. Comments here reflect panelists views regarding tutors generally.

Overall, there was strong support for tutors, and panelists felt there should be more tutors. In many instances, schools and districts provide tutoring services with Title I funds, which because they are provided by the Federal government are not included in the EB or Legislative Models. Panelists. Laramie County #1 representatives indicated that tutors were funded with Title I only, while in Natrona, respondents indicated that each school received one tutor with state/local resources and many schools had additional tutors funded with Title 1.

Some districts simply did not have tutors or spread them across multiple schools and then expressed concerns about "windshield" time rather than time spent with students. A few districts indicated that tutor positions were used to help ELL students because they felt that ELL funding component of the model was insufficient for their programs, even though ELL students trigger tutors, extra pupil support, and summer and extended day staff in addition to just ELL staff.

Several panelists said that they used instructional aides for tutors as they were more cost effective in their view, although none of those panelists were aware of whether or not the aides were highly trained as the evidence above suggests is necessary for success.

Overall, PJ panelists confirmed that there are likely many fewer tutors in schools than funded by the model, and universally argued that more tutors were needed.

2020 Evidence-Based recommendation

Provide one at-risk teacher tutor/Tier 2 interventionist position for every 125 at-risk students. It is important to note that the EB model allocates these at-risk tutor positions above the core tutor positions generated at each prototypical school whereas under the Legislative Model, the number of minimum tutors generated by each school is subtracted from the number of at-risk tutors.

27. Pupil Support

Core pupil support positions for school counselors and nurses are discussed in Element 10. At-risk students, however, generally have more non-academic needs that must be addressed by additional pupil support staff, which include additional school counselors, as well as social workers, family liaison staff, and psychologists. Complementing the core school counselor and nurse positions, the EB Model provides additional pupil support positions at the rate of one position for every 125 at-risk students.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 1.0 at-risk pupil support position for every 125 at-risk students.	Provide 1.0 at-risk pupil support position for every 100 at-risk students. Not provided for small or alternative schools.	Provide 1.0 at-risk pupil support position for every 125 at-risk students.	-88 FTEs -$6.9 million (75%) -$4.4 million (85%)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

At-risk students tend to have more non-academic needs that schools should address. This usually requires interactions with families and parents as well as more counseling in school. The greater the concentration of at-risk students, the more intensive these family and student outreach efforts need to be. The EB Model addresses this by providing additional pupil support staffing resources based on at-risk student counts.

Various comprehensive school designs have suggested different ways to provide more intensive family and student outreach programs (Stringfield, Ross, & Smith, 1996; for further discussion, see Brabeck, Walsh, & Latta, 2003). In terms of level of resources, the more disadvantaged the student body, the more comprehensive the strategy needs to be.

Although there are many ways schools can provide outreach to parents or involve parents in school activities – from fund raisers to governance – research shows school sponsored programs that have an impact on achievement address what parents can do at home to help their children learn. For example, if the education system has clear content and performance standards, programs that help parents and students understand both what needs to be learned and what constitutes acceptable standards for academic performance have been found to improve student outcomes. Parent outreach that explicitly and directly addresses what parents can do to help their children be successful in school, and to understand the standards of performance that the school expects, are the types of school-sponsored parent activities that produce discernible impacts on students' academic learning (Steinberg, 1997).

At the secondary level, the goal of parent outreach programs is to have parents learn about what they should expect of their children in terms of course taking and academic performance. If a district or a state requires a minimum number of courses for graduation, such as Wyoming's high school graduation and Hathaway scholarship requirements, those requirements should be made clear. Any differences between the two also should be addressed. If either an average score on end-of-course examinations or a cut-score on a comprehensive high school test are required for graduation, they too should be discussed. Secondary schools need to help parents understand how to more effectively assist their children in identifying an academic pathway through middle and high school, understand standards for acceptable performance, and be aware of the course work necessary for high school graduation and college entrance. This is particularly important for parents of students in the middle or lower end of the achievement range, as often these students know very little of the requirements for transition from high school to postsecondary education (Kirst & Venezia, 2004).

At the elementary level, the focus for parent outreach and involvement programs should concentrate on what parents can do at home to help their children learn academic work for school. Too often parent programs focus on fund raising through parent-teacher organizations, involvement in decision making through school site councils, or other non-academically focused activities at the school site. Although these school-sponsored parent activities might impact other goals – such as making parents feel more comfortable being at school or involving parents more in some school policies – they have little effect on student academic achievement. Parent actions that impact student learning would include: 1) reading to them at young ages, 2) discussing stories and their meanings, 3) engaging in conversations with open ended questions, 4) setting aside a place where homework can be done, and 5) ensuring that their child completes all homework.

The resources in the EB and Legislative Models are adequate to create and deploy the ambitious and comprehensive parent involvement and outreach programs that are part of two comprehensive school designs: Success for All Program and the Comer School Development Program. The Success for All Program includes a family outreach coordinator, a nurse, a social worker, a counselor and an education diagnostician for a school of about 500 students. This group functions as a parent outreach team for the school, serves as case managers for students who need non-academic and social services, and usually includes a clothing strategy to ensure all students, especially in cold climates, have sufficient and adequate clothes, and coats, to attend school.

The Comer School Development Program was created on the premise of connecting schools more to their communities. Its Parent-School team has a somewhat different composition and is focused on training parents to raise expectations for their children's learning, to work with social service agencies and to work with the school's faculty to raise their expectations for what students can learn. Sometimes the team co-locates on school site premises to provide a host of social services. The need for robust family outreach programs and the efficacy of the Comer designed School Development Program was reinforced by Linda Darling Hammond and colleagues (2019) who argued that the program is as relevant today as when it was created in the late 1990s.

A program called Communities in Schools (www.communitiesinschools.org), which now operates in 26 states and the District of Columbia, and can be resourced by the additional staffing provided by this element, has been successful in raising school attendance rates as students need to attend school in order to learn. The program adds a caseworker, often trained in social work, to a school's pupil support team to help match social services provided by non-educational agencies to students who need them. KIPP Charter schools also have robust parent involvement strategies, which also can be supported by these extra pupil support resources.

These additional pupil support staff can also be used to provide some of the mental health services Wyoming educators increasingly argue many students need. At the Professional Judgment Panels we conducted in Wyoming in 2015 and in Professional Judgment Panels we have conducted in Vermont, Maryland and Michigan since that time and again in Wyoming this year, one of the overwhelming findings in all states has been the increasing need for more staff to meet the social and emotional needs of students and their families. The onset of the COVID-19 pandemic and the changes required to maintain personal physical and mental health are likely to further increase the need for school staff to help students and their families cope with a wide range of challenges, including mental health challenges.

Resource Use Analysis

Refer to Element 10 for an explanation of the resources use analysis surrounding the use of pupil support staff. The CRERW files do not allow us to disaggregate staff hired with resources generated through the core model and resources generated through the at-risk student component of the EB or Legislative Model.

PJ Panel Comments on At-Risk Pupil Support

The PJ panel discussions on this issue were combined with the discussions related to counselors and nurses. The findings from the PJ panels on this topic are repeated here for reader convenience.

During our PJ Panel meetings with Wyoming educators, we heard nearly everyone express the need for more pupil support staff, including significantly more resources to address the health and mental health needs of Wyoming's school children. Wyoming educators, who stated in 2015 that students needed enhanced mental health services, were particularly aware in 2020 of the loss of mental health services for students due to the state's reduction of mental health resources in non-education agencies as well as cuts to the Child Development Centers.

There was nearly universal support for additional counselors, along with a feeling that the category should be called "counselors" not "guidance counselors" as individuals in these positions provided much more than simply counseling about school programs, college and careers – the traditional role of a "guidance" counselor. Participants felt strongly that more counselors, social workers and psychologists were needed due to the increasing social and emotional needs of students in recent years. Several expressed concern over the impact of the COVID pandemic on student (and family) mental health and most felt that the end of the pandemic would not necessarily end the issues that have begun to surface.

Participants also felt the funding model needed to include nurses – and pointed to the number of districts that employed nurses even in the absence of direct funding of them by the legislative model. They described the growing need to provide medications for students during the school day and expressed concern about the district's liability if clerical staff at schools dispensed medicines in lieu of a trained nurse.

A number of participants stated that "there should be a counselor in every school building in the state" and several also stated there should be a nurse in every building as well. Many indicated that these should be full time positions.

2020 Evidence-Based recommendation

Provide one at-risk pupil support position for every 125 at-risk students.

28. Extended-Day Programs

At both elementary and secondary school levels, some struggling students are likely to benefit from after-school or extended-day programs, even if they receive tutoring or other kinds of Tier 2 interventions during the regular school day.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.**	For both extended-day and summer school programs, funding was rolled into the block grant and provides 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 upon the district's at-risk count. In 2017, the funds remained the same but were "rolled into" the block grant and are no longer a categorical program.	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.**	212.5 FTE $13.0 million (75%) $15.6 million (85%)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.
**This formula equates to funding for one teacher position for every 30 at-risk students or 4.0 teacher positions per 120 at-risk students, paid at the rate of 25% percent of a teacher's annual salary, enough to pay a teacher for a two-hour extended-day program, five days per week.

Analysis and Evidence

Extended-day programs provide environments for children and adolescents to spend time in school *after* the regular school day ends, but during the *regular school year*. Reviews of research found that well designed and administered after-school programs yield numerous improvements in academic and behavioral outcomes (Fashola, 1998; Posner & Vandell, 1994; Vandell, Pierce & Dadisman, 2005; Vandell et al., 2020). On the other hand, the evaluation of the 21st Century Community Learning Centers Program (James-Burdumy et al., 2005), though hotly debated, indicated that for elementary students, extended-day programs did not appear to produce measurable academic improvement. Critics of this study (Vandell, Pierce & Dadisman, 2005) argued the control groups had higher pre-existing achievement, which reduced the potential for finding program impact. Critics also argued the small impacts identified had more to do with the lack of full program implementation during the initial years than with the strength of the program. The research evidence on extended-day programs is somewhat mixed because of research methods (too few randomized trials), poor program quality, and imperfect implementation of the programs studied.

Nevertheless, multiple studies and research reviews have documented positive effects of extended-day programs on the academic performance as well as behavioral outcomes of students who participated in select after-school programs (e.g., Takoata & Vandell, 2013: Vandell, 2014; Vandell, Pierce & Dadisman, 2005; Vandell et al., 2020; Wu, 2020). Magana, Saab, and Svoboda (2016-17) provide an example of how an extended day school program was critical to turning around a low performing middle school in Denver.

In a comprehensive review of research on a wide range of organized activities for children, including both after school programs as well as extra-curricular activities, Vandell et al. (2015) focused on various aspects of the organized activities, specifically their type, breadth, intensity, duration, consistency, and quality as "main effects" in relation to academic and social outcomes, finding that outcomes of *afterschool programs* were a function of both the intensity and duration of a young person's participation, with some evidence of larger effects when program quality was also high. Vandell and colleagues concluded that:

> "A growing body of controlled longitudinal research, employing robust measures, has documented [the following] types of effects of organized activities on children's development. First, participation in afterschool programs—activities that meet on a regular basis throughout the school year and provide a variety of hands-on, structured experiences with peers and adults—predicts a wide range of child developmental [social, emotional] outcomes, including students' self-perceptions (self-esteem, identity, self-efficacy), bonding to school, positive social behaviors, noncognitive skills (persistence, teamwork, emotional regulation) as well reductions in problem behaviors such a truancy, substance use, and delinquent acts. Participation in afterschool programs also has been linked to academic outcomes, including math and reading achievement and school grades.
>
> Participation in extracurricular activities—activities that meet regularly but focus on a single activity – similarly predicts academic grades, school bonding, noncognitive skills like persistence and work habits, self-esteem, psychosocial adjustment, and reductions in antisocial behaviors and truancy.
>
> The similarity in findings from these two bodies of research (extracurricular activities and afterschool programs) supports the use of the more inclusive term, organized activities, to represent both types of activities [and their impacts on students]."

In other words, after school, extended day programs, (as well as other extra-curricular activities including sports) can help improve student learning but it depends on multiple features of the programs, and the participation behaviors of students. In practical terms, program evaluators have identified several structural and institutional supports necessary to make after-school programs effective:

- Staff qualifications and support (staff training in child or adolescent development, after-school programming, elementary or secondary education, and content areas offered in the program; staff expertise; staff stability/turnover; compensation; institutional supports).

- Program/group size and configuration (enrollment size, ages served, group size, age groupings and child staff ratio).
- A program culture of mastery, i.e., engaging in activities to become more proficient and/or to meet various standards of performance.
- Consistent participation in a structured program.
- Financial resources and budget (dedicated space and facilities that support skill development and mastery, equipment and materials to promote skill development and mastery; curricular resources in relevant content areas; location that is accessible to youth and families).
- Program partnerships and connections (with schools to connect administrators, teachers and programs; with larger networks of programs, with parents and community).
- Program sustainability strategies (institutional partners, networks, linkages; community linkages that support enhanced services; long term alliances to ensure long term funding).

The EB Model includes resources for an extended-day program that can meet these structural supports for all school prototypes. The resources can be used to provide students in all elementary and all secondary grades with additional help during the school year, but *after* the normal school day, to meet academic performance standards. Because not all at-risk students will need or will attend an after-school program, the EB model provides extended day resources for half of the at-risk students in a school, a need and participation rate identified by Kleiner, Nolin, and Chapman (2004).

The EB model assumes that each extended day teacher serves 15 at-risk students each day for two hours and is paid an additional 25 percent of salary to meet with those students. The EB model also assumes half of the at-risk students will participate in the program, so a school with 120 at-risk students will receive funding for four individuals to serve 60 students in groups of 15 for two hours (25 percent FTE) a day. Simplified, the formula equates to one teacher position for every 120 at-risk students.

Resource Use Analysis

The CRERW report does not report expenditures or position counts for extended-day programs. Below we have summarized available data for extended programs through 2013-14 in one location and expenditures for these programs in later years separately due to changes in the WDE's data collection procedures.

Prior to 2016-17, districts received funding for both extended-day and summer school programs through a categorical grant called the Bridges Program. Funding was only provided to districts for actual costs incurred in providing these programs. According to information[39] provided by the WDE, the number of students enrolled in extended-day programs and the resources provided, increased for several years at least up to 2015. Table 3.28.1 provides data on expenditures from the Bridges Program and other funds used for extended day programs for SY 2005-06 through SY 2013-14.

[39] http://legisweb.state.wy.us/InterimCommittee/2015/SSRRpt0806Appendix17.pdf

Table 3.28.1 Extended-Day Expenditures and Enrollment in the Bridges Program, 2005-06 to 2013-14

School Year	Bridges Grant	Other Funds*	Total Expenditures	Total Enrollment in Extended Day Programs
2005-06	$839,233	$210,034	$1,049,267	3,498
2006-07	$2,302,920	$512,488	$2,815,408	5,735
2007-08	$2,265,284	$607,496	$2,872,780	5,476
2008-09	$367,431	$3,718,951	$4,086,382	4,988
2009-10	$3,086,448	$1,058,025	$4,144,473	7,536
2010-11	$3,592,966	$685,628	$4,278,594	8,339
2011-12	$4,022,537	$6,392,994	$10,415,531	9,880
2012-13	$4,034,491	$6,024,539	$10,059,030	9,470
2013-14	$4,232,229	$871,235	$5,103,464	11,868

*Some of these figures according to the WDE could not be verified.
Source: WDE report submitted July 10, 2015.

According to the WDE, in SY 2005-06, only 14 school districts used the Bridges Program for extended day programs. Each year the number of school districts providing extended day services increased and in SY 2013-14, 43 districts provided extended-day programs using the Bridges Program funding. However, the Bridges Program (including both summer school and extended-day) funding was between 30 and 33 percent of the EB Model's recommendations, and the extended-day and summer school programs funded by the Bridges Program served about 12,000 students or about one-third of the then 36,000 at-risk students in Wyoming.

Neither the enrollment data nor the separate expenditures for extended day programs in Table 3.28.1 are available after 2014-15. Moreover, in 2017, the Legislature rolled the Bridges funding into the block grant program. As a result, the Department of Education created a new function code (1265) to allow districts to designate expenditures for these programs from the general fund. Table 3.28.2 provides the data for expenditures for extended day and summer school programs combined for 2014-15 to 2018-19. The numbers show that expenditures for these two extra help programs dropped by nearly a half after being rolled into the block grant.

Table 3.28.2 Expenditures for Summer School and Extended Day Programs, 2014-15 to 2018-19

School Year	General Fund	Special Revenue Funds	Grand Total
2014-15		$ 13,127,960	$ 13,127,960
2015-16		$ 13,017,770	$ 13,017,770
2016-17	$ 222,600	$ 12,443,800	$ 12,666,400
2017-18	$ 6,250,667	$ 1,813,801	$ 8,064,468
2018-19	$ 6,540,372	$ 21,464	$ 6,561,836

PJ Panel Comments on Extended Day

PJ panelists strongly supported extended day programs. Virtually all indicated they have extended day programs, although the content of the programs seemed to vary from simply offering help with homework to more academically oriented approaches to helping struggling students for at least part of the time. Some of the smaller districts that have gone to four-day weeks use Friday as sort of an extended day program – some only provide services on Friday, others have both extended day and Friday programs.

Participants were split as to whether extended day should be a categorical program or remain in the block grant. Overall, more seemed to favor categorical programs, and all bemoaned moving it into the block grant where they were concerned that there was a loss of funding for extended day programs as funds were shifted to other programs.

2020 Evidence-Based recommendation

Provide one extended-day teacher position for every 120 at-risk students. The 2020 EB Model recommendation continues to include full funding for extended-day programs. This funding provides for one teacher position for every 30 at-risk students or 4.0 teacher positions per 120 at-risk students paid at the rate of 25 percent of a teacher's annual salary, enough to pay a teacher for a two-hour extended-day program, five days per week. We also recommend retaining these resources as a categorical program to ensure all such resources are spent on students struggling to achieve to rigorous academic standards.

29. Summer School Programs

Many students need extra instructional time outside of the regular school year to achieve the state's proficiency standards. Summer school programs should be part of the range of programs available to provide struggling students the additional time and help they need to achieve to standards and earn academic promotion from grade to grade (Borman, 2001). Providing additional time to help all students master the same content is an initiative that is grounded in research (National Education Commission on Time and Learning, 1994). It should be noted summer school services are provided outside of the regular school year.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.**	For both extended-day and summer school programs, funding in 2017 was rolled into the block grant and provides 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 upon the district's at-risk count.	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.**	212.5 FTE $13.0 million (75%) $15.6 million (85%)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.
**This formula equates to funding for one teacher position for every 30 at-risk students or 4.0 teacher positions per 120 at-risk students paid at the rate of 25 percent of annual salary, enough to pay a teacher for a six-week summer school program of six hours a day and allow time for preparation and grading.

Analysis and Evidence

Research dating back to 1906 shows students, on average, lose a little more than a month's worth of skill or knowledge over the summer break (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). Summer breaks have a larger deleterious impact on low income children's reading and mathematics achievement. This loss can reach as much as one-third of the learning during a regular nine-month school year (Cooper et al., 1996). A longitudinal study by Alexander and Entwisle (1996) showed these income-based summer learning differences accumulate over the elementary school years, such that poor children's achievement scores – without summer school – fall further and further behind the scores of middle-class students as they progress through school grade by grade. As a result of this research, there is emerging consensus that what happens (or does not happen) during the summer can significantly impact the achievement of students from low-income and at-risk backgrounds, and help reduce (or increase) the poor and minority achievement gaps in the United States (see also Heyns, 1978).

Evidence on the effectiveness of summer programs in attaining either of these goals is mixed. Although past research linking student achievement to summer programs shows some promise, several studies suffer from methodological shortcomings and the low quality of the summer school programs themselves (Borman & Boulay, 2004).

A meta-analysis of 93 summer school programs (Cooper, Charlton, Valentine, & Muhlenbruck, 2000) found the average student in summer programs outperformed about 56 to 60 percent of similar students not receiving the programs. However, the certainty of these conclusions was compromised because only a small number of studies (e.g., Borman, Rachuba, Hewes, Boulay & Kaplan, 2001) used random assignment, and program quality varied substantially.

Randomized controlled trial research of summer school reached more positive conclusions about how summer programs can positively impact student learning (Borman & Dowling, 2006; Borman, Goetz & Dowling, 2009). Roberts (2000) found an effect size of 0.42 in reading achievement for a randomized sample of 325 students who participated in the Voyager summer school program. A 2016 randomized control trial of summer school, found that summer programs that focused on academics, provided small classes of 15, and lasted for several weeks, produced significant positive impacts on elementary student academic achievement (Augustine, et al., 2016). Not surprisingly, the study found that students who attended these summer programs for longer times experienced larger gains in reading and math scores than students who attended for less than four weeks.

Browne (2019) found that voluntary summer school programs in five large districts, with class sizes of 15 and that provided both academics and enrichment, increased student test scores the next year 20-25 percent of the typical annual gain for frequent attenders but smaller gains for those students who were not frequent attenders. About 60 percent of program participants were frequent attenders. One implication, clearly, is to enhance strategies to get more students to attend summer school more often.

Researchers (see Browne, 2016-17; McCombs, et al., 2011; Pitcock & Seidel, 2015.) note several program components related to improved achievement effects for summer program attendees, including:

- Early intervention during elementary school
- A full 6-8-week summer program
- A clear focus on mathematics and reading achievement, or failed courses for high school students
- Small-group or individualized instruction
- Parent involvement and participation
- Careful scrutiny for treatment fidelity, including monitoring to ensure good instruction in reading and mathematics is being delivered, and
- Monitoring student attendance.

Summer programs that include these elements hold promise for improving the achievement of at-risk students and closing the achievement gap. A 2013 review of the effects of summer school programs reached this same conclusion (Kim & Quinn, 2013). Kim and Quinn's meta-analysis of 41 school- and home-based summer school programs found students in kindergarten through grade 8 who attended summer school programs with teacher directed literacy lessons showed significant improvements in multiple areas including reading comprehension. Moreover, the effects were much larger for students from low-income backgrounds.

A comprehensive book on the "summer slide," written by several of the analysts cited above, expands on the points outlined above. The book describes what is known about learning loss over the summer and what can be done to prevent it (Alexander, Pitcock & Boulay, 2016). The authors' suggestions for how to structure effective summer school programs echo the recommendations above.[40]

In sum, research generally suggests summer school is needed and can be effective for at-risk students. Studies suggest the effects of summer school are largest for elementary students when the programs emphasize reading and mathematics, and for high school students when programs focus on courses students failed during the school year. The more modest effects frequently found in middle school programs can be partially explained by the emphasis in many middle school summer school programs on adolescent development and self-efficacy, rather than academics.

Because summer school can produce powerful impacts, the EB Model provides resources for summer school for classes of 15 students, for 50 percent of all at-risk students in all grades K-12, an estimate of the number of students still struggling to meet academic requirements (Capizzano, Adelman & Stagner, 2002). The EB Model provides resources for a program of six-to-eight weeks in length with a six-hour day. This allows for at least four hours of instruction in core subjects. A six-hour day also allows for up to two hours of non-academic activities each day. The formula for staffing summer school programs equates to one teacher position serving 15 students and paid at 25 percent of annual salary or 4.0 FTE teachers per 120 at risk students (recall that only half or 60 of the 120 students are estimated to enroll in summer school). This position is paid at the rate of 25 percent of the annual teacher salary. Simplified, the formula equates to one full time teacher position for every 120 at-risk students.

As the discussion to this point shows, the EB Model's resources for at-risk students are a sequenced set of connected and structured programs that begin in the early elementary grades and continue through the upper elementary, middle, and high school levels. The EB model provides resources so that the most academically deficient at-risk students receive Tier 2 interventions that include tutoring, an extended-day program with an academic focus, a summer school program that is structured and focused on academics. ELL students receive all of these services *as well as* the additional ELL resources discussed in the next section.

Resource Use Analysis

The CRERW report does not report expenditures or position counts for summer school programs. Below we have summarized available data for extended programs through 2013-14 in one location and expenditures for these programs in later years separately due to changes in the WDE's data collection procedures.

[40] Lynch and Kim (2017) report that a randomized controlled trial of an on-line summer school program for mathematics had no impact on student learning but could not determine whether it was the on-line curriculum itself, or some other programmatic element – like monitoring of students engaging in the online instruction – that diminished the impact.

Prior to 2016-17, districts received funding for both extended-day and summer school programs through a categorical program called the Bridges Program. Funding was only provided to districts for actual costs incurred in providing these programs. According to information[41] provided by the WDE, the number of students enrolled in extended-day programs and the resources provided, increased for several years at least up to 2015. Table 3.29.1 provides data on expenditures from the Bridges Program and other funds used for extended day programs for SY 2005-06 through SY 2013-14.

Table 3.29.1 Summer School Expenditures and Enrollment in the Bridges Program, 2005-06 to 2013-14

School Year	Bridges Grant	Other Funds*	Total Expenditures	Total Enrollment
2005-06	$5,036,376	$1,165,620	$6,201,996	7,389
2006-07	$5,325,553	$868,586	$6,194,139	7,533
2007-08	$4,207,205	$582,302	$4,789,507	7,366
2008-09	$5,797,516	$1,078,849	$6,876,365	8,982
2009-10	$6,953,633	$2,073,204	$9,026,837	9,545
2010-11	$8,523,972	$2,657,238	$11,181,210	10,031
2011-12	$8,437,909	$2,066,512	$10,504,421	9,855
2012-13	$9,076,598	$2,987,540	$12,064,138	10,827
2013-14	$9,697,438	$2,379,478	$12,076,916	12,344

*Some of these figures according to the WDE could not be verified.
Source: WDE report submitted July 10, 2015.

According to the WDE, in SY 2005-06, 40 school districts used the Bridges Program for summer school programs. All school districts provided summer school services in SY 2013-14 using the Bridges Program funding. However, the Bridges Program (including both summer school and extended-day) funding is between 30 and 33 percent of EB Model recommendations, and the extended-day and summer school programs funded by the Bridges Program serve near 12,000 students or about one-third of the total number of the 36,000 at-risk students across Wyoming.

Neither the enrollment data nor the separate expenditures for summer school programs in Table 3.29.1 are available after 2014-15. Moreover, in 2016, the Legislature rolled the Bridges funding into the block grant program. As a result, the Department of Education created a new function code (1265) to allow districts to designate expenditures for summer school and extended day programs from the general fund. Table 3.29.2 provides the data for expenditures for extended day and summer school programs combined for 2014-15 to 2018-19. The numbers, as we concluded for extended day, show that expenditures for these two extra help programs dropped by nearly a half after being rolled into the block grant.

[41] http://legisweb.state.wy.us/InterimCommittee/2015/SSRRpt0806Appendix17.pdf

Table 3.29.2 Expenditures for Summer School and Extended Day Programs, 2014-15 to 2018-19

School Year	General Fund ($)	Special Revenue Funds ($)	Grand Total ($)
2014-15		13,127,960	13,127,960
2015-16		13,017,770	13,017,770
2016-17	222,600	12,443,800	12,666,400
2017-18	6,250,667	1,813,801	8,064,468
2018-19	6,540,372	21,464	6,561,836

Source: Legislative Service Office

PJ Panel Comments on Summer School

PJ panelists supported summer school programs. Although there was less support for summer school than for extended day, overall panelists felt summer school was important to help struggling students succeed. There was substantial variation in the grade levels served, and also variation in the length of summer school programs. Several panelists noted that this summer (2020) their district was operating a summer school to help students catch up for time lost due to the COVID-19 pandemic shift to virtual school programs. Participants who commented on the funding approach to summer school generally favored a categorical program to ensure resources were allocated to summer programs.

2020 Evidence-Based recommendation

Provide one summer teacher position for every 120 at-risk students. The 2020 EB Model recommendation continues to include full funding for summer school programs. This funding provides for one teacher position for every 30 at-risk students or 4.0 teacher positions per 120 at-risk students paid at the rate of 25 percent of annual salary, enough to pay a teacher for a six-hour summer school program, five days per week for six-eight weeks. We also recommend retaining these resources as a categorical program to ensure all such resources are spent on students struggling to achieve to rigorous academic standards.

30. English Language Learner (ELL) Students

Research, best practices and experience show that ELL students need additional assistance to learn English, as well as content and language instruction in regular content classes. This can include some combination of small classes, Sheltered English for content classes, English as a second language classes, professional development for teachers to help them teach Sheltered English classes, and "reception" centers for districts with large numbers of ELL students who arrive as new immigrants to the country and the school throughout the year.

The EB Model provides resources for ELL teachers in addition to the at-risk resources for tutors, pupil support, extended day, and summer school for all ELL students using the ELL count. Specifically, the EB Model provides one teacher position for every 125 ELL students for tutoring, one teacher position for every 125 ELL students for extra pupil support, one teacher position for every 120 ELL students for summer school, one teacher position for every 120 ELL students for extended day programming, *and in addition*, one teacher position for every 100 ELL students for additional language support. Altogether, the model provides 4.46 teacher positions for every 100 ELL students or one teacher position for every 22.4 ELL students in addition to all core staffing resources. This represents a robust set of additional resources beyond core staff for ELL students.

2015 Evidence-Based Recommendation	**Legislative Model (Current Law)**	**2020 Evidence-Based Recommendation**	***Estimated FTE Staff Difference**
Provide 1.0 ELL teacher position for every 100 ELL students.	Provide 1.0 ELL teacher position for every 100 ELL students. Not provided for small or alternative schools.	Provide 1.0 ELL teacher position for every 100 ELL students.	No FTE Difference $0.02 million (75%) $0.33 million (85%)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Good ELL programs work, whether the approach is structured English immersion (Clark, 2009) or initial instruction in the native language, often called bilingual education. Bilingual programs have been studied intensively. A best-evidence synthesis of 17 studies of bilingual education (Slavin & Cheung, 2005) found ELL students in bilingual programs outperformed their non-bilingual program peers. Using studies focused primarily on reading achievement, the authors found an effect size of +0.45 for ELL students. A 2011 randomized controlled trial also produced strong positive effects for bilingual education programs (Slavin, et al., 2011), but concluded the language of instruction was less important than the approaches taken to teach reading.

Addressing the important issue of learning to read in *The Elementary School Journal,* Gerstein (2006) concludes ELL students can be taught to read in English if, as shown for monolingual students, the instruction covers phonemic awareness, decoding, fluency, vocabulary and reading comprehension, in other words, follows the current science of reading instruction discussed in Element 17. Gerstein's studies also showed ELL students benefit from instructional interventions initially designed for monolingual English-speaking students, the resources for which are included in the four at-risk student triggered programs: tutoring, extended-day, summer school and pupil support.

Bilingual education is difficult to provide in most schools today because students come from multiple language backgrounds and it is difficult to find teachers who are fluent in many languages represented by small groups of students. Consequently, most schools have adopted the Sheltered English approach. The EB Model also uses the Sheltered English model for estimating ELL resources in schools.   Brown University's Education Alliance Project defines sheltered instruction as an approach to teaching English language learners that integrates language and content instruction.   Sheltered instruction has two prime goals: 1) to provide access to mainstream, grade-level content, and 2) to promote the development of English language proficiency, including the academic language specific to the content area (The Education Alliance, 2020).

One specific sheltered English approach is the Sheltered Instruction Observation Protocol (SIOP) Model. SIOP is a research-based and validated instructional model that has proven effective in addressing the academic needs of English learners throughout the United States. The SIOP Model consists of eight interrelated components: lesson preparation, interaction, building background, practice and application, comprehensive input, lesson delivery, strategies and review and assessment (see Echevarria, Vogt, & Short, 2017 for more detail). Three studies by Short, Echevarria, and Richards-Tutor (2011) found that students with teachers who were trained in the SIOP Model of sheltered instruction and implemented it *with fidelity* performed significantly better on assessments of academic language and literacy than students with teachers who were not trained in the model, underscoring the importance of professional development in implementing this instructional approach. Further, Le and Polikoff (2020) found that schools that adopted specific English language development curriculum produced larger impacts on students' English proficiency, suggesting that English language development needs to be a structured and systemic aspect of instruction for ELL students.

In focus groups we conducted as part of EB studies in other states, many educators also argued that sheltered instruction represents high-quality and effective instruction and is effective not only for ELL students but also all students, and particularly non-ELL, at-risk students (e.g., Odden & Picus, 2018). This suggests developing Sheltered English instruction for all teachers can have the side benefit of improving the performance of all students, not just ELL students.

For Sheltered English instruction, districts and schools of education should provide professional development and training for the pedagogical skills needed by teachers to implement this approach. The EB Model has recommended the Sheltered English approach for over a decade and includes substantial professional development resources. Therefore, we believe districts and states have had sufficient time to provide this professional development and training.

Providing a classroom aide that speaks some of the languages of the ELL students does not result in improved student performance. And co-teaching classes with ELL students is not cost-based. Sheltered English programs, by being cost-based, supersede the practice in many districts of having two teachers provide instruction to a class of ELL students – one content knowledgeable teacher speaking English, and a second teacher who has expertise in the second language represented in the classroom, but often does not know the content. Co-teaching, moreover, is twice as expensive as Sheltered English Instruction, and even if it were effective would not be cost-based because of its high cost.

Beyond the most cost-effective general structure for providing instruction to ELL students, however, research shows ELL students need a solid and rigorous core curriculum as the foundation on which to provide both core instruction and any extra services (Gandara & Rumberger, 2008; Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003). This research suggests ELL students need:

- Effective teachers – a core goal of all the staffing in the EB Model.
- Adequate instructional materials and good school conditions.
- Good assessments of ELL students so teachers know in detail their English language reading and other academic skills.
- Less segregation of ELL students
- Rigorous and effective curriculum and courses for all ELL students, including college and career ready, and affirmative counseling of such students to take those courses.
- Professional development for all teachers, focused on sheltered English teaching skills as well as the content and pedagogical content knowledge needed for teaching any specific subject.

Torff and Murphy (2019, 2020) emphasize these important points by arguing that a major reason for the ELL achievement gap is that ELL students often are not offered a rigorous curriculum, even when it is recommended as appropriate. And when used, teachers often choose less rigorous activities and expectations when teaching ELL students. The result, not surprisingly, is lower ELL academic achievement. Tarff and Murphy argue there is a self-fulfilling prophecy: ELL students receive less than rigorous instruction, which limits their performance, which justifies the lower expectations, all the while non-ELL students receive more rigorous instruction and achieve at a higher level.

The solution, Torff and Murphy argue, is knowing the difference between the academic demands of a curriculum and the linguistic demands – and then for teachers to provide the linguistic supports that allow the ELL students to meet the same rigorous achievement standards as other, native English-speaking students. In part this is also the approach and goal of Sheltered English instruction. Teachers need to teach both academic content and the academic language that is part of that content, which is a more demanding challenge for ELL students. Intensive PD is needed to help teachers acquire these language support skills.

Hakuta (2011) supports these conclusions and notes that being taught the "academic language" linked to a content subject is critical to ELL students' learning to the new and more rigorous college and career ready standards. The new standards require more explicit and coherent ELL instructional strategies, including the content related academic language; today's more rigorous standards also require extra help services to ensure ELL students learn the subject matter, English generally, and academic English specifically, i.e., learn how to read and understand content texts in English. Providing all of this for ELL students requires smaller regular classes, something that is already provided by the Wyoming funding Model.

Additional teaching staff may also be needed to provide English as a second language instruction during the regular school day, such as having ELL students take English as a second language course in lieu of an elective course. Although the potential to eliminate some elective classes exists if there are large numbers of ELL students who need to be pulled out of individual classrooms, it is generally agreed that to fully staff a strong ELL program, each 100 ELL students should trigger one additional teaching position. This makes it possible to provide additional instructional opportunities for ELL students to provide an additional dose of English instruction. The goal of this programming is to reinforce ELL student learning of academic content and English so at some point the students can continue their schooling in English only.

Research shows ELL students from lower income and generally less educated backgrounds struggle most in school and need extra help to learn both academics, regular English and content-related academic English. The EB and Legislative Models address this need by ensuring the ELL resources triggered by ELL counts are in addition to other Tier 2 intervention resources including tutoring, pupil support, extended-day and summer school by providing one teacher position for every 100 ELL students.

Given this allocation of one teacher position for every 100 ELL students, it is important to understand that the EB Model provides all ELL students with additional language resources *as well as* tutoring, additional pupil support, extended day, and summer school. Put differently, for every 100 ELL students the comprehensive EB model provides 1.0 tutor, 0.8 pupil support, 0.83 extended day, 0.83 summer school and 1.0 ELL teacher positions, or 4.46 teacher positions for every 100 ELL students. In other words, every 22.4 ELL students trigger 1.0 additional licensed position to provide the extra help ELL students need to learn to standards. This is all in addition to the assumption that districts provide Sheltered English instruction in classrooms that enroll ELL students.

Resource Use Analysis

The 2019 CRERW report does not indicate how districts use ELL funds but does note the ELL population in Wyoming decreased to 2.9 % of student enrollment in SY 2014-15 compared to 3.6% in SY 2006-07. It dropped to 2.7 % in 2018-19 and seems to have stabilized around that level. Since the ADM count has also been essentially flat, that means that the number of ELL students statewide has been about the same for the past few years.

Table 3.30.1 provides a summary of the number of ELL teachers; ELL aides and ELL administrators school districts have employed since SY 2008-09. The number of ELL Teachers rose from a low of 51.8 in 2008-09 to 62.6 in 2018-19; that number is about ten more than the funding model provides. The number of ELL aides, none of whom are provided by either the EB or Legislative models, rose from the low 40s in 2008-09 to 53.7 in 2018-19. The number of ELL administrators has dropped from 5 to just 1.6 in 2018-19.

Table 3.30.1 ELL Related FTEs Employed in Wyoming School Districts, SY 2006-07 to SY 2014-15

School Year	ELL Teachers	ELL Aides	ELL Administrators
2008-09	51.8	43.2	
2009-10	56.1	45.3	
2010-11	54.1	47.1	
2011-12	49.7	60.3	5.0
2012-13	52.3	56.8	4.0
2013-14	54.0	55.6	3.6
2014-15	53.5	56.6	2.5
2015-16	55.8	55.8	3.6
2016-17	64.5	52.2	3.6

School Year	ELL Teachers	ELL Aides	ELL Administrators
2017-18	61.2	50.4	2.6
2018-19	62.6	53.7	1.6
2019-20	66.4	53.6	1.8

Source: Data provided to authors by the Wyoming Department of Education (Vince Meyer e-mail March 26, 2020).

PJ Panel Comments on ELL Students

Overall there are very few ELL students in Wyoming schools. Teton County #1 with 638 of the state's 3,823 ELL students in 2019-20 had the largest number of ELL students in the state, representing 17 percent of the total. For the most part, PJ panelists separated resources generated for ELL students from the resources generated for all at risk students, not fully understanding that each ELL student not only generates the ELL teacher support, but all other resources for at risk students including tutoring, pupil support, extended-day and summer school resources. Moreover, few seemed to recognize that because of the small number of ELL students in Wyoming school districts, the EB model focuses on the Sheltered English approach to meet these student needs.

Other concerns expressed were the need for ELL teachers to work in multiple schools in a district, necessitating a great deal of "windshield" time, reducing their availability to meet with students.

Additionally, some panelists worried about influxes of ELL students over a short period of time and argued that the model does not provide adequate resources to meet their needs, suggesting that newcomer centers might need to be established.

2020 Evidence-Based recommendation

One position for every 100 ELL students. *Note this is in addition to the tutoring, pupil support, extended-day and summer school resources also generated by ELL students.* We would also point out that the Sheltered English approach would mean that districts would not need hire separate ELL teachers as all teachers would be trained in the Sheltered English methodology and thus capable of instructing ELL students.

Concern was expressed by the PJ panels that in some instances, newcomer centers are needed to meet the needs of large influxes of immigrant families with limited English skills. If newcomer centers are needed – and state standards for establishment of such centers were developed – they could be funded as small schools that are currently funded in the EB (and Legislative) Model. This approach allows for establishment of a facility to support large numbers of immigrant families and has been successful in other states and districts (see NCELA, 2020 and Short & Boyson, 2012).

31. Alternative Schools

Alternative schools are secondary schools (usually but always high schools) that provide educational as well as other services for students who have been unable to succeed in regular school programs. They are typically very small schools with no more than approximately 50 students with campuses often located in a corner of a larger school campus. Since 2015 the Wyoming EB model has recommended resourcing these schools exactly the same way as all other schools based on their ADM enrollment, assuming that most would be resourced as a small school with 49 or fewer ADM.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated FTE Staff Difference
No separate formula. Fund as any other school.	Provide funding for all staff at a ratio of 1.0 assistant principal plus 1.0 teacher position for every 7 ADM.	No separate formula. Fund as any other school.	Cost Differences Allocated in Elements Above

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

A small number of students have difficulty learning in the traditional school environment. The alternative learning environment (ALE) students this section addresses are those that also have some combination of significant behavioral, social and emotional issues, often including alcohol or drug abuse. These students often do much better in small ALEs. It is important to note this rationale for an ALE does not consider alternative schools as a placement for students who simply prefer a different approach to learning academics, such as project-based learning, or more applied learning strategies similar to strategies that can be deployed in new CTE programs like computer assisted engineering. The EB Model conceptualizes alternative schools as schools for troubled youth who need counseling and therapy embedded in the school's instructional program. Our understanding is that the state's concept of the purpose of alternative schools aligns with the EB Model.

Alternative school funding approaches can also be used to fund "welcome programs" for students who have recently entered this country, often from an environment of refugee status, refugee camps, and who have had little access to formal schooling. As those programs are small, the current EB and Legislative Model formulas for small schools of 1 assistant principal and 1 teacher position for every 7 students provides the needed resources for such centers.

The Institute for Education Sciences at the United States Department of Education published statistics on alternative schools and programs for SY 2007-08 (Carver & Lewis, 2010). That study identified 558,300 students in 10,300 district-administered alternative education schools and programs across the United States. Although the report did not provide data on the size of these schools or on staffing ratios, the data suggest an average alternative school size of 54 students. Most of the programs served students in grades 9-12. The main reasons students were enrolled in alternative programs – all of which meet our initial definition of severe emotional and/or behavioral problems – included:

- Possession or use of firearms or other weapons
- Possession, distribution, or use of alcohol or drugs
- Arrest or involvement with the criminal justice system
- Physical attacks or fights
- Disruptive verbal behavior
- Chronic truancy
- Continual academic failure
- Pregnancy/teen parenthood, and
- Mental health needs.

One of the major issues states face in creating funding programs for alternative schools is defining them. Our 2010 review of literature and state practice on alternative education provided little guidance for developing a clear definition of alternative education. In 2014, as part of implementing its compulsory attendance laws, Maryland commissioned a study to review state definitions of ALE programs (see Porowski, O'Conner & Luo, 2014). Maryland needed a definition because attendance in an ALE program was an exemption in its compulsory attendance law and the state did not have a clear definition of such programs. The study found great variation across the states in both defining and structuring alternative education programs. Because individual states or school districts defined and determined the features of their alternative education programs, they tended to differ in key characteristics, including target populations, setting, services, and structure.

A formal definition of an ALE program would need to consider the target population (including both grade levels served and types of students), program setting (within a public school or outside such a structure), program offerings (academic, behavioral, counseling, social skills, career counseling, etc.) and structure (how programs are scheduled, staff responsibilities, etc.). The Porowski, O'Conner & Luo (2014) study found wide variation across states (and districts) across all of these elements.

We have concluded the Urban Institute's (Aron, 2006) definition of alternative education closely follows our understanding of alternative programs:

> Alternative education refers to schools or programs that are set up by states, school districts, or other entities to serve young people who are not succeeding in a traditional public-school environment. Alternative education programs offer students who are failing academically or may have learning disabilities, behavioral problems, or poor attendance an opportunity to achieve in a different setting and use different and innovative learning methods. While there are many different kinds of alternative schools and programs, they are often characterized by their flexible schedules, smaller teacher-student ratios, and modified curricula.

In 2010, we also reviewed state standards – where they existed – for alternative schools. Most states used definitions similar to that of the Urban Institute, but we only identified one state, Indiana, that actually established standards for ALE programs. The Indiana Department of Education's (2010) website states:

> While each of Indiana's alternative education programs is unique, they share characteristics identified in the research as common to successful alternative schools.
>
> - Maximum teacher/student ratio of 1:15
> - Small student base
> - Clearly stated mission and discipline code
> - Caring faculty with continual staff development
> - School staff having high expectations for student achievement
> - Learning program specific to the student's expectations and learning style
> - Flexible school schedule with community involvement and support
> - Total commitment to have each student be a success.

We conclude that these characteristics align with the EB Model's view of ALE programs.

From work in other states, we have found that funding formulas for alternative schools differ substantially. In a few states, the typical staffing ratio for an alternative school is one administrative position for the school plus one teacher position for every eight students. Because alternative high schools are generally designed to serve students who are severely at-risk, we recommend the schools remain relatively small. As a result, staff at these schools often must fill multiple roles. Many teachers in alternative schools provide a range of different services for students, including instruction, pupil support, and counseling services. This suggests the staffing structure and organization for instruction in alternative schools is usually different from typical high schools.

Though Wyoming could consider developing a more formal definition of its ALE system, and a set of standards for ALE programs, it does not need to do so for funding purposes. The 2015 and 2020 EB Models do not have a specific alternative school formula for staff resources. Rather, the 2015 and 2020 EB Models resource alternative schools using the small school formula that is part of that regular funding model approach. Specifically, the "regular" EB approach in Wyoming provides one administrative position and one teacher for every seven students in the school up to an enrollment of 49 students. For schools larger than 49 the EB model relies on the EB model elements described above. This funding approach is intended to provide resources for a range of staff – teachers, guidance counselors, secretaries, etc., determined by the school. The school also receives the per pupil allocations (instructional materials, computers and technologies, etc.) in the funding model as well as all at-risk counts triggered resources. The Legislative Model uses the small school of fewer than 49 student model of one assistant principal position plus one teacher position for every seven students for all staff in the building regardless of the size of the alternative school. That funding approach is also intended to provide resources to be spent on a range of staff not only on teachers. An additional caveat about our previous recommendation is it did not envision very large alternative schools, even though the Legislative Model provides the alternative school staffing to larger alternative schools.

In short, the EB model assumes that ALE Schools are small, generally 49 or fewer students, so the "regular" funding formula for such schools of one AP position and one teacher for every seven ADM provides adequate staffing resources (plus all per pupil and all at-risk allocations).

Resource Use Analysis

According to the 2019 CRERW report, in SY 2018-19, there were about 1,115 ADM enrolled in 21 alternative schools in Wyoming.[42] These 21 schools employed more total staff than allocated through the Legislative Model as shown in Table 3.31.1. It is important to note that the variation in teachers is a function of the way resources are generated by the Legislative Model, described above, which provides funding for one assistant principal position for each alternative school plus funding for one teacher position for every seven students in the school. Table 3.31.1 shows that the 21 alternative schools were funded for 161.6 teacher positions, and hired 110.4 teachers, a difference of 51.2 certificated positions. But as the model posits, these schools turned the funding for those 51.2 teaching positions plus the funding for the 8.2 administrative positions not hired into a total of 66.9 positions, which included 7.6 tutors, 16.0 aides, 17.2 pupil support positions, 21.0 clerical positions, 1.4 librarians and 3.7 media technical staff. These variations reflect the intent of the "simple" funding model – provide an adequate level of resources to fund the positions identified as necessary at each individual alternative school.

Table 3.31.1 Legislative Model and District FTE Staffing Comparisons, SY 2018-19

Staff Category	Legislative Model	District Actual	Difference
School Administration	21.0	12.8	(8.2)
Teacher	161.6	110.4	51.2
Tutor		7.6	7.6
Aides		16	16.0
Pupil Support		17.2	17.2
Secretarial/Clerical		21	21.0
Librarians		1.4	1.4
Media Technical Staff		3.7	3.7
Total Staff	**182.58**	**190.1**	**7.5**

Source: WDE. CRERW tables sfp_crerw_appendix_c; tables sfp_crerw_staffing_table_o2; tables sfp_crerw_staffing_table_o3; tables sfp_crerw_staffing_table_o4;

Final Comments

We have not indicated the best way to design and structure alternative education programs. We believe that the resources provided by the EB and Legislative Models are adequate and allow for varying alternative school designs, which the data show have been implemented by the 21 alternative school across the state. Various alternative school program designs and structures can

[42] Source: WDE CRERW tables spf_crerw_adm_table1 and spf_crerw_adm_table9

be found in Flower, McDaniel and Jolivett (2011); Izumi, She and Xia,(2015); Kannam and Anand (2017); and McGee and Lin (2017).

PJ Panel Comments on Alternative Schools

There was very little discussion of alternative schools at the PJ panel sessions. Panelists worked in districts with alternative schools felt the schools were important and provided necessary services to help ensure the students graduate from high school. Although the alternative schools do not always succeed at that goal, panelists felt more students graduated because of alternative school support than otherwise would have graduated. Panelists also felt that the funding levels for alternative schools were adequate and did not suggest additional funding.

2020 Evidence-Based recommendation

No separate formula for alternative schools, fund as any other school. Core staffing for ALE schools with ADM of 49 or less will be one assistant principal position and one teacher position for every 7 ADM, plus all dollar per pupil (Elements 15-19) and at-risk student triggered resources (Elements 26-29); core staffing for ALE schools with ADM greater than 49 will be determined by the model for all other schools in that ADM and grade-level band.

32. Salary Levels

The original MAP study in 1997 and the Picus Odden and Associates recalibration in 2005 used previous year's staff salaries to put a salary "price" on each staff element of the funding model. In addition, those studies conducted an analysis of the cost of an additional year of experience for non-professional staff, and an additional year of experience as well as additional education units for professional staff. The latter allowed the salary used to compute each district's funding allocation to be adjusted by the average education and experience of the staff in that district, reflecting those differences across school districts in the state. Additionally, in the 2005 study, another element for responsibility was added for school and district administrative staff. Between recalibration years, salary levels have been adjusted by an ECA as determined appropriate by the Legislature. In 2015, the salary study conducted by Stoddard (2015) showed that ECA adjusted salaries in the Legislative Model were at market and we recommended that the state continue to use those salaries, with annual ECA adjustments.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated Cost Difference
Accept Legislative Model salaries as cost-based and used in the 2015 EB Model. Additionally, continue the labor market	<u>Superintendent</u>: Base salary $80,155; Bachelor's premium $19,311; Master's premium $25,578; Doctorate's premium $30,791; State	Use average salaries for staff positions, rather than salaries adjusted by education and experience for the following positions:	No FTE changes related to salary level differences, cost differences

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated Cost Difference
monitoring process currently in place.	experience per year premium $215; District per ADM premium $4.29. Assistant Superintendent: 80% of Superintendent. Business Manager: Base salary $44,037; Bachelor's premium $19,311; Master's premium $25,578; Doctorate's premium $30,791; State experience per year premium $215; District per ADM premium $4.29. Principal: Base salary $74,330; Doctorate's premium $8,593; State experience per year premium $645; School per ADM premium $14.68. Assistant Principal: Base salary $60,459; Doctorate's premium $8,593; State experience per year premium $645; School per ADM premium $14.68. Teacher: Base salary $38,404; Master's premium $6,395; Doctorate's premium $13,953; Experience	Superintendent: $130,400 Assistant Superintendent: at 80 percent of superintendent, $104,320 Other Central Office administrators. Directors: average of two times Asst. Sup and business manager: $97,960 Business Manager: $85,240 Principal: $102,000 Assistant Principal: 80 percent or principal: $84,900 Teacher: 75^{th} percentile: $54,500 85^{th} percentile: $61,700 School Computer Technician: $50,500 Supervisory Aide: $22,700 School Secretary: $33,600 School Clerical: $31,900 Central Office Classified: $44,100 Central Office Maintenance: $44,300	reported by category above

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated Cost Difference
	per year premium for 20 years or below $876; Experience per year premium for above 20 years $227. School Computer Technician: Base salary $39,873; Bachelor's or above premium $13,758; State experience per year premium $665. Supervisory Aide: Base salary $17,556; Bachelor's or above premium $2,044; State experience per year premium $282. School Secretary: Base salary $29,770; State experience per year premium $411. School Clerical: Base salary $22,903; State experience per year premium $316. Central Office Classified: Base salary $32,330; State experience per year premium $411. Central Office Maintenance and Operations: Base salary $32,595; State experience per year premium $483.	Custodians and groundskeepers: $30,100	

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated Cost Difference
	Custodian: Base salary $26,462; State experience per year premium $483.		

Analysis and Evidence

Between the 2005 and 2010 recalibrations, salaries in the funding formula drew from the amounts established in 2005, and were increased by ECAs in SY 2007-08, SY 2008-09, and SY 2009-10. During the 2010 recalibration, it was determined the price of salaries in the Legislative Model had allowed salaries paid by school districts to rise above the market, based upon a series of salary benchmarking studies. In response, the Legislature adopted a process to monitor the labor market and continue to use an external cost adjustment to adjust salaries as appropriate. Since the 2010 recalibration, salaries have been adjusted by ECAs for SY 2014-15, SY 2015-16 and SY 2016-17, which were temporary ECAs. Salaries received a permanent ECA for SY 2019-20. For the next two school years, temporary ECAs have been provided by the Legislature.

It is important to note that use of the salary benchmarking studies and adoption of the monitoring process in 2010 moved the state away from basing salaries upon historical salaries paid by school districts and into one in which the "price" of salaries embedded in the Legislative Model is compared to appropriate labor markets. The 2010 recalibration determined the salary levels embedded in the Legislative and EB Models exceeded what the labor market demanded. Further, the 2010 recalibration established a process for the Legislature to annually monitor salaries in years between recalibrations to ensure they continued to meet or exceed the demands of the market while still providing for experience, education and responsibility cost adjustments for each school district.

For the 2015 recalibration, Wyoming retained Dr. Christiana Stoddard to analyze all model salaries with respect to appropriate labor markets. The report (Stoddard, 2015) included an extensive analysis of teacher salaries and a comparison of Legislative Model and actual salaries to a number of different market indicators. The report compared Legislative Model salaries to teacher salaries in other states in the region, to all college graduates, to professional and technical workers, and to workers with similar knowledge, skills and work tasks with the salaries paid to teachers. The results were quite clear – the Legislative Model teacher salaries were generally at or above these market indicators.

These results lead us to conclude that Legislative Model salaries for teachers for SY 2015-16 could be determined to be market based and those teacher salaries could also be used in the 2015 EB Model for the 2015 recalibration effort. We further recommended those salaries be subject to an appropriate, annual ECA as determined by Wyoming's labor market monitoring process.

Stoddard's 2015 report generally concluded that all other Legislative Model salaries were also market based, although it was difficult to find good comparisons for some educational jobs such as superintendents. Stoddard found that nearly all non-teacher salaries were at or above similar government jobs.

Those results led us to conclude that Legislative Model salaries for all non-teacher positions were at or above market and could be also be used in the 2015 EB Model for the 2015 recalibration effort. As with teachers, we further recommended those salaries be subject to an appropriate ECA as determined by Wyoming's labor market monitoring process on an annual basis.

We also recommended continuing the labor market monitoring process to make sure broader economic conditions do not push salary levels off their market-based position and create salary distortions before the next recalibration effort.

Stoddard (2020) continued the monitoring analyses for the 2020 recalibration. With the inconsistent ECAs given in the previous five years, Stoddard found that both actual and model salaries have lost their substantial market advantages over surrounding states and are more closely aligned to the average of the U.S. and adjacent states as a percentage of comparable jobs.

Stoddard used average salaries in her analysis. We have concluded that the salary adjustments in the Wyoming Funding Model for education, experience and responsibility should be reconsidered. These adjustments are not strongly related to student performance and add unnecessary complexity to the funding model. Rather than continue adjusting for education, experience and responsibility, we propose the state shift to an average salary for each position, subject to an annual ECA.

The question, then, is what average salary? What is needed is a study of recruitment, selection and retention of effective education staff in multiple districts, as well as a study of measures of teacher effectiveness. The latter study is unfortunately not available for this recalibration, and even if it was would likely come up short in identifying the salary level is needed to recruit and retain high quality teachers and other education staff because the state lacks measures of teacher effectiveness. However, we recommend such a study be conducted in the future.

As a fallback, the state should adopt a salary benchmark for teacher salaries linked to comparable salaries. The 2020 Stoddard report shows that *model* teacher salaries are at about 75 percent of professional technical workers, and at the mid-point of teacher salaries of neighboring states. The same report shows that *actual* salaries are closer to 85 percent of professional technical workers, where it was several years ago, and near the top of comparable teacher salaries in neighboring states.

Increasing model salaries to actual salaries would entail approximately a 10 percent salary increase. Unfortunately, without a change in way teacher compensation is structured, moving to actual salaries would give Wyoming the same education system it has today but at a higher cost.

That leaves the question of what could be used to guide the Legislature in making a decision on whether to use the teacher salary at the 75th percentile or the 85th percentile?

We have argued throughout this report that Wyoming should be getting more student performance from the adequate funding it provides school districts. For that to happen, changes in practice need to occur. This report has suggested that: 1) a science-based reading program needs to be taught in all districts, 2) all schools should create Professional Learning Communities (PLCs) in which teachers improve instructional practice, 3) instructional facilitators need to be increased to full EB model recommended funding that will provide teachers the coaching they need to effectively deploy the new kinds of pedagogical practices required to deliver a curriculum program linked to state standards, and 4) a more robust Multi-Tiered System of Supports in all schools. The Special Education Report calls for a similar system of practice changes. Thus, it would seem reasonable to argue that a salary increase, i.e., adopting the average teacher salary at 85 percent of professional/technical worker wages, should be linked to incentives designed to improve the performance of the Wyoming education system.

We recommend that model salaries be set at 75 percent of professional technical workers, where it is today, if the legislature does not enact some type of performance enhancement system. But we recommend that model salaries be increased to 85 percent of professional technical workers, about the level of actual salaries today, if the state creates some type of performance enhancement program to help ensure that the costs of higher salaries lead to higher levels of student performance.

For the non-teaching positions, we recommend the salary levels found in the Stoddard (2020b) report. For clarification, we note that since 2005, the salary for central office staff other than the superintendent, assistant superintendent and business manager, has been set as the average of two times the salary of the assistant superintendent and that of the business manager. Further, we note that custodians and groundskeepers receive the same salary and that only maintenance workers – plumbers, electrician, carpenters, HVAC experts, etc. – be given the salary of maintenance workers.

Finally, we strongly recommend the state adopt the EB Model's core class size recommendations in place of the Legislative Model's class sizes. This would provide resources adequate to finance current actual class size practice, by eliminating the Legislative Model's resources for lower class sizes, resources districts have used for fifteen years to raise salaries above that of the funding model. It would also free up resources to help finance a salary increase and full funding of the other elements of the EB Model.

2020 Evidence-Based recommendation

Continue the labor market monitoring process currently in place and launch a more detailed study of the linkage between salaries and districts' ability to recruit, select, and retain high quality teachers. Set model salaries at 75 percent of professional technical workers – where it is today – if no performance enhancing programs are enacted. Set model salaries at 85 percent of professional technical workers, about the level of actual salaries today, if the state adopts some type of performance enhancement program.

33. Regional Cost Adjustment (RCA) and External Cost Adjustment (ECA)

RCA

Putting the correct price on each element in the funding model ensures that the dollars produced by the formulas are adequate for each district and school to purchase all elements in the model. However, as Wyoming has recognized for years, the purchasing power of the education dollar varies across geographic regions of the state. To understand how this impacts the distribution of adequate funds to all school districts, Dr. Lori Taylor has been asked for over a decade to develop an index that quantifies these price variations and has again produced a report for the 2020 recalibration that includes a recommendation for the Regional Cost Adjustment (RCA) (Taylor, 2020a).

We refer readers to that report in which Taylor identifies and discusses the advantages and disadvantages of three approaches to addressing regional cost variations: The Hedonic Wage Index (HWI), the Comparable Wage Index (CWI), and the Wyoming Cost of Living Index (WCLI). All are normed to the state average and produce an index value for each district that varies above and below the index average (typically defined as 1.0 or an index value of 100). The RCA currently used to distribute revenue to Wyoming school districts uses two of these indices, the WCLI and the HWI that was developed for the 2005 recalibration, with one addition. As a result, the RCA used in the Legislative Model for each district is the greater of the WCLI, the 2005 HWI or a value of 1.0. As Taylor points out in her study, the use of a minimum adjustment of 1.0 artificially increases the RCA for a large percentage of districts across the state.

In past years, Taylor had recommended using a CWI, with values ranging above and below the index average of 1.0. Because the data for calculating that index are not currently being updated on an annual basis by the federal government, Taylor's 2020 recommendation is that the state use a new HWI that she computed. She recommends using this HWI as the only index for computing the RCA and that the HWI values be allowed to range above and below the state-wide average. In calculating the 2020 HWI, Taylor modified the statistical model to represent current advances in economics that lead to more representative and accurate hedonic wage indexes. In addition to an enhanced and more accurate set of variables, in the cases where variables used in 2005 remained in the 2020 HWI, Taylor updated their values to the most recent data available.

We concur with Taylor and recommend that the state use her 2020 Hedonic Wage index as the RCA.

ECA

In addition to making adjustments for regional variations in costs, the price of all the educational elements in the EB are likely to change over time. Wyoming has recognized this by including an External Cost Adjustment (ECA) in the funding model. In theory an ECA should be computed and applied on an annual basis to ensure that the model accurately captures the costs of each element in the basket of educational goods and services, and to ensure that model funding remains adequate.

Dr. Lori Taylor developed an updated ECA for the 2020 recalibration. Using the model, she created for a previous recalibration, Dr. Taylor's report includes updated ECAs for four categories of resources allocated to school districts through the model: professional staff resources, non-professional staff resources, utilities, and educational materials. Table 3.33.1 shows how these indices have varied over time, and what the appropriate indices would be for 2019-20.

Table 3.33.1: The Recommended Cost Indices for Funding Model Components

Year	Professional Staff Cost Index	Nonprofessional Staff Cost Index	Composite Energy Cost Index	Educational Materials Cost Index
2009-10	100	100	100	100
2010-11	104	103	104	101
2011-12	107	106	109	104
2012-13	109	108	105	106
2013-14	111	110	108	108
2014-15	113	112	112	110
2015-16	116	115	101	110
2016-17	119	119	97	111
2017-18	121	120	105	112
2018-19	123	123	110	117
2019-20	125	126	108	122

Source: Taylor (2020b).

We recommend that the ECA for each of the four general components be applied to the funding model each year.

34. Health Insurance

Wyoming has taken a clear and substantive approach to addressing the costs of health insurance in education staff compensation. Specifically, the Legislative Model funding includes a dollar amount for health insurance benefits for each eligible employee. That dollar amount equals the average amount Wyoming provides for its State employees. The implicit signal is the State encourages school districts to provide health insurance support for every employee, just as the State does for its employees. This dollar amount is provided for every staff position in the EB Model except positions for summer school and extended day, which is a change from past recommendations. The assumption is that staff providing summer school and extended day services are staff members working during the year and already have health insurance.

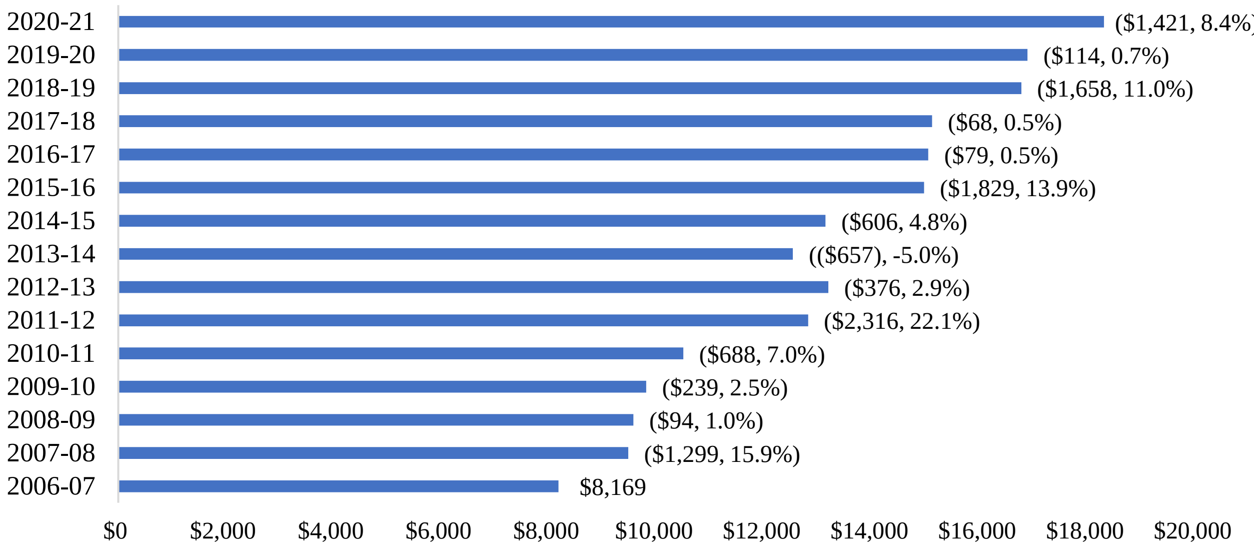
2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated Cost Difference
Compute a health insurance composite amount for each	Compute a health insurance composite amount for each	Compute a health insurance composite amount for each	*Note: there is a difference of -$11.0 million*

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	Estimated Cost Difference
generated FTE based upon 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. For SY 2020-21 the per FTE amount is $18,298.00. *Amount in this column has been inflated to levels in the Legislative Model and 2020 EB Recommendation columns.*	generated FTE based upon school year 2019-20 levels, $16,876.60. Limit additional increases for the FY 2020-2021 biennium to funding model positions that participate in school district health insurance plans and 50% of the increase to funding model positions that do not participate in school district health insurance plans. Health insurance calculations are based upon 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. For SY 2020-21 the per FTE amount is $18,298.00.	generated FTE based upon 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. For SY 2020-211 the per FTE amount is $18,298.00. No health insurance for summer school or extended day positions.	*in the EB cost estimate because the EB model assumes Summer School and Extended Day teachers are the teachers currently employed by the district and thus already receiving health insurance. The Legislative model funds health insurance for these two programs, but it is not included in the Summer School and Extended Day elements of the EB model.*

Analysis and Evidence for the 2020 Recalibration

The EB and Legislative Models generally are in agreement on the approach to supporting health insurance outlined above. The agreement is that the state will support health insurance benefits for educators at the same level as for state employees. The historical health insurance resources included in the funding formula are displayed in Figure 3.34.1.

Figure 3.34.1. Historical Funding Model Amount for Health Insurance per FTE ($ change, % change).



Source: LSO analysis of historical funding models.

The health insurance amount for each FTE in the funding model was $8,169 in SY 2006-07, the first-year implementation of the 2005 recalibration. Figure 3.34.1 shows that this amount increased every year; for SY 2020-21 the per FTE amount is $18,298.00. The dollar amount in the funding model is provided for each staff position generated, with the exception of SY 2020-21 and SY 2021-22. During the 2020 Budget Session, the Legislature provided the full increase in health insurance funding for the FY 2021-2022 biennium only to those school district employees funded by the funding model and participating in the school district's health insurance plan; funding model employees not participating in a district's health insurance plan only receive 50 percent of the increase.[43] Health insurance expenditures for special education and transportation staff are reimbursed 100 percent of allowable expenditures for those staff members actually participating in a school district's health insurance plan.

Wyoming is unique among the states in that it has an explicit policy for including health care insurance support in the school funding formula; specifically, the state provides funding equal to the amount provided for health insurance support for State employees, and on this both the Legislative and EB Models agree. The amount for health insurance for each FTE in the funding model represents approximately 82 percent of health insurance costs and assumes employees – both State and local school district employees –pay the remaining 18 percent. Wyoming's policy on health insurance also includes a provision allowing any school district to opt into the State health insurance plan, the costs of which would be covered by the Legislative Model funding formula amount. The only additional stipulation is if a district opts into the State plan, then eligibility requirements to participate in the health insurance plan are no longer controlled by the

[43] See 2020 Wyoming Session Laws, Chapter 80, Section 334.

school district, but by the State's plan and the school districts must adhere to the State's insurance requirements for participation. Generally, this makes more employees eligible for health care insurance.

School District Employee Health Insurance Participation[44]

Table 3.34.1 summarizes the total funding model staff FTEs and actual staff FTEs enrolled in school district health insurance plans. These data exclude special education and transportation staff and only include state funded positions to make a comparison to the funding model staff resourced to school districts. Prior to SY 2011-12, the Wyoming Department of Education (WDE) could not identify federally funded or other funded positions, thus the analysis only includes the school years beginning with 2011-12. That data show that the funding model provided significantly more staff FTE than districts actually hired. And health insurance has been provided for every FTE in the model, not just for every FTE hired.

Table 3.34.1. School District Employee Participation in District Health Insurance Plans.

School Year	Funding Model Staff FTEs	Enrolled Staff FTE in District Health Insurance Plans	District Staff FTE Difference from Funding Model	District Staff FTEs as Percent of Funding Model FTEs
2011-12	11,994	9,470	(2,524)	79.0%
2012-13	12,127	9,419	(2,708)	77.7%
2013-14	12,268	9,459	(2,809)	77.1%
2014-15	12,409	9,489	(2,921)	76.5%
2015-16	12,485	9,491	(2,994)	76.0%
2016-17	12,622	9,311	(3,311)	73.8%
2017-18	12,832	8,967	(3,865)	69.9%
2018-19	12,511	8,899	(3,612)	71.1%

Source: LSO analysis of WDE data.

The funding model staff FTEs include:

- Staff positions generated within the "block grant"
- Instructional facilitator positions generated within the categorical grants for SY 2011-12 through SY 2016-17 (moved to block grant in SY 2017-18), and
- Summer school and extended day positions generated within the block grant beginning SY 2017-18.

School district participation, defined as the proportion of district staff FTE to the funding model FTEs, has decreased every year since SY 2011-12, except SY 2018-19.

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[44] The following is largely taken from the Memo the LSO prepared for the Recalibration Committee in August 2020 in response to questions asked about health insurance expenditures and participation.

School District Health Insurance Expenditures

Analysis of Wyoming school district expenditures show school districts spend less on health insurance than they receive from the funding model (including the instructional facilitator categorical grant), as shown in Table 3.34.2. The table provides a statewide summary of health insurance resources provided by the funding model and school district expenditures.

Table 3.34.2. Funding Model Health Insurance Actual Expenditure Analysis.

School Year	Funding Model Health Insurance Funding	District Health Insurance Expenditures Less Special Education and Trans-portation[45]	Difference between Funding Model and Actual Expenditures	Special Education and Trans-portation Expenditures for Health Insurance	Total Funding Model Health Insurance Funding
2006-07	$94,110,860	$89,801,434	($4,309,426)	$19,397,360	$113,508,220
2007-08	$109,108,689	$90,677,675	($18,431,014)	$21,248,032	$130,356,721
2008-09	$111,585,016	$98,287,511	($13,297,506)	$22,632,344	$134,217,360
2009-10	$115,168,465	$110,214,217	($4,954,247)	$27,083,951	$142,252,415
2010-11	$124,465,356	$112,522,119	($11,943,236)	$28,200,612	$152,665,968
2011-12	$153,582,150	$124,783,140	($28,799,010)	$31,107,345	$184,689,494
2012-13	$159,835,902	$129,807,295	($30,028,607)	$32,507,456	$192,343,357
2013-14	$153,627,002	$128,523,032	($25,103,969)	$33,488,194	$187,115,195
2014-15	$162,921,989	$132,958,346	($29,963,642)	$35,639,306	$198,561,294
2015-16	$186,758,515	$143,552,441	($43,206,074)	$39,601,436	$226,359,951
2016-17	$189,797,672	$145,942,420	($43,855,252)	$41,759,303	$231,556,975
2017-18	$193,832,808	$143,328,891	($50,503,917)	$42,051,707	$235,884,515
2018-19	$209,720,076	$142,547,110	($67,172,966)	$42,031,618	$251,751,694

Source: LSO analysis of WDE data from the WDE601 Annual District Report, General Fund, Objects 23x and 27x excluding Functions 1200, 1210, 1211,1250, 2230, 3510, and 3520; Special Revenue Fund, Objects 23x and 27x, Fund Code INST FACIL.

The difference in funding model health insurance allocations to district and actual expenditures has increased from a low of $4.3 million in SY 2006-07, to a high of $67.2 million in SY 2018-19. Part of the reason for the increase is that summer school and extended day funding was embedded into the block grant in SY 2017-18. Prior to that school year, the funding was not included in the funding model's health insurance funding amount displayed in Table 3.34.2. It should be noted, school districts have reported modest health insurance expenditures related to summer school when the funding was resourced as a categorial grant – between $65,000 and $100,00 per year – even though health insurance funding was part of the funding formula. Specific school district expenditure differences for SY 2018-19 can be found in Table 3.34.3.

[45] Sublette #9 funded $7,905,000 and $1,822,685 in 2006-2007 and 2007-2008 respectively in prepaid health reimbursement arrangement with rebated recapture funds.

Table 3.34.3. School Year 2018-19 Funding Model Health Insurance Funding and Actual Expenditures.

District	Model Funding	District Expenditures	Difference	District Percent of Statewide Total Difference
Albany #1	$8,587,866	$5,240,824	($3,347,042)	5.0%
Big Horn #1	$2,629,805	$1,256,495	($1,373,310)	2.0%
Big Horn #2	$1,696,015	$930,344	($765,671)	1.1%
Big Horn #3	$1,266,228	$602,044	($664,185)	1.0%
Big Horn #4	$916,938	$514,793	($402,145)	0.6%
Campbell #1	$18,663,534	$12,783,489	($5,880,046)	8.8%
Carbon #1	$4,086,346	$1,593,961	($2,492,385)	3.7%
Carbon #2	$2,255,701	$1,848,263	($407,438)	0.6%
Converse #1	$3,874,531	$2,477,418	($1,397,113)	2.1%
Converse #2	$1,550,668	$1,179,851	($370,817)	0.6%
Crook #1	$3,069,691	$2,123,166	($946,524)	1.4%
Fremont #1	$3,950,160	$1,965,983	($1,984,178)	3.0%
Fremont #2	$693,788	$436,072	($257,716)	0.4%
Fremont #6	$1,238,293	$861,982	($376,310)	0.6%
Fremont #14	$1,734,634	$2,055,907	$321,273	-0.5%
Fremont #21	$1,500,617	$1,644,260	$143,643	-0.2%
Fremont #24	$1,144,636	$671,593	($473,043)	0.7%
Fremont #25	$5,410,930	$4,434,042	($976,888)	1.5%
Fremont #38	$1,184,312	$1,114,523	($69,789)	0.1%
Goshen #1	$4,271,868	$3,381,631	($890,237)	1.3%
Hot Springs #1	$1,582,285	$646,793	($935,492)	1.4%
Johnson #1	$3,348,425	$1,599,382	($1,749,043)	2.6%
Laramie #1	$29,632,922	$21,316,647	($8,316,275)	12.4%
Laramie #2	$2,617,242	$1,867,928	($749,314)	1.1%
Lincoln #1	$1,555,793	$754,996	($800,798)	1.2%
Lincoln #2	$6,278,195	$3,567,705	($2,710,490)	4.0%
Natrona #1	$27,040,439	$22,568,587	($4,471,852)	6.7%
Niobrara #1	$1,857,986	$969,504	($888,482)	1.3%
Park #1	$3,913,968	$2,292,320	($1,621,648)	2.4%
Park #6	$4,320,416	$2,446,812	($1,873,604)	2.8%
Park #16	$582,842	$325,313	($257,529)	0.4%
Platte #1	$2,522,269	$2,313,360	($208,910)	0.3%
Platte #2	$841,916	$714,046	($127,870)	0.2%
Sheridan #1	$2,480,535	$1,188,169	($1,292,366)	1.9%
Sheridan #2	$7,316,751	$4,412,447	($2,904,304)	4.3%
Sheridan #3	$638,769	$459,671	($179,098)	0.3%

District	Model Funding	District Expenditures	Difference	District Percent of Statewide Total Difference
Sublette #1	$2,382,205	$1,931,771	($450,433)	0.7%
Sublette #9	$1,477,846	$611,255	($866,591)	1.3%
Sweetwater #1	$12,059,375	$6,172,115	($5,887,259)	8.8%
Sweetwater #2	$5,712,993	$3,262,517	($2,450,476)	3.6%
Teton #1	$6,114,616	$5,355,493	($759,123)	1.1%
Uinta #1	$5,939,687	$4,352,212	($1,587,475)	2.4%
Uinta #4	$1,852,677	$860,414	($992,263)	1.5%
Uinta #6	$1,716,317	$1,318,532	($397,786)	0.6%
Washakie #1	$2,919,586	$2,265,436	($654,150)	1.0%
Washakie #2	$562,983	$407,139	($155,845)	0.2%
Weston #1	$1,792,322	$887,017	($905,305)	1.3%
Weston #7	$932,155	$562,887	($369,268)	0.5%
Total	**$209,720,076**	**$142,547,110**	**($67,172,966)**	**100.0%**

Source: LSO analysis of WDE data from the WDE601 Annual District Report, General Fund, Objects 23x and 27x excluding Functions 1200, 1210, 1211,1250, 2230, 3510, and 3520.

Although there is a large difference between number of staff allocated in the model and the number of staff actually hired, leading to actual health insurance expenditures being less than allocated insurance funds, districts should hire the number of staff allocated by the EB model if significant improvement in student learning is to occur. We recommend that the legislature take actions to ensure that districts deploy educational strategies more in line with the staffing provided by the EB Model. This would not only lead to improvements in student achievement but also would bring health insurance expenditures more in line with the amount allocated.

2020 Evidence-Based recommendation:

Include a fixed amount for health care insurance as a benefit in compensation for all staff in the EB Model, except for summer school and extended day. The amount should be the average that the State pays for State employees weighted based upon school district employee participation in their own plans. For SY 2020-21 the per FTE amount is $18,298.

35. Benefits

In determining staff costs, the Legislative Model generates a specific salary for various positions for each school district and adds to that figure the costs of employee benefits beyond health insurance (Element 34). These benefits include worker’s compensation, unemployment insurance, State retirement, Social Security and Medicare.

Wyoming takes a cost-based approach to all of these benefit costs and we recommend the State continue this approach.

2015 Evidence-Based Recommendation	Legislative Model (Current Law)	2020 Evidence-Based Recommendation	*Estimated Cost Difference
Worker's Compensation: 0.70% of salary. Unemployment Insurance: 0.09% of salary. Retirement: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and State decide on reimbursement of additional retirement costs currently reimbursed (1.25% employer share and 0.375% employee share – FY 2016-17 only). Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	Worker's Compensation: 0.70% of salary. Unemployment Insurance: 0.06% of salary. Retirement: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and reimburse actual expenditures as required by current law (FY 2020 1.75 percent; FY 2021, 2.00 percent, FY 2022 and beyond 2.25 percent). Employee share not paid by State: FY 2020 3.18 percent, FY 2021 3.43 percent, and FY 2022 and beyond 3.68 percent. Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	Workers' Compensation: 0.70% of salary. Unemployment Insurance: 0.09% of salary. Retirement: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and reimburse actual expenditures as required by current law. Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare). Social Security limited to federal amount, currently $137,700.	$0 *Note: estimate is variable to salary and FTEs* $0 $0

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2020 recalibration process.

Analysis and Evidence

Four elements are discussed below: worker's compensation, unemployment insurance, state retirement and Social Security and Medicare.

Worker's Compensation

Worker's Compensation is currently 0.70% of salaries.

School district actual expenditures on worker's compensation (less reimbursable costs for special education and transportation) as a percentage of total salaries have fluctuated from 0.45 percent in SY 2009-10 to 1.01 percent in SY 2015-16, as Table 3.35.1 shows. Until the high point in SY 2015-16, the percentage was at or below the 0.70 percent in the formula every year from 2008-09 to 2012-13. It then crept up to 1.01 percent by SY 2015-16, and then dropped to 0.89 percent the next year, followed by 0.71 percent and finally 0.61 percent in 2018-19. These changes above and below the current formula number of 0.70 percent suggest that 0.70 percent figure is a good approximation of the cost of worker's compensation as a percent of salaries. Although this figure can be recalculated every year and put into the funding formula for each succeeding year, the amount is so small that this fine-tuning is not warranted. We recommend leaving worker's compensation rate at 0.70 percent of salaries and monitoring the figure for possible large changes in the future.

Table 3.35.1 Worker's Compensation and Unemployment Insurance Expenditures as a Percent of Salaries (Excluding Special Education and Transportation), SY 2008-09 to SY 2018-19

School Year	1xx - Personal Services- Salaries	24x –Worker's Compensation	Worker's Compensation % of Salaries	25x - Unemployment Insurance	Unemployment Insurance % of Salaries
2008-09	$583,719,682	$3,131,616	0.54%	$413,554	0.07%
2009-10	$608,638,827	$2,726,083	0.45%	$743,264	0.12%
2010-11	$615,455,747	$2,892,718	0.47%	$842,903	0.14%
2011-12	$631,176,740	$3,510,832	0.56%	$683,980	0.11%
2012-13	$640,338,442	$4,287,538	0.67%	$924,930	0.14%
2013-14	$650,377,810	$5,139,535	0.79%	$642,598	0.10%
2014-15	$663,912,001	$5,586,178	0.84%	$396,930	0.06%
2015-16	$675,010,005	$6,801,871	1.01%	$510,056	0.08%
2016-17	$671,357,440	$5,948,793	0.89%	$662,394	0.10%
2017-18	$671,363,128	$4,770,917	0.71%	$529,027	0.08%
2018-19	$670,337,097	$4,077,174	0.61%	$478,402	0.07%

Source: WDE WDE601 Annual Report. General Fund Salaries and Worker's Compensation Benefits and Unemployment Benefits Excluding Special Education and Transportation Reimbursements (Functions: 1200, 1210, 1211, 1250, 2230, 3510 and 3520)

Unemployment Insurance

Unemployment Insurance is currently 0.06% of salaries.

School district expenditures on unemployment compensation (less reimbursable costs for special education and transportation) as a percentage of total salaries have fluctuated in recent years but have consistently exceeded the 0.06 percent in the funding formula. Recognizing the rising costs of unemployment insurance in 2015, the EB Model recommended the figure be increased to 0.09 percent, but the Legislative Model retained the figure at the 0.06 percent level. The data in Table 3.35.1 show that over the past eleven years, unemployment compensation expenditures have exceeded 0.06 percent in every year except one, although the figure has declined modestly in each of the past three years. Nevertheless, even given these fluctuations, it seems the costs of unemployment compensation are higher than the number in the funding formula. Indeed, the average for the past ten years has been 0.10 percent. Thus, the WASBO recommendation of 0.09 percent in 2015, with which we concurred, seems a reasonable figure even today. Although the data exist to update this percentage every year, we believe the effort is not warranted. We recommend increasing the benefit percentage for unemployment insurance to 0.09 percent and leaving it constant until the next recalibration. This would increase the EB Model by an estimated $196,000 for SY 2020-21.

Retirement

Wyoming has enacted some short-term changes in the State retirement program. At present, the 12.69 percent of salary for retirement benefits is funded inside the Legislative Model. However, the State currently funds short-term changes in these percentages outside the Legislative Model. In particular, for FY 2020 the state funded 1.75 percentage points of employer contributions, 2.00 percentage points will be funded for FY 2021, and 2.25 percentage points will be funded for FY 2022 and beyond. The employee share not paid by State was 3.18 percentage points in FY 2020, 3.43 percentage points in FY 2021, and 3.68 percentage points in FY 2022 and beyond.

The issue is whether to fund changes in retirement contributions “inside” or “outside” the block grant. As noted above, during the past few years, temporary increases in the employer portion of retirement benefits have been funded outside the block grant because it requires less State money. The lower cost is largely because districts hire fewer staff than resourced. On the other hand, districts generally pay staff more than the Legislative Model provides, so while incremental retirement costs today are less if funded outside the Legislative Model, that fact could change in the future. This would not be an issue if districts hired and paid staff more in line with what the Legislative (or EB) Model provides, but until that time, we see no problem with the Legislature funding incremental retirement costs outside the block grant. Funding this outside of the block grant ensures that what the Legislature spends appropriately reimburses districts for required increased costs. We recommend the current 12.69% of salaries for employer retirement costs be funded inside the block grant and that the State decide on whether to fund incremental costs above that figure outside the block grant.

Social Security and Medicare

The rates for Social Security (6.2% of salary) and Medicare (1.45% of salary) have not changed and should be retained at those percentages in the Legislative Model. Any changes in Social Security, including the maximum salary, and Medicare should immediately be included in the Legislative Model. It should be noted that Social Security applies to salaries only up to $137,700.

2020 Evidence-Based recommendation:

For employee benefits, other than health insurance provide:

- Worker's Compensation: 0.70% of salary;
- Unemployment Insurance: 0.09% of salary;
- State Retirement: 12.69% (7.12% employer and 5.57% employee) inside the block grant and continued reimbursement of incremental changes outside the block grant; and
- Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare) and Social Security limited to salaries up to federal amount, currently $137,700.

38. School District School Finance Audit Process

The operation of the Wyoming Funding Model requires the use of data at both school and district levels. In addition, the WDE collects data from school districts, promulgates rules and regulations on various model elements, and administers the statewide payment model to ensure accurate funding to school districts. In order for the formulas to work as legislatively intended, every data element in the formula must be accurate. To ensure this is the case, each year the Wyoming Department of Audit conducts audits in a sample of school districts to ensure the data reported to the WDE are accurate, school districts are following the law, and the WDE inputs the data into the statewide payment model accurately. Several data points are audited, including, for example, the following:

- Number of students (ADM)
- Number of CTE students, and number of CTE teachers
- Average teacher experience and education units
- School facilities data from the SFD, and
- Reimbursable special education and transportation expenditures.

The audit findings are then sent to the WDE. When the audit identifies inaccuracies, it is the WDE's responsibility to determine if changes in state aid allocations are warranted – to either increase or decrease district funding depending on the finding. This is clearly an essential process and should continue. No funding formula can work as intended unless the data it uses are accurate.

We strongly recommend that the school district school finance audit process be continued. We further recommend that the WDE periodically review the rules and regulations for the Wyoming Funding Model and guidance concerning data needs from each district to operate the statewide payment model, especially after a recalibration.

2020 Evidence-Based recommendation:

Continue with the school finance audit process.

Chapter 4
Additional Issues for the 2020 Recalibration

INTRODUCTION

In addition to recalibrating the elements of the Evidence-Based (EB) model, we were asked to review five additional issues: Preschool, School Safety, Transportation, Food Services, and Special Education. Preschool and School Safety are included here. Transportation and Food Services are included in Chapter 3 as elements 24 and 25 respectively. Special Education is discussed in a separate report prepared by the District Management Group (2020) and submitted to the select committee under separate cover.

NEW ISSUES

Preschool

Preschool education has received considerable attention in recent years, including a major push to expand preschool education by both states and the Federal government. As of May 2020, 44 states plus Washington, D.C. offered stated-funded preschool programs. According to the National Institute for Early Education Research, states enrolled 1.58 million children in public pre-school programs in 2018 (Friedman-Krass et al., 2019). Wyoming is one of six states without a state funded preschool program, and to date the State Supreme Court has not required preschool programs as part of the educational goods and services that schools must provide.

Underpinning the national movement to expand preschool programming is growing evidence that high-quality, and only high-quality, preschool programs are an effective way to help all children succeed in school (Camilli, et al., 2010; Friedman-Krass, et al., 2019; Kauerz, 2006). Research shows that preschool programs are most effective for at-risk children who are not likely to come to kindergarten fully prepared (McCoy, et al., 2017). When paired with well-resourced elementary schools, preschool programs can help at-risk children catch-up with their better-prepared schoolmates (Takanishi, 2016; Takanishi & Kauerz, 2008). In other words, there also is growing recognition that integrating preschool programs with the traditional public-school system, particularly grades K-3, could strengthen the effect of both preschool programs and programs in grades K-3. In this sense, Wyoming is particularly well positioned to launch an effective preschool program because its elementary schools are well-resourced through the state's funding model. This suggests a Wyoming investment in preschool programs could result in a high return in terms of improved future student performance.

Evidence and Analysis

High quality preschool positively impacts student performance. Research shows that high-quality preschool, particularly for students from lower income backgrounds, significantly affects future student academic achievement as well as other desired social, economic and community outcomes. Longitudinal studies show that students from lower-income backgrounds who experience a high-quality, full-day preschool program perform better in learning basic skills in elementary school, score higher on academic goals in middle and high school, attend college at a greater rate and, as adults, earn higher incomes and engage in less socially undesirable behavior. (Barnett, 1995, 1998, 2010, 2011; Camilli et al., 2010; Lynch, 2007; McCoy, et al., 2017; Pianta, et al., 2012; Reynolds et al., 2001, 2011; Schweinhart et al., 2005; Slavin, Karweit, & Wasik, 1994). In 2005, a long-term study of the High/Scope Perry Preschool Program found that adults at age 40 who were enrolled in the program had higher earnings, were more likely to hold a job, had committed fewer crimes, and were more likely to have graduated from high school than adults who did not have preschool (Schweinhart et al., 2005).

In summarizing the positive impacts from numerous studies, Lynch (2007) and a 2014 Education Commission of the States report (Workman, Griffith & Atchison, 2014) identify the multiple benefits of preschool programs for children who participate in high-quality preschool programs:

- Enroll in K-12 education better prepared resulting in lower spending on extra help services
- Require less special education
- Are less likely to repeat a grade
- Are less likely to need child welfare services
- Are less likely to engage in criminal activity as juveniles and adults
- Are less likely to need social welfare support services as adults
- Generally, have higher incomes when they enter the labor force
- Pay higher taxes as a result of their higher incomes, and
- Are likely to have employer-provided health insurance.

The consistent and recurring theme in the analyses is the multiple benefits and long-term savings that accrue to *high-quality* preschool programs.

High-quality programs depend on the quality of the individuals employed to run the program and their commitment to their job – teachers with a BA degree and paid at the same salary as other teachers in a district – as well as a comprehensive array of services beyond the schooling part of the program. (Camilli et al., 2010; Manning et al., 2019; Whitebrook, 2004), Moreover, it is possible to identify the additional components needed to support high-quality programs. In 2010 the National Institute for Early Education Research (NIEER) established 10 quality benchmarks to identify program quality, and modified them in 2017 to make them consistent with more recent research (Institute of Medicine and National Research Council, 2015; Pianta, et al., 2009; Weiland, 2016).[46] The slightly revised and enhanced standards listed below are similar to the previous standards and track closely to the elements of the EB model.[47] The new standards include:

1. Comprehensive early learning development standards that are horizontally and vertically aligned with K-3 curriculum standards and programs
2. Support for curriculum implementation
3. Teachers with a bachelor's degree (Falenchuck, et al., 2017; Manning et al., 2017)

[46] See http://nieer.org/wp-content/uploads/2017/05/YB2016_StateofPreschool2.pdf .pp 14-17 for a detailed description of the NIEER quality standards.
[47] Confirmed by conversations between the authors and Steven Barnett, the director of NIIER

4. Teachers with specialized training in early childhood (Institute of Medicine and National Research Council, 2015)
5. Assistant teachers with a Child Development Associate credential or the equivalent (Heisner & Lederberg, 2011).
6. Teacher in-service training of at least 15 hours per year, with coaching for both teachers and assistant teachers (Egbert et al., 2018; Pianta, Downer, & Hamre, 2016)
7. Class sizes of 20 or fewer students
8. Staff to child ratios of 1 to 10 or better
9. Vision, hearing and health screening and referral and support services, and
10. Continuous quality improvement systems.

For many years, nearly all of the longitudinal, randomized controlled studies of preschool programs relied on data from three preschool programs that met the above standards: High-Scope Perry Preschool Program, North Carolina Abecedarian Project, and the Chicago Child-Parent Center Program. These results reinforced the finding that the most robust impacts of preschool programs are those that emerged from studies of the *effect of high-quality programs*. In an important addition to this broad conclusion, Garcia, Heckman, Leaf & Prados (2016) concluded that males placed in relatively low-quality programs experience far more negative consequences than females, which suggests that high program quality is necessary to generate quality outcomes for both male and female children.

The Case for Integrated PreK-3 Programs

The research cited above largely addressed preschool as separate programs. While there is growing evidence that integrating preschool programs with primary grades can lead to increased educational benefits, this field has not been explored as extensively. Takinishi (2016) is an exception, and as noted above, the NIEER now includes integration of preschool with the K-3 program as a core program quality standard.

Takanishi and Kauerz (2008) and more recently Takanishi (2016) argue that the PreK-3 years are the cornerstone of any educational system and point out the importance of quality integrated PreK-3 programs in providing strong foundations for lifelong learning, educational excellence, and competitiveness in the marketplace. Bogard (2003) suggests that variability in preschool experiences is a strong predictor of children performance, and the link is even stronger for low-income children. She suggests that a PreK-3 approach to early childhood education will help to level the playing field by supporting better teacher preparation and qualifications, as well as establishing sequential learning experiences.

One of the challenges is coordinating traditional education programs with PreK-3 programs. First, the need to coordinate education programs (curriculum, professional development, teacher collaboration, school facilities) becomes more complex with the addition of more staff, students, and grade levels. An efficient way to help such coordination is to make preschool teachers part of a PreK-3 teacher collaborative team. Second, many preschool programs are offered by providers other than the public-school system – frequently at sites other than the local school. Finally, coordinating preschool with the regular K-3 program is further complicated by the fact that in the foreseeable future, preschool programs will remain voluntary. This means some children will continue to come to kindergarten without the benefit of preschool programs, and other children who have had access to preschool programs will bring very different experiences – both behavioral and academic – to the first years of formal schooling.

As part of a study to estimate costs for PreK-3 programs nationwide, Picus, Odden and Goetz (2009) produced case studies of several integrated, PreK-3 preschool programs. The case studies showed that such programs:

- Are provided in regular elementary school settings
- Are often organized into PreK-1, grades 2 through 3, and grades 4 through 5 collegial teacher teams
- Provide preschool teachers with the same pupil-free time as the grade level elementary teachers so they can all meet during the regular school day for collaborative planning
- Integrate the preschool through grade one curriculum
- Generally, augment a K-5 elementary school with one to three additional preschool classrooms.

Most of the preschool classrooms were staffed with one teacher and one aide for every 15-20 students. In addition, and as recommended by the NIEER standards, PreK programs had classroom teachers that were fully certified as early childhood educators and paid on the same salary schedule as the other teachers in the school district, another factor of preschool program quality (Camilli, et al., 2010; Whitebrook, 2004).

<u>Effects of Full Day Versus Half Day Preschool Programs</u>

Atteberry, Bassok and Wong (2019) reported on a randomized control trial for four-year old children on the effects of a full versus a half day PreK program on student readiness for kindergarten. The half day program operated for four days a week; the full day for five days a week. The full day program provided over 600 more hours of preschool programming over the course of a school. year. The full day program had significantly greater effects including a 0.275 standard deviation impact on children’s vocabulary skills. Full day students also outperformed half day peers on teacher reported measures of cognition, literacy, math and physical and emotional development.

<u>Effects of More Universal Preschool Programs</u>

Beyond analysis of preschool programs created specifically for research on program impact, researchers have analyzed the success of large, more universal, i.e., statewide, preschool initiatives. A 2003 study of state-funded preschool programs in six states—California, Georgia, Illinois, Kentucky, New York, and Ohio—found that children from lower income families start catching up to their middle-income peers when they attend a preschool program (Jacobson, 2003). There is evidence that statewide universal programs in Georgia (Henry, et al., 2006), and Oklahoma (Gromley, Jr. et al., 2005) have improved the performance of students who participated in those programs. Further, a 2007 study showed that preschool programs in New Jersey’s urban districts had not only significant short-term cognitive and social impacts, but also long-term, positive impacts on students who enrolled in them, closing the achievement gap by 40 percent in second grade for a two-year preschool program (Frede, Jung, Barnett, et al., 2007). In part as a result of preschool expansion, Bassok and Latham (2017) found that children entering kindergarten were doing so today with higher levels of academic skills.

Analyses of state preschool programs also show that although preschool effects might appear to dissipate by grade 3, they still have longer-term positive impacts. Two studies of a more "universal" preschool program in Tulsa, Oklahoma, found that a high-quality Head Start program had clear short-term impacts which, tended to dissipate (though not completely and not for all children) by grade three. But the program produced significant positive impacts on participating students several years later in their middle school years, especially for low income and minority children (Hill, et al., 2015; Phillips et al., 2016). The authors argued that the grade 3 "fade" phenomenon, while troublesome, is muted by longer term impacts when the children who participated in the program reached middle school. This suggests evidence that high-quality preschool programs do produce longer term, sustainable results. This conclusion is bolstered by Fisher's 2020 review of the short- and long-term impacts of multiple, high quality preschool programs.

Studies of two current preschool programs in North Carolina also found significant longer-term effects (Bai, et al., 2020). The two programs implemented at scale in North Carolina were Smart Start and More at Four. Smart Start provided state funding to support high-quality early childcare in local communities, and More at Four provided state-funded slots for a year of credentialed Prekindergarten. Funds were allocated for each program at varying rates across counties and years. This variation was used to estimate the long-term impact of each program through eighth grade by measuring the association between state funding allocations to each program, and subsequent student performance. The study reviewed programs in 100 counties over 13 consecutive years. Analyses conducted on nearly 900,000 middle school students indicated significant positive impacts for each program on reading and math test scores in elementary grades, and reductions in both special education placement and grade retention. These impacts did not fade out and seemed instead to grow (for More at Four) as students progressed through middle school. Students from economically disadvantaged backgrounds experienced particularly large benefits from the More at Four Program.

The Washington, D.C. school district expanded free preschool for children aged 3 and 4 in 2008 (Will, 2020). Over the years, the district's percentage of students enrolled in both preschool and kindergarten – 85 percent of 4-year olds and 73 percent of 3-year olds – has been the highest in the nation. When the district expanded its preschool program, it integrated the PreK program fully into the elementary program by aligning the PreK curriculum with the K-3 curriculum, providing professional development and instructional coaches to PreK teachers. The district also paid PreK teachers on the same salary scale as other district teachers. These actions are all elements identified above for high quality preschool programs and are included in the EB PreK model. The Washington, D.C. school district has had one of the most improved urban education systems in the entire country over the past decade.

Summary

In sum, these studies and program initiatives have found that high-quality preschool programs, offered for a *full day* and taught by *fully certified and trained teachers* using a rigorous, and appropriate early childhood curriculum, can provide initial positive effects, even greater effects in later primary years and on into middle school, as well as positive impacts into adulthood. By themselves, preschool programs can reduce achievement gaps linked to race and income by half. And the effect of preschool programs can be enhanced if followed by high-quality education programming in the elementary grades, particularly grades K-3. Moreover, there is increasing recognition that preschool is beneficial for *all students*. For example, a 2004 study showed that this strategy produced not only large impacts for students from lower income backgrounds but also for children from middle class backgrounds (Barnett, Brown & Shore, 2004).

Finally, as the conditions of families and children have become more perilous – and the social and emotional needs of children have increased, research supports the positive effects of preschool programs to help young children cope with these challenges (Murano, Sawyer and Lipnevich, 2020). These findings show that preschool programs can not only impact the academic and long-term job-related skills of children, but also their social and emotional skills, helping them to weather challenging situations at both school and home.

Fiscal Returns to Preschool

Generally, estimates of the long-term financial benefits of preschool programs are reported as returns on investment. The reasons high quality early childhood education programs have positive returns on investment, or positive benefit-cost ratios, are that preschool programs reduce the need for costly social and education programs as a child grows older and increase incomes when the participants become adults. In a 2017 meta-analysis of 22 high quality experimental and quasi-experimental studies conducted between 1960 and 2016, McCoy et al. (2017) found that preschool programs had statistically significant impacts on reducing special education placement (effect size of 0.33 SD or 8.1 percentage points), grade retention (effect size of 0.26 or 8.3 percentage points, and on-time high school graduation rate (effect size of 0.24 or 11.4 percentage points). Other studies show similar positive impacts on increased labor market participation, higher salaries, lower incarceration rates, and less use of social welfare programs. The results add up to significant returns on investments to high quality preschool program.

Reynolds and Temple (2008) reported that in addition to benefits to child well-being and student achievement, high-quality preschool programs for low-income children at-risk for underachievement produced economic returns ranging from $4 to $10 per dollar invested. Others make similar arguments. Several studies conclude that there is a return over time of eight to ten dollars for every one dollar invested in high-quality preschool programs (Barnett, 2007; Barnett & Masse, 2007; Barnett & Frede, 2017; Karoly et al., 1998; Reynolds et al., 2011; Zigler, Gilliam & Jones, 2006; and Gromley, 2007). Fisher's 2020 review concluded that returns to preschool programs range from $2 to $13 per dollar invested.

In a more detailed analysis, Lynch (2007) found that voluntary, high-quality, publicly funded preschool programs targeted to the poorest 25 percent of three-and four-year old children generate substantial benefits that would eclipse the costs of the programs in six years. By 2050, Lynch estimated that the annual benefits of these preschool programs would exceed the program costs in that year by a ratio of 12 to 1. He estimated the cost of a high-quality half-day program at $6,300 (2006 dollars) for each of the 2 million children enrolled. He further estimated that if programs were funded by individual states (rather than the Federal Government), by 2050, all 50 states would realize net benefits in tax revenues from the programs in between four and 29 years.

Lynch (2007) estimated that if a voluntary, high-quality publicly funded universal half-day preschool program for three-and four-year-olds were established, budgetary savings would surpass costs in about nine years and by 2050, benefits would exceed costs by an 8.2:1 ratio. He assumed these preschool programs would also cost approximately $6,300 (2006 dollars) per student and when fully phased in would enroll approximately seven million children.

The EB Approach for Providing Integrated Preschool Programs

The EB approach has been used to identify costs for integrated preschool programs in three recent studies. The first was a study Picus Odden & Associates conducted for The Fund for Child Development, that developed estimated costs for providing PreK-3 programs, in all 50 states and the District of Columbia (Picus, Odden & Goetz, 2009). The study estimated PreK-3 program costs for each state using varying assumptions of student eligibility and participation. The second was a study conducted in 2011 as part of an adequacy study for Texas (Picus, Odden, Goetz & Aportela, 2012). The third was an analysis conducted for Maine as part of a 2013 recalibration of its adequacy-oriented school funding system (Picus et al., 2013). In these three studies, the EB Model was used to develop a per pupil cost for a high-quality preschool program by identifying the necessary program elements.

The EB model includes full-day preschool for 3- and 4-year-olds, with priority for funding given to children from families with an income at or below 200 percent of the poverty level, although we would recommend universal preschool.

Table 4.1.1 shows the estimated cost of a single PreK student with teacher salaries at 75 percent of professional salaries in Wyoming and technology costs at $250 per ADM. The table provides the staffing resources and dollar per pupil costs for a PreK program assuming PreK classes of 15 students. It should be clear that these elements draw from the elements and ratios that the EB Model provides for all elementary schools. The major difference is that for all preschool classes the EB Model provides one teacher position *and* one instructional aide position for every 15 preschool students. Panel 1 of Table 4.1.1 shows the estimated cost with a class size of 15 and related fractional allocation of costs for other support personnel. Panel 2 of Table 4.1.1 shows the non-personnel resources per pupil for a PreK student and the Third panel estimates the costs of central office resources for a PreK student. Central Office Resources are the hardest to estimate because the EB model allocates different levels of resources to school districts based on enrollment and takes advantage of economies of scale in the provision of centralized resources. As a result, the estimate for central office resources would vary depending on a district's enrollment. The calculation provided in panel 3 of Table 4.1.1 represents the state-wide average and would provide an accurate estimate of PreK costs if the funding model provided resources for all PreK students. In actuality, districts with lower enrollments would likely receive slightly higher per pupil funding for PreK and larger districts somewhat less per pupil.

Table 4.1.1: Estimated Evidence-Based Cost for a PreK Student (Teacher Salaries at 75th Percentile; Technology at $250 per ADM)

Staffing Resources	Est. FTE	Salary Cost*	Benefits	SY 2020-21 Health Insurance	Est. Comp.	Est. Cost without RCA
Core Teachers	0.067	$54,500	$11,516	$18,298	$84,314	$5,621
Elective Teachers	0.013	$54,500	$11,516	$18,298	$84,314	$1,124
Pre-K Instructional Aides	0.067	$22,700	$4,797	$18,298	$45,795	$3,053
Instructional Facilitators	0.005	$54,500	$11,516	$18,299	$84,315	$439
Nurses	0.001	$54,500	$11,516	$18,298	$84,314	$112
Assistant Principal	0.003	$84,900	$17,939	$18,298	$121,137	$421
Computer Technician	0.002	$50,500	$10,671	$18,298	$79,469	$126
Secretary	0.003	$33,600	$7,100	$18,298	$58,998	$205
Clerical	0.003	$31,900	$6,740	$18,298	$56,938	$198
Counselors	0.003	$54,500	$11,516	$18,298	$84,314	$293
Substitute Teachers	0.005	$106	$8		$115	$1
Sub-Total	**0.177**					**$11,592**

Non-personnel Resources	Amount Per Pupil	Est. Cost
Professional Development	$130	$130
Instructional Materials	$210	$210
Formative Assessments	$25	$25
Technology ($250 $ 3:1; $350 at 1:1)	$250	$250
Sub-Total	**$615**	**$615**

District Level Resources	Amount Per Pupil	Est. Cost
Central Office Resources	$1,033	$1,033
Estimated Total Cost		**$13,239**

Table 4.1.2 estimates the per pupil costs of PreK programs under alternative assumptions for teacher salaries (75% or 85% of professional salaries in Wyoming), and the per pupil costs of technology ($250 or $350 per pupil). The two tables show that depending on policy decisions made regarding teacher salaries and technology resources, PreK programs would cost between $13,239 and $14,124 per pupil, subject to the central office caveat describe above.

Table 4.1.2: Estimated EB PreK costs per pupil under alternative assumptions

Assumptions	Per Pupil PreK Cost Estimate
Teachers @ 75th Percentile; $250 for Technology	$13,239
Teachers @ 75th Percentile; $350 for Technology	$13,339
Teachers @ 85th Percentile; $250 for Technology	$14,024
Teachers @ 85th Percentile; $350 for Technology	$14,124

Response to Select Committee Questions About PreK at the September Meeting

During the discussion of Preschool, or Prekindergarten (PreK), at the September 9, 2020 meeting of the Committee, we were asked if there was research on the effectiveness of various options for providing PreK and Kindergarten programs including:

a. A half day PreK program followed the next year by a half day Kindergarten program. Behind the question was the issue of whether a reduction of full day Kindergarten to a half day program, coupled with the "saved" funding providing a half day of preschool the year before Kindergarten, would be more or less effective than a full day Kindergarten program.

b. A single semester of full day PreK versus a full year of half day PreK.

c. In addition, we were asked whether there were strategies to creatively fund PreK by merging federal Head Start, IDEA and ESSA funding, and state/local PreK funding.

As discussed above, the main findings of research on PreK programs are that high quality, full day PreK programs had substantial positive impacts on student performance, including longer term performance in elementary, middle and high school, as well as success in postsecondary education and the job market. The report also found that full day PreK programs had larger impacts on student performance than half-day programs.

To help answer the above questions, we reached out to W. Steven Barnett, who is the Board of Governors Professor and Senior Co-Director of the National Institute for Early Education Research (NIEER) in the Graduate School of Education at Rutgers University, the state university of New Jersey. Barnett is acknowledged to be one of the country's top experts on PreK programs having co-directed the NIEER for well over a decade. Moreover, the EB Model's PreK programs meets all the NIEER's standards for a high quality PreK program.

The Duration of PreK Programs

Barnett's take on comparing the effects of the duration of preschool programs (half versus full day) was that the effects can be an even trade with no net gain. Having said that, he continued, the effects depend on what programs do with the second half of the day. The NIEER conducted a study in Chicago where the shift from half to full day produced no increased effects but it was clear that the teacher view was "we now have a full day to do what we did in a half." If the full day program provided students with just a lunch and nap, there clearly was not much gain. This non-impact result was at odds, though, with the bulk of the research showing that full day PreK programs are more effective than half day programs.

The other complication in comparing full to half day programs is that some children do not attend half day programs because their parents need full-day child-care and cannot manage shifting their children mid-day. Barnett said that he did not know the employment patterns of low-income parents in Wyoming, so could not comment on how this would play out in Wyoming

In general, Barnett was not sanguine about substituting half day for full day programs, either for PreK or Kindergarten programs, and could not cite any research on the specific question of whether a half day PreK for a full year followed by a half day Kindergarten program the next year would be more or less effective. But he was skeptical.

He also said that there is not much known about a single semester of PreK, though there is a history of research on shorter-term programs beginning with summer Head Start that shows disappointing results (which is why the summer-only Head Start program was discontinued). His professional conclusion, after studying PreK programs for decades, was that that even a single year is a risky approach to producing large lasting gains. Although there are some one-year programs that have shown lasting impacts (e.g., North Carolina More at Four) most of the studies that have found large lasting effects have been on programs that run for at least two years. His conclusion was that in order to produce big, significant gains, PreK programs probably need to be provided for at least two years, starting at age 3.

Recognizing that two years of PreK costs more than one year, he stated that it would better to target the most disadvantaged children (in terms of poverty concentration) and give them two years of a high quality PreK program than serve twice as many students who are less disadvantaged on average for 1 year. And he referenced, but did not give a citation for, a study under review that could support that conclusion.

Moreover, it also has to be taken into account that there is evidence that saturation (all students getting PreK) in communities or school districts with high levels of need is another element that contributes to long-term impacts. In particular, schools need to be able to shift their teaching in grades after preschool, starting in kindergarten and moving up, to take advantage of the preschool gains. As an example, several years after it had implemented a full-day two-year PreK program for all children, Union City New Jersey, a district in which all children qualified for free lunch, eventually moved Algebra I down from 9th grade to 7th grade, reflecting large, long term gains in student mathematics performance.

Creative PreK Funding

Barnett was optimistic about Wyoming's tapping several federal sources for funding for PreK programs in ways that could allow the state to serve a quarter to a third of its students, that is those at the bottom of the income distribution.

One such program is Head Start. Currently, 11 percent of Wyoming's children age 4 are served in a Head Start Program. It would be possible to enhance Head Start funding if the state targeted children age 3 as well.

A second funding option is the "delay" option for preschool under current provisions of the Federal IDEA program, both IDEA Part B and Part C. Although IDEA primarily provides federal dollars to serve students with disabilities, the "developmental delay" option provides a mechanism to serve children age 3 and 4 with a preschool program without having them identified as having a specific disability. The following, taken from Contemporary Practices in Early Education (https://www.teachingei.org/disabilities/primers/Developmental_Delay.pdf), explains this option more fully:

> Generally, a developmental delay (DD) is defined as slow to meet or not reaching milestones in one or more of the areas of development (communication, motor, cognition, social-emotional, or, adaptive skills) in the expected way for a child's age. The child's slow development may *not* be associated with a condition or a specific diagnosis. Under IDEA a child with a developmental delay may be eligible to receive early intervention or special education and related services if they meet certain federal and/or state criteria.
>
> Under Part C of IDEA, early intervention, each state determines the definition of developmental delay for children under the age of 3 years (IDEA 2004, §632(5)(A)). A child with an existing diagnosed physical or mental condition that has a high probability of resulting in a developmental delay qualifies for early intervention (IDEA 2004, §632(5)(A)). Other children – *without a specifically identified condition* – who demonstrate a delay as determined by each state may also be eligible to receive early intervention services, such as preschool. For example, the state of Alaska and the District of Columbia have defined developmental delay as a 50% delay below the age of the child in one or more of the five areas of development. Other states vary in their definition from 25% delay in one or more of the developmental areas to using set standard deviations from the norm in one or more areas of development. IDEA, Part C gives States the option to include children who are at risk for developmental delay but do not meet their eligibility criteria into their early intervention programs. This is an option but not a requirement under IDEA, Part C.

> Part B of IDEA gives states the option to use a definition of developmental delay *in addition to specific disability categories* in order to determine eligibility for special education and related services for children in school. States are able to use this definition with children three to nine years of age, or a portion of this age range if they choose. States are not required to use developmental delay to determine eligibility for special education and related services. For states that use a definition of developmental delay under Part B, children may qualify for special education and related services using a state determined definition. This definition may be different than the one used in Part C. The delay must be determined by assessing the child using appropriate developmental tests or tools. Many states, including Alaska and the District of Columbia, use different terms and definitions of developmental delay for children over the age of three years. Alaska uses the term "early childhood developmentally delayed" in children ages three through eight and defines this delay as 2 standard deviations or 25% delay in one or more area of development or 1.7 standard deviations or a 20% delay in two or more areas of development. The District of Columbia uses the term "developmental delay" for children ages three through seven and defines this as a child experiencing delays of at least two years below their chronologic age and/or 2 standard deviations below the mean in one area of development. The District of Columbia also has a restriction in using developmental delay. No child can be classified as having a developmental delay based solely on deficits in the area of social or emotional development. Additionally, the jurisdiction only uses the term after considering other disability categories to determine eligibility for special education and related services.

Wyoming is unusual in already substantially tapping the "delay" options to serve children in PreK programs. According to Barnett, Wyoming currently enrolls 14 percent of four-year olds in a preschool program, and 10 percent of three-year olds. These percentages are the highest in the nation. So, the state already has begun to tap this mechanism for funding preschool programs, and with more effort, probably could expand such resources.

Further, the federal Every Student Succeeds Act (ESSA) for a while provided specific funding for PreK programs for four-year old children from low income backgrounds. Enacted in December of 2015, ESSA, for the first time, incorporated early learning across the law. Although ESSA's predecessor, the No Child Left Behind Act of 2001, permitted grantees to make early learning investments, ESSA significantly elevated early learning's importance in the law by promoting service coordination within communities; encouraging greater alignment with the early elementary grades; and building early childhood education knowledge and capacity among teachers, leaders, and other staff serving young children. ESSA also included the first-ever dedicated funding stream for early childhood education (ECE) with the new Preschool Development Grant Birth through Five program (PDG B-5).

PDG B-5 provides competitive grants, now managed jointly by the U.S. Department of Health and Human Services, for states to improve coordination, quality, and access for early childhood education, or PreK programs. However, PDG can no longer be used to expand access to PreK programs but can be used for planning and coordination.

In short, several federal education funding programs – Head Start, Parts B and C of IDEA, and PDG B-5 of ESSA – provide funds for states to plan, create and operate preschool programs for children age 3 and 4 from low income backgrounds. Barnett suggests that by fully tapping these resources, Wyoming could provide preschool programs potentially up to between 25 and 33 percent of students in Wyoming, starting with those from the lowest income families.

Barnett also suggested that West Virginia offers a model for combining all of the above funding sources into one, integrated state program. West Virginia used this approach as it began the process of providing a more universal PreK program, in part because a large portion of its families had low incomes, so their children were eligible for these Federal programs. Barnett concluded that what West Virginia did shows how a state can effectively combine all of the federal programs into one integrated program, with each of the partners remarkably pleased with how the overall program works. He believes this could be a fruitful option for Wyoming, as it could possibly enroll the lowest 25-33 percent of students by family income in a PreK program for two years without spending much more money. IDEA would have to be part of it.

Finally, as Wyoming contemplates these options, it should also consider the fact that it already provides and funds full day Kindergarten. And many districts have created multiple versions of a "pre-kindergarten" program *for children aged five* but who are not ready – socially, emotionally, behaviorally or academically – for a "regular" Kindergarten program. If the state formally seeks to expand its PreK programs tapping the above federal revenue sources, it should also integrate these "pre-kindergarten " programs for five-year olds, thus producing an integrated and sequenced 2-3-year PreK program for children aged 3-5, preparing them to successfully enter a formal, regular Kindergarten program. The state can play an important role by facilitating partnerships between districts and private providers that support full use of all of the human, facilities, and financial resources that already support various aspects of the care and education of young children with a focus on enhancing learning and development.

School Safety and School Resource Officers

In our 2015 recalibration report, after researching the need for and use of School Resource Officers (SROs), we concluded that funding for school SROs was not needed in the funding model because law enforcement agencies estimate the number of officers needed in their jurisdiction on the basis of numbers of officers per unit of total population that includes children (i.e. two officers per 25,000 residents). We noted that during school hours a substantial percentage of that population was attending schools and that the resources of the law enforcement agency should therefore be available to meet the safety needs of the schools. Specifically, we concluded "… at this point we would recommend that the state cautiously wait until moving on a strategy to cost share SROs in school districts. This function actually is a function of the local police and sheriff departments and should be provided and funded largely by those agencies."

In the time since the last recalibration, the news has been filled with frequent cases of school shootings and other safety incidents in schools leading to the need to revisit the issue of school safety, specifically whether there is a need to provide SROs in Wyoming's schools through the school funding formula. Today, Wyoming school districts that choose to employ SROs in their schools typically contract with local law enforcement agencies for SRO services and, in at least one Wyoming district, smaller schools may have one or more teachers with a concealed weapon permit. These teachers receive specialized professional development and training to prepare them for an active shooter event. The Wyoming School Resource Officers Association provided us a roster with 49 members. These 49 SROs are employed by 20 different police or sheriff departments and serve in 18 school districts. Twenty-eight officers are located in high schools, 14 in middle or junior high schools and seven in other schools that are either elementary or K-12 school buildings.

The WDE surveyed all 48 school districts in September 2020 for information on SROs. The results of the survey are summarized in Appendix 4.3.A below. Overall, 34 districts provided information on SROs, with 30 indicating they have SROs available in the district. Few of the districts appeared to have full time SROs at single schools, and there were a range of approaches for paying local law enforcement agencies (police or sheriff departments) for SRO services.

Below we provide data on the incidence of school violence and summarize research on the effectiveness of SROs in schools. At present, other than the Wyoming School Resource Officers Association membership, there is little statewide data on the use of SROs, or alternative safety resources.

Analysis and Evidence

A general review of school safety shows that in recent years there has been increasing pressure on school districts to provide SROs in schools, particularly high schools because of the increased incidence of school shootings. However, since May 2020 a second trend has emerged suggesting that armed law enforcement officers are not the only option, and that enhanced counseling services, including counselors with a specific charge to help improve safety, can also be effective. Moreover, in recent months, several school districts throughout the country have either reduced or eliminated funding for their own law enforcement agencies. This section provides data on the incidence of violence in schools, describes current research on the effectiveness of alternative staffing strategies (SROs compared to counselors), and summarizes what is known about the reasons some large school districts are changing their policing policies.

Incidence of School Violence and Presence of SROs

The most recent report on the incidence of crime and violence in public schools in the United States comes from the School survey on Crime and Safety, 2017-18 (Dillberti, et. al., 2019). The survey results identified an estimated 962,300 violent incidents and 476,100 nonviolent incidents in school year 2017-18. The report indicates that 71 percent of schools across the country reported having at least one violent incident, and 65% reported at least one nonviolent incident. Dillberti, et. al. also estimated that there were 3,600 incidents nationwide that involved the possession of a firearm or explosive device at a school in 2017-18.

Table 4.2.1 displays data on the incidence of violent incidents in schools by type of school and enrollment. The data show that there were firearm or explosive device incidents in an estimated 3.3 percent of public schools in 2017-18, for a total of approximately 3,600 incidents in 2,700 schools. Although this represents 3.3 percent of all public schools, most incidents occurred in high schools and larger schools with approximately 9.6 percent of high schools and 10.8 percent of schools with enrollments over 1,000 reporting incidents of possession of a firearm or explosive device. The rate of these incidents per 1,000 students never exceeded 0.1 or no more than one incident per 10,000 students.

Table 4.2.1 Estimated Number and Percent of Schools with Recorded Incidents of Possession of a Firearm or Explosive Device by Level and Enrollment Size in the United States: 2017-18

School Characteristic	Possession of a Firearm or Explosive Device			
	Number of Schools	Percent of Schools (%)	Number of Incidents	Rate per 1,000 Students
All Public Schools	2,700	3.3	3,600	0.1
Level				
Primary	*	1.3	*	#
Middle	600	4.3	1,000	0.1
High School	1,200	9.6	1.700	0.1
Combined	*	*	*	*
Enrollment Size				
Less than 300	*	0.9	*	0.1
300-499	*	2.2	*	0.1
500-999	1,100	3.3	1,300	0.1
1,000 or More	1,000	10.8	1,500	0.1
Locale				
City	1,400	6.2	1,800	0.1
Suburb	700	2.4	900	#
Town	*	3.2	600	0.1
Rural	*	1.5	*	#

*Too few cases to report or standard error exceeds 50 percent of the estimate
Rounds to zero
Source: Dillberti, et. al. 2019. Table 4, p. 10

Table 4.2.2 provides a summary of the estimated number of schools with SROs across the United States to help protect individuals in schools; 44.8 percent of public schools reported the presence of SROs at least once a week, 13.2 percent of public schools indicated the presence of other sworn law enforcement officers at least once a week, and 22.3 percent of traditional public schools reported there was a security guard present at least once a week. Overall, 24.4 percent of public schools reported the presence of a full-time SRO in 2017-18. The table shows that high schools and schools with more than 1,000 students are most likely to have SROs or other security personnel assigned on a full-time basis.

Table 4.2.2. Estimated Percentage of Public Schools with One or More Full-Time or Part-Time SROs, Other Sworn Law Enforcement Officers, or Security Guards

School Characteristic	School Resource Officers (SROs)[1]			Other Sworn Law Enforcement Officers[2]			Security Guards or Security Personnel		
	Total (%)	FT (%)	PT (%)	Total (%)	FT (%)	PT (%)	Total (%)	FT (%)	PT (%)
All Public Schools	44.8	24.4	21.9	13.2	4.7	8.8	22.3	16.3	9.2
Level									
Primary	33.7	13.8	20.6	11.3	2.8	8.6	16.6	10.2	8.0
Middle	65.4	38.0	29.6	15.6	5.8	10.2	24.3	18.8	8.7
High School	69.5	53.1	20.7	19.4	10.3	10.3	42.5	37.9	13.0
Combined	31.3	16.2	16.3	9.7	5.8	3.9	20.5	13.6	11.8
Enrollment Size									
Less than 300	31.8	13.8	18.8	12.4	3.4	9.2	12.0	7.4	4.9
300-499	35.9	16.4	20.2	10.6	2.1	9.0	17.5	13.7	6.7
500-999	49.7	25.9	25.5	14.6	6.3	8.5	22.8	14.8	10.9
1,000 or More	77.3	62.1	20.0	17.3	9.4	8.6	53.2	45.6	18.5
Locale									
City	39.5	24.1	17.5	11.1	5.5	6.0	33.8	26.6	11.8
Suburb	47.0	23.8	24.5	14.5	5.3	9.5	25.1	18.5	10.5
Town	56.4	28.9	29.0	16.1	7.0	9.3	12.8	8.0	5.9
Rural	42.0	23.4	19.8	12.5	2.1	10.7	11.6	6.9	6.4

[1] SROs are defined as career sworn law enforcement officers with arrest authority, who have specialized training and are assigned to work in collaboration with school organizations.
[2] Includes all sworn law enforcement officers who are not SROs.
Source: Dillberti, et. al. 2019, Table 11, p. 18

The school size and school level pattern identified in Table 4.2.2 carries over into the likelihood that an SRO or other law enforcement officer is likely to carry a firearm. Table 4.2.3 shows the percentage of all schools and the percentage of schools with an SRO or sworn law enforcement officer who carry firearms, physical restraints, chemical aerosol sprays or wear a body camera. The table shows that 46.7 percent of all schools have an SRO or law enforcement officer who carries restraints, and that 91.1 percent of SROs or sworn law enforcement officers in schools carry a firearm. The percentage of SROs carrying firearms is consistent among school levels except for combined schools where 74.3 percent of SROs have firearms. The percentage of SROs who carry firearms increases with school size generally. Although somewhat surprisingly, the percentage of SROs or sworn law enforcement officers who carry firearms is lower in the city than in other locales, with the highest percentage of such individuals having firearms in suburban schools.

Table 4.2.3 Estimated Percentage of Public Schools Reporting That SROs or Sworn Law Enforcement Officers Engage in Specific Practices, School Year 2017-18

School Characteristic	Percentage of Schools with an SRO or Sworn Law Enforcement Officer Who Routinely:							
	All Schools (%)				Schools with an SRO or Sworn Law Enforcement Officer (%)			
	Restraints	Spray	Fire-arm	Body Cam-era	Restraints	Spray	Fire-arm	Body Cam-era
All Public Schools	46.7	36.0	46.7	16.7	91.2	70.4	91.1	32.6
Level								
Primary	35.2	25.7	36.0	12.3	87.8	64.0	89.9	30.6
Middle	67.1	54.5	67.6	25.0	93.8	76.2	94.5	34.9
High School	74.0	59.5	72.0	27.5	96.8	77.8	94.2	35.9
Combined	31.5	24.5	27.5	9.1	85.2	66.3	74.3	24.6
Enrollment Size								
Less than 300	34.9	25.3	34.4	12.6	91.3	66.2	89.9	33.1
300-499	35.0	26.7	36.0	12.5	85.9	66.5	88.2	30.6
500-999	52.9	41.2	52.4	18.4	91.8	71.5	91.0	31.9
1,000 or More	79.8	64.2	79.4	30.2	97.1	98.1	96.7	36.7
Locale								
City	39.1	28.3	36.0	13.2	88.2	64.0	81.3	29.7
Suburb	49.7	38.5	51.0	17.0	93.2	72.2	95.6	31.8
Town	58.1	45.9	59.4	25.1	90.1	71.2	92.1	38.9
Rural	45.4	36.2	46.1	16.0	92.2	73.4	93.6	32.4

Source: Dillberti, et. al. 2019, Table 12, p. 19

As noted in the introduction to this section, there is also strong support for providing counselling and mental health services for student to help prevent incidents of violence in schools. Table 4.2.4 displays the number and percentage of schools providing mental health services to students. The table shows that just over half of all public schools offer students mental health assessments, and just over 38 percent also have treatment services available, either at the school site, at an alternative location, or both. A higher percentage of larger schools and schools in cities provide mental health services than in other schools or locales.

Table 4.2.4 Estimated Number and Percentage of Public Schools Providing Mental Health Services to Students

School Characteristic	Schools Providing Mental Health Services			
	Diagnostic Mental Health Assessments		Treatment	
	Number	Percent (%)	Number	Percent (%)
All Public Schools	42,200	51.2	31,500	38.3
Level				
Primary	23,500	48.7	17,800	36.9
Middle	8,400	55.7	5,900	39.1
High School	7,700	60.8	5,600	44.5
Combined	2,600	41.2	2,200	34.6
Enrollment Size				
Less than 300	7,300	43.2	5,800	34.5
300-499	12,200	49.0	10,000	40.3
500-999	17,000	53.7	11,800	37.2
1,000 or More	5,700	64.0	3,900	44.0
Locale				
City	13,100	58.4	9,400	41.7
Suburb	14,400	52.9	9,700	35.7
Town	4,900	46.3	4,300	40.5
Rural	9,700	44.3	8,200	37.1

Source: Dillberti, et. al. 2019, Table 13, p. 21

Research on Effectiveness of SROs

Research on the impact of SROs in schools on student outcomes is extremely limited. To date, only one study of the impact of school police on student outcomes appears to have been completed. Other research has analyzed the effectiveness of SROs compared to enhanced counseling services for students to reduce the incidence of school crime. This analysis will focus on the incidence of violent crime in schools.

Weisburst (2019) was the first to conduct a study on the impact of funding for school police on student outcomes. Using data on Federal grants for school police, Weisburst analyzed data on over 2.5 million students in Texas and estimated that Federal grants to provide police presence in schools had little impact on disciplinary rates in high schools, but found that the three year presence of school police in high schools led to a 2.5 percent *decrease* in high school graduation rates and a four percent *decrease* in college enrollment rates. He concluded that negative school discipline experiences resulting from more exposure to school police could also shape the way students are perceived by teachers, school administrators, and peers, and might also impact a student's confidence and attachment to school with the potential of lowering student performance.

Owens (2017) considered the impact of federal SRO grants on the school-to-prison pipeline, analyzing the impact of changes in police hiring on arrests in and out of school for students of different ages using national data. He found that law enforcement agents in schools learn more about crimes in those schools and subsequently make more arrests. Owens found that law enforcement officers increased school safety; the presence of an officer was associated with a 1.1 percent to 1.9 percent reduction in disruptive criminal incidents in a school. However, Owens noted that this increase in safety was not free; it was accompanied by a small increase in the probability that students who continued to engage in disruptive and harmful behavior would come into contact with the formal criminal justice system, rather than the principal's office.

Fischer, et. al. (2019) analyzed different types of SRO profiles and noted that reactionary SROs (SROs called to a school site in response to a reported incident) tended to report more crimes than low impact or full-time SROs, suggesting that strategies for full time SROs could be an effective tool for reducing the incidence of violence in schools. However, the findings, similar to those of Nance (2015), found that police officers at schools was predictive of greater odds that students would be referred to law enforcement, particularly for low level offenses. Nance suggested that Lawmakers and school officials should consider alternative methods to create safer learning environments instead of using their limited resources to hire more law enforcement officers to patrol school grounds. If lawmakers and school officials do rely on police officers to protect students, police officers and school officials should receive more training regarding how to appropriately discipline students and, additionally, enter into memoranda of understanding to avoid unnecessarily involving students with law enforcement for lower-level offenses.

In a recent survey of over 106,000 Virginia high school students, respondents indicated that nearly 70 percent of high school students felt safer at school when there was an SRO present (Breen, 2020). On the other hand, in other parts of the United States there has been a movement in some large school districts to reduce or eliminate funding for school police. Despite this support from students, during the summer of 2020, four major school districts voted to end the use of SROs in their schools. Portland, OR, Seattle, Denver, and Minneapolis school boards all voted to eliminate SROs in their schools, while the Los Angeles school board voted to reduce funding for the district's police department by approximately one-third for the 2020-2021 school year.

We reviewed media sites to attempt to understand why these actions were taken – in Portland, Seattle and Minneapolis the relationship with the local police department was ended. Media descriptions indicated the actions were in response to the death of George Floyd in Minneapolis and the unrest that followed. It is unknown at this time how the districts intend to use the resources formerly dedicated to SROs.

In summary, what is known about the presence of SROs in schools is that there is a slight uptick in the number of crimes reported in a school with SROs, and a greater likelihood that students will be charged with a minor crime and entered into the criminal justice system, slowing their academic progress and performance. This effect, although relatively small, needs to be considered along with the perception and reality of additional security at the school in the face of a major violent incident. The major impact of SROs seems to be a reduction in less violent crimes but a greater reporting of those crimes to law enforcement rather than students being disciplined through their school district's disciplinary process. There is only one study to date on the impact of this shift on student performance Weisburst (2019), which suggests SROs may have a slight detrimental impact on student performance.

Cost of SROs in Wyoming

As indicated above, the Wyoming School Resource Officer Association identified 49 SROs in 18 school districts. In addition, a WDE survey of all 48 school districts in September 2020 showed that overall, 34 districts provided information on SROs, with 30 indicating they have SROs available in the district. Few of the districts appeared to have full time SROs at single schools, and there were a wide range of approaches for paying local law enforcement agencies (police or sheriff departments) for SRO services. A summary of the responses is shown in the Table 4.2.A in the Appendix to this chapter.

A review of contracts between three large school districts and their local law enforcement jurisdictions indicated that districts contract for both the service time of SROs and for their professional equipment to support their law enforcement work at the school. The contracts we reviewed showed that districts paid for 70 to 75 percent of the law enforcement officers' time, approximately equating to the hours and months students are in school. This amounted to a total of $60,000 per SRO for salary and benefits. Districts also paid an additional $14,000 for equipment and support for each SRO.

To estimate the cost of SROs (or alternatively additional counselors), we use a figure of $75,000 per year per SRO, an amount not significantly different from the cost of a school counselor should a district choose to that approach instead.

Assuming the state were to support SROs in schools, the question would be how would resources be allocated? Choices would need to be made about the size and level of school to support. Table 4.2.5 shows the total cost to the state for funding one SRO per school under varying conditions.

Table 4.2.5 Estimated State-Wide Costs of SRO's Under Various Allocation Strategies

Category	Number of Schools	Total State-Wide Cost ($)
High School		
More than 1,000 students	9	675,000
More than 500 students	19	1,425,000
More than 300 students	25	1,875,000
All schools with HS grades and greater than 100 students	75	5,625,000
Middle School		-
More than 500 students	16	1,200,000
More than 300 students	23	1,725,000
Middle and High School		-
High school and middle schools >500	35	2,625,000
High school and middle schools >300	48	3,600,000

As the table in the appendix shows, many districts utilize SROs across multiple schools. This approach could be accommodated in a funding formula as well, most likely by providing support for SROs on a district-wide per-pupil basis. Determining what that funding level is challenging since SROs are only able to provide protection of a violent incident in a school if they are present. If they are at another school at the time of the incident, they may not even be the first responder as other law enforcement officers might be closer to the incident. Development of a formula is further complicated by the use of Federal funds in some districts and contributions of varying levels on the part of local law enforcement agencies in support of some school districts. It is likely not possible to direct districts in the use of their Title IV funds, although theoretically the Legislature could consider funding SROs through law enforcement agencies rather than school districts.

Within the WDE survey, six of the 24 districts that identified school district expenditures for SROs and stated that they used a combination of federal and general funds or all federal funds. A majority of the school districts' general fund expenditures are coded in their central office expenditure function and included in the WDE's CRERW report analysis within the central office non-personnel category.

2020 EB Recommendation

We continue to recommend funding SROs through local law enforcement agencies.

The Legislature could establish a policy to fund the costs of SROs under certain school conditions or sizes. If the Legislature elects to fund SROs, the average cost per SRO is estimated at $75,000. However, if the intent becomes supporting SROs with multiple school assignments, such as with a district-wide per pupil formula, our recommendation would be that the funding continue to be left to law enforcement agencies who would then be responsible for responding to incidents at all schools in a district. If SROs were important, the Legislature could even consider funding local law enforcement agencies to provide SROs, rather than relying on districts to use SRO intended funding through the block grant, for that purpose.

The focus of the EB model is the use of research to identify strategies that will help all students reach their states' outcome expectations. We note that while there is a substantial link between meeting the social and emotional needs of students and their performance in school (see the discussion above on counselors), whereas the little research that exists on SROs and their impact on student performance suggests a very small, but probably negative effect on student performance. The value of SROs may lie in sense of safety they offer. Consequently, our recommendation is that the state should provide more mental health services to students and their families by fully funding all the counselors in the EB model and as appropriate through health departments (City, County and/or State). Only after the critical mental health needs of students should the state fund SROs if it is decided they are needed and the responsibility of the education system and not the law enforcement community.

Appendix 4.2.A.

Table 4.2.A Summary of SRO Data Provided by Districts to WDE, September 2020

District Name	Number of SROs	Schools Served	Jurisdiction Providing Officers	District Payment	Source of Funds	Notes
Albany #1	3	All	Laramie PD	$50,000 per SRO	General Fund	Each SRO appears to have a primary assignment to one of the high schools or Laramie Middle School. Each also has a secondary assignment at other schools in the district
Big Horn #1	1	Rocky Mountain HS	Big Horn County Sheriff	$50,000	General Fund	
Big Horn #2	No Information Available					
Big Horn #3	No Information Available					
Big Horn #4	No Information Available					
Campbell #1	9	All	5 Officers from Gillette PD 4 Officers from Campbell Co. Sheriff	$369,381 $184,708 to Gillette PD and $184,673 to Campbell Co. Sheriff	Shared by all 3 agencies per MOU	Equipment purchase expenditures of $119,000 to Gillette PD and $156,700 to Campbell Co. Sheriff in FUY 2020
Carbon #1	1	All	City of Rawlins	$75,000	Title IV	District pays the city to serve all schools
Carbon #2	No Information Available					
Converse #1	1	Douglas HS	City of Douglas	$30,111	Title IV	
Converse #2	No Information Available					

District Name	Number of SROs	Schools Served	Jurisdiction Providing Officers	District Payment	Source of Funds	Notes
Crook #1	1	All	Crook Co. Sheriff	N/A	General Fund	District reports paying full costs
Fremont #1	2	2	Fremont Co. Sheriff	N/A	Impact Aid from Fremont #14	District pays full cost for 9 months
Fremont #2	1	All	Fremont Co. Sheriff	$25,988 wages $7,600 for supplies, equipment and travel	General Fund	District pays ½ of SRO wages for 10 months, sheriff has asked for district to pay 100% of SRO wages, also budget
Fremont #6	1	1	Fremont Co. Sheriff	Max of $75,000		Up to $75,000 per MOU with Sheriff
Fremont #14	1	All	BIA	N/A	General Fund	Pay for hours worked, BIA officer, but District employee with full benefits
Fremont #21	No Information Available					
Fremont #24	1	1	Shoshoni PD	$25,000	General Fund and Title IV	
Fremont #25	3	All EL MS HS	Riverton PD	$94,900 El $103,998 HS $91,737 MS	General Fund	Invoiced quarterly by City, regular wages plus overtime.
Fremont #38	No Information Available					
Goshen #1	1	Torrington HS	Torrington PD	$20,000	General Fund	SRO serves all schools as needed, primarily the high school
Hot Springs #1	No Information Available					

District Name	Number of SROs	Schools Served	Jurisdiction Providing Officers	District Payment	Source of Funds	Notes
Johnson #1	None					
Laramie #1	7 Officers and 1 sergeant	All	Cheyenne PD and Laramie Co. Sheriff	Not to Exceed $668,500 to Cheyenne PD and $49,500 to Laramie Co. Sheriff	General Fund	Pay City 75% of annual salary and benefits for each SRO, for County 50% of annual salary and benefits. For activities pay SROs hourly.
Laramie #2	No Information Available					
Lincoln #1	None					
Lincoln #2	1	All	Lincoln Co. Sheriff	$52,208	General Fund	
Natrona #1	12	All	Casper PD (10) Natrona Co. Sheriff (1) Evansville PD (1)	Casper PD – 70% of annual salary Natrona Co. – 20 hrs/week for 36 weeks at $46.43/hr Evansville – 48 hours of service	General Fund, Title IV, and Title I N&D Funds	For 10 Casper PD officers, 58% General Fund, 42% Title IV For Natrona Co. 100% Title I N&D For Evansville, 100 % Title IV
Niobrara #1	1	All	Lusk PD	Unknown	General Fund and Title IV	District pays 2/3 of cost

District Name	Number of SROs	Schools Served	Jurisdiction Providing Officers	District Payment	Source of Funds	Notes
Park #1	2	All	Powell PD	District?	General Fund	District pays for F/T SRO for 9 months shared by the MS and HS, Second SRO for Elementary schools
Park #6	2	All	Cody PD	$78,000	General Fund	One position each for MS and HS who “float” to cover Elementary schools
Park #16	No Information Available					
Platte #1	None					
Platte #2	No Information Available					
Sheridan #1	1	All	Sheridan Co. Sheriff		General Fund	83% of salary and benefits plus lump sum of $5,000 for overtime and events
Sheridan #2	2	2	Sheridan PD	$60,500	General Fund	Payment is $30,250 per officer; this appears to be the district contribution
Sheridan #3	No Information Available					
Sublette #1	1 but unclear	All	Sublette Co. Sheriff	None		SRO makes regular appearances at the schools. Budget cuts may lead to expectation that the district will pay a share.
Sublette #9	N/A	N/A	Sublette Co. Sheriff	None		Appears that the Sheriff department pays for Deputies to appear at schools, but no full time SRO
Sweetwater #1	3	3	Rock Springs PD	District pays 50%	General Fund	District is also responsible for overtime for special events
Sweetwater #2	2?	Green River HS and Lincoln MS	Green River PD	No Information Provided		
Teton #1	2	All with primary location at	Jackson PD (1) Teton Co. Sheriff (1)	$65,000 each Total of $130,000	General Fund	Middle school SRO also patrols all schools in town boundaries, HS SRO also patrols all schools outside of town boundaries

District Name	Number of SROs	Schools Served	Jurisdiction Providing Officers	District Payment	Source of Funds	Notes
		the MS and HS				
Uinta #1	2	All	Evanston PD	$50,000 for 2 full time SROs	General Fund	Time Distribution for 2 FTE 85% of one FTE Evanston HS 40% of one FTE at Davis MS 40% of one FTE at Evanston MS 15% of one FTE Horizon Alt. HS 5% of one FTE at Unita Meadows ES 5% of one FTE at Clark ES 5% of one FTE at North ES 55 of one FTE Aspen ES
Uinta #4	No Information Available					
Uinta #6	None					
Washakie #1						
Washakie #2	1	1	Washakie Co. Sheriff	$2,000/year	General Fund	Data suggest this is not a full time SRO
Weston #1	No Information Available					
Weston #7	No Information Available					

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Appendix A
List of Professional Judgment Panel Participants

Name	School district
Sally Wells	Carbon County School District #2
Roxie Taft	Weston County School District #7
Travis Sweeney	Fremont County School District #1
Charles Auzqui	Sheridan County School District #3
Tony P. Gillies	Uinta County School District #6
Shane Ogden	Park County School District #16
Connie Gay	Washakie County School District #2
Tamera J. Britt	Laramie County School District #1
Keri Shannon	Campbell County School District #1
Whitney Fotheringham	Sweetwater School District #1
Rebecca Murray	Laramie County School District #1
Jim Cobb	Converse County School District #1
Clint Mathews	Campbell County School District #1
Karen Wattenmaker	Teton Country School District #1
Rebecca Moser	Converse County School District #1
Craig Anderson	Johnson County School District #1
Darrin Jennings	Carbon County School District #2
Shannon Hall	Laramie County School District #1
Robin J. Porter	Laramie County School District #1
Brad Neuendorf	Fremont County School District #1
Nick Johnson	Weston County School District #7
Sara Reed	Campbell County School District #1
Marty Weber	Fremont County School District #24
Judi Knapp	Laramie County School District #1
Liz Edington	Laramie County School District #1
Susan C Howell	Campbell County School District #1
Teresa Chaulk	Lincoln County School District #1
Casey Bowe	Big Horn County School District #3
Margaret (Annie) Good	Fremont County School District #24
Brian Knox	Campbell County School District #1

Lindy Watt	Campbell County School District #1
Jeremy W. Smith	Sheridan County School District #1
Bertine Bahige	Campbell County School District #1
Amy Jo Paulson	Campbell County School District #1
Lucinda K Kasper	Niobrara County School District #1
Jason Sleep	Park County School District #1
James Ronald Fraley	Laramie County School District #1
Linda Crawford	Weston County School District #7
Carol Johnson	Laramie County School District #1
Brent Notman	Converse County School District #1
Kirby Eisenhauer	Campbell County School District #1
Jay Curtis	Park County School District #1
Christina Mills	Fremont County School District #24
Alex Ayers	Campbell County School District #1
John Weigel	Laramie County School District #1
Liann Brenneman	Laramie County School District #1
Gillian Chapman	Teton County School District #1
Walter T Wilcox	Natrona County School District #1
Mike Hamel	Carbon County School District #1
Cinnamon Dow	Natrona County School District #1
Shannon Harris	Natrona County School District #1
Brent Notman	Converse County School District #1
Brian Edward Cox	Laramie County School District #1
Rose Ann Million Rinne	Laramie County School District #1
Brian Edward Cox	Laramie County School District #1
Linda Evans	Fremont County School District #6
Barney Lacock	Fremont County School District #6
August Nelson	Uinta County School District #1
Mary Jo Lewis	Park County School District #1
Angie Hayes	Natrona County School District #1
Ted Hanson	Natrona County School District #1
Brian Bartz	Carbon County School District #1
Brenton Young	Laramie County School District #1

Jed Cicarelli	Laramie County School District #1
Penny Hawk	Converse County School District #1
Kyle McKinney	Laramie County School District #1
Clinton Elliott	Park County School District #16
Jesse Smith	Fremont County School District #24
Eileen Bentley	Sheridan County School District #2
Mariah A. Learned	Albany County School District #1
Clark Coberly	Weston County School District #7
Kirk Schmidt	Fremont County School District #21
Eric Stremcha	Campbell County School District #1
Elizabeth Joy Fawcett	Laramie County School District #1
Heidi Christensen	Fremont County School District #24
Dr. Karen Delbridge	Laramie County Schoo District #1
Jeff Brewster	Natrona County School District #1
Lee Zimmer	Sheridan County School District #1
John A. Fabela	Park County School District #1
Joel M. Kuper	Big Horn County School District #3
Scott McBride	Park County School District #16
David H. Applegate	Natrona County School District #1
Samantha Knapp	Campbell County School District #1
Eugenia Farinha	Niobrara County School District #1
Necole Hanks	Park County School District #1
Kimberly Amen	Laramie County School District #1
Frankie Medlen	Weston County School District #7
Amy Simpson	Laramie County School District #1
Alberta Oldman	Fremont County School District #14
Boyd Brown	Laramie County School District #1
Wendy Gamble	Converse County School District #1
John Trohkimoinen	Natrona County School District #1
Nikki Lally	Converse County School District #1
Kate Decker	Washakie County School District #2
Martha Gale	Fremont County School District #2
Craig Williams	Laramie County School District #1

Leanna Morton	Park County School District #6
Jared Moretti	Park County School District #6
Nancy Nelson	Big Horn County School District #3
Emily Jarvis	Fremont County School District #24
Lisa Platt	Uinta County School District #1
Tim Herold	Uinta County School District #1
Stuart DesRosier	Big Horn County School District #4
Cassie Hetzel	Hot Springs County School District #1
Eric Jackson	Laramie County School District #1
Joel McKee	Platte County School District #1
Anne Ochs	Campbell County School District #1
Faye Hall	Niobrara County District #1
Jon VanOverbeke	Laramie County School District #1
Kathleen Hampton	Washakie County School District #2
Nikki Erickson	Washakie County School District #2
Jennifer Platt	Fremont County School District #21
Janine Bay Teske	Teton County School District #1
John A. Fabela	Park County School District #1
Meda Warbis	Weston County School District #7
Sara McGinnis	Sheridan County School District #1
Annie Humphrey	Laramie County School District #1
Scott Crisp	Teton County School District #1
Lori Eggleston	Carbon County School District #1
Sheryl Ann Epp	Fremont County School District #6
Alesia (Lisa) Robison	Sweetwater County School District #2
Tim Foley	Park County School District #6
Stephanie Boren	Hot Springs County School District #1
John Corbin	Park County School District #6
Kimberly Dike	Campbell County School District #1
Ralph Wensky	Big Horn County School District #3
Katie Kruse	Niobrara County School District #1
Vickie L. Overcast	Washakie County School District #1
Bryce Cushman	Platte County School District

Dennis Holmes	Campbell County School District #1
Brandon Crosby	Campbell County School District #1
Chad Bourgeois	Campbell County School District #1
Hilary Gore	Goshen County School District #1
Samantha Burr	Campbell County School District #1
George Mirich	Niobrara County School District #1
Andrea Gilbertson	Fremont County School District #24
Noel Manning	Carbon County School District #2
Casey Tillard	Converse County School District #2
Jennifer Banks	Sublette County School District #9
Brent Notman	Converse County School District #1
Linda Crawford	Weston County School District #7
Dawn Solberg	Park County School District #6
Michele Sturdevant	Campbell County School District #1
Michael Daley	Sheridan County School District #1
Eugenia Farinha	Niobrara County School District #1
Melody Bergquist	Converse County School District #1
Audra Wood	Park County School District #6
Liz Edington	Laramie County School District #1
Zachary Schneider	Natrona County School District #1
Shane Ogden	Park County School District #16
Vickie L. Overcast	Washakie County School District #1